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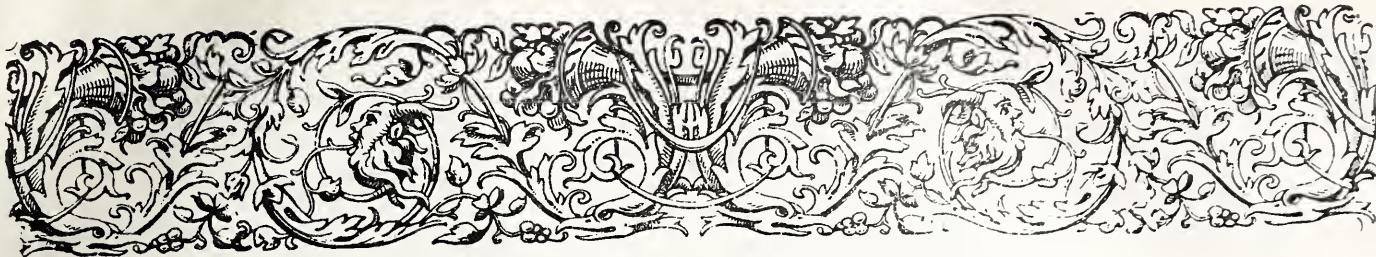
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EX CATHEDRÂ.

THE number of the Royal Photographic Society's Journal just issued contains the nomination form for the election of officers and Council, 1900. This form must be returned to the Secretary not later than January 19. It is understood that the Earl of Crawford will not stand for re-election as President. In October 1898, his Lordship only yielded to considerable pressure in accepting nomination to the office for the year 1899-1900, and on that occasion he said he was strongly of opinion that the Presidency should not be held for more than two years in succession by the same person. The members of the Society will therefore have to choose a successor to the gifted and amiable nobleman who for the last three years has filled the Presidential chair of the Royal Photographic Society with such remarkable success. Lord Crawford's term of office covers a notable period in the Society's history. The Incorporation; the Crystal Palace Exhibition; the removal to a permanent home in Russell-square are the three chief events that occurred during a presidency which has conferred very great benefits, indeed, on the Society and upon photography at large. Lord Crawford's disappearance as the official head of the chief photo-

graphic society in the world will be much regretted, but the recollection of his untiring and splendid devotion to its interests will, we are sure, long be held in grateful recollection by the members.

* * *

PRIVATE letters that we have received from him also inform us that Major-General Waterhouse does not propose accepting re-election as Honorary Secretary of the Society next month. Bronchial troubles are, we believe, the immediate cause of a decision which, in the interests of the Society, we hope General Waterhouse will find himself in a position to alter by the time the Council, a few weeks hence, takes in hand the matter of selecting an Honorary Secretary. Coupled with Lord Crawford's disappearance from the Presidency, General Waterhouse's relinquishment of the chief active control of the affairs of the Society at this moment would be very much regretted by those who are conscious that, in such distinguished hands, the Honorary Secretarship of the Society has a dignity quite in accordance with the best traditions of the office. It is no secret that various occurrences connected with the last Exhibition temporarily rendered General Waterhouse's position a somewhat troublesome one; but these things are not likely to suffer repetition, and we are firmly of opinion that, if General Waterhouse will consent to accept re-election as Honorary Secretary, he will secure the entire support of the members, who will heartily co-operate with him in making next autumn's first Exhibition at the New Gallery a very great success.

* * *

THE work of Vandyck is that which specially appeals to portrait photographers, inasmuch as it is mostly confined to portraiture and figure pictures. Unfortunately, however, our public art collections are by no means overstocked with examples of this great master's works. The majority of his best work is only to be found in private collections, which are not accessible to the general public. The Queen has between thirty and forty examples at Windsor, and others at Buckingham Palace. With these and others in various private collections, the photographic reproductions of some Continental firms, such as those of Hanfstaengl, Braun, and others, have made us somewhat familiar. Just now, at Burlington House, there is on view one

of the finest collections, obtained from various private galleries, including those of Her Majesty, of Vandyck's works that has ever been shown in this country. Those of our readers who desire to see the pictures should avail themselves of the opportunity, as a similar one may not occur again. It will also be an excellent opportunity of comparing the photographic reproductions, by the best houses, with the originals, and of seeing how the various colours are rendered in them.

* * *

A PARAGRAPH has been going the round which might almost be headed "spirit photography," and possibly will be so construed by some who are believers in it. The paragraph is to this effect: Lieut. Long, who was unfortunately killed in Lord Methuen's second battle, was some time before showing and explaining to a sister a new weapon; when it accidentally went off, killing her. After his departure for the seat of war, Lieut. Long wrote to another sister, presumably an amateur photographer, to take a photograph of the deceased's grave and send it out to him. When the negative was developed, it showed the grave with Lieut. Long standing beside it in uniform. The paragraph, to its credit, says that the explanation is that Miss Long took the photograph of the grave on an undeveloped plate, which had been previously used to photograph her brother himself. It also adds: "None the less, the coincidence is a remarkable one." The writer of the paragraph attributes the appearance of the secondary image to its true cause. Had he not done [so, probably those who believe in spiritualism and spirit photography would have assigned it to a totally different one, and some might have made capital out of it. Previously exposed plates are a stock in trade with charlatans in spirit photography, though little suspected by their dupes.

* * *

SOME little while ago the *Photo Chronik*, a German contemporary, published a process credited to Benham, and this has been reproduced here in abstract, and, in one of our contemporaries, described as a copper-sulphate process without any reference to its being our old friend the "chromatype" process of Hunt of half a century ago. Slightly modified, this further emphasises what we have frequently said before, namely, that it would be well for experimentalists and would-be inventors to overhaul many of the ancient processes, with our modern knowledge of photography and chemistry. The chromatype process of Hunt is this: The paper is brushed over with a solution of sulphate of copper and bichromate of potash, and dried. When printed, the image, which is brown, is further developed with a solution of nitrate of silver. In the "new" process the brown image is further developed in a strong solution of pyrogallic acid, the paper being sensitised exactly according to Hunt's method.

* * *

THE chromatype process of Hunt is an interesting one. Here is a quotation from his *Manual of Photography* (1854): "When exposed to sunshine, the first change is to a dull brown, and, if checked at this stage of the process, we get a negative picture; but, if the action of light is continued, the browning gives way, and we have a positive yellow picture on a white ground. In either case, if the paper, when removed from the sunshine, is washed over with a solution of nitrate of silver, a very beautiful positive picture results."

"To fix these pictures it is necessary to remove the nitrate of silver, which is done by washing in pure water; if the water contains any muriates, the picture suffers, and long soaking in such water obliterates it; or, if a few grains of common salt are added to the water, the apparent destruction is very rapid. The picture is, however, capable of restoration, all that is necessary being to expose it to sunshine for a quarter of an hour, when it revives; but, instead of being of a red colour, it becomes lilac." Mr. Bingham, at the time, found that, with the substitution of sulphate of nickel for the copper salt, the paper was more sensitive and the picture was clearer. These pictures can also be developed with nitrate of mercury. This process, as given in Hunt's *Manual*, is highly interesting in other ways, but space will not allow of further quotation here. Only a few weeks ago we alluded to a process that had recently been patented in America, which was identical with that published in Hunt's *Researches on Light* in 1854, and now we have another of these old and obsolete methods, with slight modification, reinvented.

* * *

WE congratulate Captain Abney on his promotion in the Order of the Bath, which was one of the New Year's Day honours gazetted on Monday last. He becomes K.C.B., and we are sure that photographers all the world over will join in felicitating the most distinguished of their number on the well-deserved honour that has been conferred upon him. *Apropos* of Sir W. de W. Abney's recent assumption of the principal directorate of science at South Kensington "F.R.A.S.," the learned and vigorous writer in the *English Mechanic* has the following eulogistic remarks: "Most happily for the nation, and for the dignity and purity of science generally—Sir John Donnelly is succeeded by as honourable and high-minded an English gentleman as himself. I mean, of course, Captain Abney, who may be most thoroughly trusted not to connive at the low arts and wiles of some of those whom he has been appointed to supervise."

* * *

A FINAL glance through the very great number of Christmas and New-year's cards that have reached us during the last ten days persuades us that the pretty custom of photographers making their own camera productions the principal features of those cards is, if anything, on the increase. To give our readers some idea of the variety of photographic Christmas and New-year's cards that we have received we select half a score for mention. One gentleman chooses a half-plate gelatino-chloride view of the French village in which he lives; another sends us capital quarter-plate photogravures from two of his own landscape negatives.

* * *

MR. GEORGE DAVISON pleasantly jogs our recollection of the '98 Salon Exhibition by sending us a picture on satin of his well-known study of a group of horses; and from Mr. Walter Barnett comes a costume portrait of a lady looking uncommonly like Mrs. Brown Potter. Amusing pictures of kittens were sent us by Mr. W. J. Croall, and a view of Dunbar by Mr. W. Crooke. The veteran Mr. James Alexander Forrest, who has not ceased to take a kindly interest in the JOURNAL and its conductors for the last forty-five years, is represented in our collection by a portrait of himself; and in the silhouette "photogram" of Mr. John Stuart, of Helensburgh, we recognise a perfect likeness of the genial President

of the Glasgow Convention. Mr. Vivian Hyde's card bore a print of one of his charming landscapes, and Mr. W. Thomas, faithful to his old love, the river, sends us a beautiful print of craft, *Waiting for the Wind*. Truly an agreeable and welcome collection of good photographs. We hope that the custom of exchanging photographic Christmas cards will spread amongst all classes of photographers; its capacity for causing pleasure to one's friends at the festive season has, we are convinced, not yet been fully appreciated.

OURSELVES.

THE controversy that is being carried on around the question as to whether the year that has just opened commences or ends a century does not invite our intervention; but, in either case, it supplies us with an opportunity for addressing to our readers a few words on the subject of our future relations towards them, and the many interests confided to our charge.

Those words shall be few and brief. Throughout its long and unchequered career, it has always been the aim of THE BRITISH JOURNAL OF PHOTOGRAPHY, by the aid of the experience and knowledge that has been continuously placed at its disposal, to discuss all phases of the science and practice of photography in a manner best calculated to be of advantage to its wide circle of readers and supporters. The fact that a vast number of the latter consists of professional men, whose business it is to furnish photographs to the general public, has ever been steadily kept in view, and will explain why many passing fads and crazes obviously incompatible with the everyday exigencies of practical work have received little encouragement in our pages. To the great interests of professional photography we shall continue to devote ourselves with the same thoroughness as in the past.

But THE BRITISH JOURNAL OF PHOTOGRAPHY is happy in addressing week by week many other sections of photographers besides the one just referred to. We have a world-wide amateur *clientèle*, as our subscription list and correspondence testify. There are classes specially interested in the optics and chemistry of photography; classes separately interested in the many scientific and industrial subdivisions of the main subject; in short, almost every single branch of photographic work constitutes a more or less distinct public of itself, into whose hands each issue of this JOURNAL regularly falls. The consciousness of the wide and varied public it is our happiness of constantly addressing will remain with us in the future as in the past, and it will be our endeavour to make our pages themselves the witness of the great pride and responsibility we feel in representing the best and most permanent interests of the photographic world.

When, in due course, the Jubilee of THE BRITISH JOURNAL OF PHOTOGRAPHY (which traces its date of origin back to the year 1854) comes to be written, it will be found that its history is very largely the history of photography itself for the last half-century. Leaving this task to the future, we will, however, allow ourselves to cast a glance back over the last decade or so, which is contemporaneous with our own intimate editorial connexion with the JOURNAL, and cull a few facts to support us in saying that, even beyond the immediate interests of its readers and supporters, the policy of THE BRITISH JOURNAL OF PHOTOGRAPHY has been directed towards promoting the advancement of the photographic world at large.

Founded by a former editor of the JOURNAL in 1886, that

pleasant and profitable annual gathering of photographers known as "The Convention," has always been steadily supported in these pages. In 1891-92 the early gelatine emulsion experiments of Dr. R. L. Maddox were brought prominently to notice in our pages, and on our initiative a sum of between 600*l.* and 700*l.* was raised and presented to him in recognition of the value of his discovery. The work of Messrs. Hurter & Driffield, long neglected or misunderstood by photographers, formed the subject of special study on our part some years ago, and we take pleasure in reflecting that it was to our efforts that the Progress Medal of the Royal Photographic Society was awarded to two of the most original workers and thinkers photography has so far produced.

Ever since the Photographic Copyright Union was formed we have done our best, in order to assist photographers in protecting their copyright interests, to forward the work of the Union. The part played by the JOURNAL in suggesting and supporting the great Crystal Palace Exhibition stands on our record. The work and writings of the founder and chief exponent of modern pictorial photography, Dr. P. H. Emerson, have been frequently brought to our notice, and the efforts of the JOURNAL have long been expended in securing recognition of one of the greatest intellects in photography.

The establishment of the Traill Taylor Memorial must be put to the credit of the JOURNAL and its supporters, and in more recent times we have interested ourselves in the attempt to persuade photographers to take up the use of metric weights and measures. Such institutions as the Benevolent Fund (now, alas, in process of extinction, through the apathy of those on whose behalf it was established) have ever received our sympathetic help.

We might extend the recital of the active part which the JOURNAL has always taken in stimulating photographic progress and activity; but sufficient has perhaps been said to assure its readers that the position which it admittedly occupies in the world's photographic journalism to-day is the result of the breadth of policy which has always directed it. That policy will animate us in the future, and the sphere of usefulness filled by the JOURNAL will, we hope, widen rather than diminish. To all sections of its supporters we address the assurance that no effort on our part will be relaxed to maintain THE BRITISH JOURNAL OF PHOTOGRAPHY in the proud position it has so long occupied.

Incandescent Lamps without Gas.—Many dwellers in the country who are debarred the luxury of gas will hail with pleasure the advent of a new lamp, capable of rivalling the incandescent gas burner but without the need for gas. Such a lamp has been devised by M. Denayrouze, and was recently exhibited before the French Society of Civil Engineers. The light of an ordinary fishtail burner is due to the incandescence of particles of carbon reduced from the coal gas by the act of combustion, and rendered white hot by the heat thereby evolved. According to Saint-Claire Deville, there is only about from three to six per cent. of carbon in coal gas, the surplus hydrogen being able to raise to white heat a far larger proportion than this if it were present. This fact is made use of in the Welsbach burner, which from a given amount of gas, produces about five times more illumination than if burnt in an ordinary fishtail or bat's-wing, or even an Argand burner. Many burners have been devised to cause an incandescent illumination from alcohol or petroleum, &c., as the combustible; but, so far, with little practical success. M. Denayrouze has hit upon a combination of the two systems. He uses alcohol to which a hydrocarbon has been added; in heating the mantle carbon is deposited

upon it, and along with the mantle itself is rendered incandescent, and thus a double source of light is provided. The lamp was a success, but the inventor kept to himself all details as to what form of carburetting agent was supplied. Still, it is probable that an invention of such value will be taken up by the manufacturers and placed upon the market, if in its present shape it is a really practical lamp.

An Electrical Lighter for Flash Lights.—The *Scientific American* describes a new method of igniting magnesium or other powders by means of electricity in the form of a simple apparatus manufactured by Messrs. Himmer & Potter, of New York. The motive idea is, from a double cell dry battery to provide a simple circuit passing through the flash powder, the current at that point passing through a small length of thin platinum wire. This, forming, when the current flows, a resistance, develops sufficient heat to become white hot, when, of course, the powder ignites. A simple means of making or breaking the current forms part of the apparatus, which, if well made, should be a very useful contrivance, as dry batteries easily rival the well-known Leclanché in their constant readiness for use.

Direct Photographs of the Moon over a Quarter of a Yard in Diameter.—Referring to the new long-focus telescope of the Harvard College Observatory, which is expected to be in actual use in a very short time, a small calculation will give some idea of its power. The object-glass will be a foot in diameter, with a focus of over a hundred feet. Taking the moon as, roundly, half a degree in diameter, we have 0'0039 (the sine of half a degree) multiplied by 100, equals 0'89 of a foot, *i.e.*, about ten inches as the size of the image on a negative without any previous amplification. It will be understood that this telescope is constructed specially for photo-astronomy.

A Marvellous Radiometer.—The anticipations once felt as to the probable use of the radiometer for photographic purposes were shown to be illusory, as it is the part of the spectrum which manifests heat rather than light which mainly actuates the vanes of the instrument. As proving this, there may be mentioned a marvellous little radiometer recently successfully tested at the Yerkes Observatory, for testing the heat radiated by stars. Obscure heat rays, as is well known, are entirely obstructed by glass, so that an ordinary radiometer placed at the focus of a refractor pointed to a star would not act simply because its walls are of glass, and the objective of the telescope of the same material, a double obstacle being thus interposed. The latter difficulty is surmounted by using a reflector (24 in. in diameter) to collect the rays, and the second by constructing the radiometer with a window of fluor spar let in, this substance being transparent to the least refrangible rays of the spectrum.

Sham X-ray Instrument.—In Boston there is being manufactured and sold an "X-ray camera" which is nothing but a fraud. The "camera," with pneumatic ball, is placed in position before a sitter in front of whose body is placed a sheet, apparently of white paper, without a mark upon it. Behind the body is placed a lamp. The exposure is made by pressing the ball. Gradually the paper loses its whiteness, the various organs of the body quickly depict themselves, first in faint colour, then almost immediately in brilliant reds for the lungs, a duller red for the heart, green for the stomach and intestines, and blue for the veins, other parts in black. This result, however, is only a trick. The white sheet of paper has previously been painted over with strong and diluted sulphocyanide solution, ferrocyanide solution, weak and strong, and finally with tannin, the details being supplied by an anatomical drawing, over which the thin paper is placed while the organs are being painted by the various solutions named. The squeezing of the bulb does not, as imagined, open the lens, it simply ejects an invisible spray of solution of ferric chloride from a concealed source upon the paper, the well-known reaction of this salt with the chemicals named producing these various colours. So long as it is understood to be a trick, the idea is

ingenious and amusing—so ingenious, indeed, that we shall be rather surprised if some unscrupulous inventor does not appropriate it to his own nefarious ends and bring out a new scheme for "photography in colours," the process being such as would lend itself admirably to the fraud.

THE PHOTOGRAPHER'S YEAR.

JANUARY.

THERE is no particular reason why the year should commence in January more than in February or March, nor that the good resolutions of various sorts generally made on the first of January should be made on that day more than on any other. There is no difference, beyond a slight astronomical one of length, which can have little to do with a successful holding to determined-upon changes for the better, between December 31 and January 1. But, as there must be a definite point to begin the year with somewhere, we may as well accept the present one without seeking any particular reason for its institution. The good resolutions, too, being in the main but expressions of the dismal reaction after the gaieties of Christmas, need not be worried much over, as they will so soon be broken. And wisely so probably, for, if a man held on to highflown plans often made at the beginning of the year, in the saving of money, reading more, eating less, not drinking at all, keeping a diary, and so on, he would soon become too perfect altogether for earth Whipt off to adorn a higher sphere, his virtues on a tombstone would be all left to us. Still, in moderation, a good resolution is a very desirable thing. The beginning of the year, too, is a reasonable point of time at which to make it, and as such offers perhaps something of adventitious aid in its keeping. The fault of most new-year resolutions of amendment is that they are too drastic. This is the direct cause of the majority being so short-lived. Those most likely to be kept are the ones that do not necessitate any awkward or marked departure from the ordinary course of living. Commonplace continuous efforts are far more likely to bring a reward than more spasmodic, though higher, ones. Lack of continuity means lack of sustained interest, and failure. To the furthering of continuity a plan is essential; not too rigid a one that the spirit would have the frequent opportunity of humanly rebelling against, but one that like a good wife would find its truest strength in a little elastic give at need.

Applying the foregoing general truths to the particular case of photography and the great mass of its non-professional followers, it will have to be admitted that one great source of the weakness of work lies in its scrappy nature. Excepting a very small minority of earnest workers in special directions in which they have excelled, a look through most stocks of negatives will readily prove the point. Not only does this scrappiness detract from the value of result, but also in its aimlessness from the pleasure of accomplishment. The remedy lies in working to a broad, reasonably definite plan. Individual temperaments varying so markedly, it's difficult to suggest one that would have a chance of acceptance by the majority. The suggestion is, however, made that this time framework of the year is one sufficiently elastic to be taken to fill up photographically. It will not be filled up alike by two workers, that is immaterial; but common to all who may elect to take it up will be the fact that photographs will be taken in every month to illustrate something in a continuous way to the forming of an organic whole. An album of such prints would be interesting at the end of a single year, valuable at the end of three or four, invaluable at the end of twenty. It would form a pictorial account of one's life for its term, truer, more easily consulted, and infinitely more interesting than a diary. Or, as a record of mood, imagine a diary supplemented by such a album! But this is rising to heights of grandeur inaccessible to ordinary minds, with which as forming one we are most in sympathy.

But what can one do photographically in many portions of the year? may be asked. What is there worth photographing, for instance, in this and the next two months? More than one would think until he comes to look more closely at things. And not the least of the advantages of acting upon the suggestion would be the noting of a vast amount of hitherto unnoticed and unsuspected features peculiar to each month, and the differences between those of one month and the other. We do not mean to say that January is so rich in photographic possibilities as June. The pictures of the former need not be so numerous as those of the latter, and even thus in a mere matter of numbers our comparative appreciation of the two be shown. But working to the filling in of a plan can do much more. The best part of human pleasure lies in its anticipation, or in looking back upon it when it has passed. The re-

membrances of summer scenes and out-of door enjoyments are extremely pleasant when looked back upon, or forward to again at the winter fireside ; those of winter equally so when tired with excess of heat and sunshine, as was the case markedly enough during this last summer. Our photographer has the added zest and emphasis given by turning over his year-book of pictures.

As there are wheels within wheels in the making of a piece of mechanism of high value, so, within the loose binding of this plan based upon time and season, there may be a more definite one making for a special purpose. A square of carpet looks better and is more serviceable than scraps of rug thrown here and there upon the floor of a room ; but the square of carpet is in turn much heightened in estimation and beauty by having a suitable pattern woven into it. So, with the photographic worker, a particular object within the year's bounds will make his work more valuable. What form it may take depends upon his individual tastes and leanings. It may be that of picturing a year's sport, the appearance of a favourite walk, the garden or farmstead for a year. Dwellers on the seashore are specially blessed in having the infinite variety of the sea, and those finding a living in and upon it, to picture throughout a year's moods. To the interested eye, soon becoming an acutely discerning one, there is a wealth of material both landward and seaward in our beautiful England, with its so frequently changing weather conditions.

Presuming that enough has been said in broad, general support of the idea, a few suggestions each month as to satisfactory methods of carrying it out may prove interesting. The town-dweller will have very different aspects presented to him in January to the country one. With respect to the characteristic one of snow, it looks very different in the country to the town—at least, after the first day or two. A country road, with its sparing traffic, and the clear indications of its kind and purpose in wheel and footmarks, tracks leading off along a side lane or towards a solitary cottage, bordering burdened trees and hedges, are very different features to those of the town street with its slush, and the corporation carts and men hard at work clearing it away. Both are pictures worth catching ; both would be prized six months hence, when the thought of snow will be so much out of the current order of things ; or, if the town-dweller be of too delicate an artistic fibre to see much worth preserving as a record in a sloppy street, in all towns there are delightful little bits of quaint roofs and gables that can be caught when the snow is fresh. In many towns the luxury of rich tracery of church or cathedral walls, windows, spires, turrets, are improved yet further in beauty by a dusting of white—such pictures are ones generally enjoyed more in the abstract, though, for, although desired in a vaguely artistic way, the conditions under which they must be taken are not the best photographically more than the pleasantest physically. The same cold that brings the snow makes the warmth and comfort of the fireside so much the more acceptable and attractive. Carrying a camera about and fingering screws on a frosty morning are not generally looked upon as pleasures ; but the result is well worth the trouble, and appreciated all the more highly from the difficulties and unpleasantness in obtaining it.

There are too, in January, peculiar effects of sunlight breaking through dominating grey clouds that are not to be seen at any other time of the year. Golden light we are apt to associate exclusively with later summer and autumn, and correctly so in its mellowness ; but there is often a rich, clear gold, especially when thrown upon distant water, in January, that we fail to see at any other time. This is certainly exceptional, and it might, perhaps, be better upon the whole to take characteristic features. Grey, bare dulness is the dominant note of the month, to be caught as such if a true picture is what is aimed for—not so easy a matter as it looks, for the standards to judge by, both on the artistic and technical sides, are so different in every way to the orthodox ones we have unconsciously formed under the usual conditions of summer work.

What objects or scenes are to be taken under the prevailing dense light or coating of snow rests with the individual taste. There is no lack of choice ; it is the same earth, under different conditions, as the summer one. Snow scenes, bare stretches of country roads, gaunt tree forms, naked copse, skating and hunting scenes, cosy interiors, and so on, offer an ample and a varied field from which at least half a dozen pictures can be picked to be placed in the first section of the year's work.

BRITISH PHOTOGRAPHY FROM THE AMERICAN POINT OF VIEW.

By the last batch of our Transatlantic exchanges we observe that British photography, especially the "pictorial" section of it, has recently attracted the close critical attention of some of our photo-

graphic brethren on the other side. Thus, Mr. F. Dundas Todd (formerly of Edinburgh and now editor of the *Photo-Beacon*, Chicago) delivers himself of the following emphatically unfavourable opinions. We take the extract from a review of *Photograms of the Year*, and it will be observed that the writer is no more complimentary to the New York amateur than he is to the British professional :—

There are one or two rather amusing features in the book, however, especially with reference to American work. The writer of the article on "The American School" is a New Yorker and an amateur photographer, therefore there is a whole lot he does not know, and he is not aware of the extent of his ignorance. He deplores, first, that there is no strictly American school of photographic art, and, in the second place, sees a little hint of the dawn coming, and gives credit for that little ray of hope to a photographic publication issued to a select few once a quarter. We live in Chicago, in the "Wild and Woolly West," where men's minds are given up to the making of pork and the handling of grain, therefore there is no art in this benighted spot. So thinks our Eastern friend, who believes he sees it all because, forsooth, he lives in New York. May we tell him that there is an American school of photographic art, distinctly its own in style, and that—horror of horrors!—it is to be found in professional photography? We have gone carefully through the *Photograms* of 1899, examined every portrait therein, and have no hesitation in saying there is not one really good specimen of portraiture in the whole book, according to the American ideals of the last three years. Nay, more, but yesterday we had a call from a photographer in a small town in the Middle States, a man who but five years ago was a farmer, and we placed in his hand some portraits made by one who is in every one's mouth in Britain as an artistic professional photographer. He looked through them, and passed them back with the remark, "Who made that ordinary stuff? He must have been asleep for a few years." Long before *Camera Notes* was ever dreamed of, James Inglis and the writer were stirring things up considerably, and to-day these two men can walk into any photographic convention, claim a part interest in practically every picture hung on the walls, and, what is more, have it accorded them with a smile. So this new American school is a Western product, not an Eastern ; is distinctly American by birth, and not European. The American to-day is an originator, not a copier, and the sooner the folk who live at the jumping-on place look across the prairie and turn their back on the sea the more chance there will be for them to see something.

At the recent Exhibition of the Philadelphia Photographic Salon, British pictorial photography was largely represented. In the pages of the *Photo Era*, Mr. Joseph Prince Loud, who is President of the Boston Camera Club, makes the following comparisons between American and English work :—

English photographers have for so many years been recognised as leaders in their art that it is now most gratifying to find that the average American work here exhibited can be compared most favourably, while in individual cases it is equal, if not superior, to theirs.

The English pictures are all more distinctly exhibition works, and, having greater carrying capacity, are therefore more impressive to the casual observer.

There is, however, a greater monotony of style than in the American pictures ; which effect is further increased by the similarity of framing, due to the rule of foreign exhibitions, which prohibits the use of mats in the requirement of close frames.

In a degree the same national characteristics of style are apparent which exist in the two distinct schools of painting. The English work, while more finished, often has the effect of being over-studied ; while the American work is generally broader and more imaginative in style, or, to use a painter's phrase, more sketchy in treatment.

The English pictures almost invariably impress one with their wealth of detail, which, in a measure, may be due to a desire to truthfully portray their more picturesque surroundings. In comparison the American pictures have a far greater individuality. The compositions are usually more simple, and are more dependent upon their tone and colour values, in which there is often a tendency to go to the other extreme of barrenness in detail, in order to gain effect by strong contrasts of light and shade.

The American simplicity of taste is strongly shown in the method of framing, which, when mats are not used, have generally the plainest of broad, flat mouldings. In contrast, the English pictures, with few exceptions, have rather heavy frames, with inside gilt edgings, and are moulded with cuttings often so deep and complicated that one with difficulty forgets the frame long enough to enjoy the picture within.

Among the exceptions to be noted are the pictures of J. Craig Annan and Ralph W. Robinson, which are framed with as good taste as their compositions are simple and effective.

Of the English exhibitors, the work of the two artists above mentioned is the most individual in treatment, and their pictures undoubtedly rank among the best in the entire Exhibition. Mr. Annan's work is always original. His portraits of James Guthrie, Esq., and Miss Ellen Terry are exceptionally fine, as is also his *Lombardy Ploughing Team*, which is treated in a charming decorative style. Mr. Robinson's landscapes are of his best work, and are exceedingly strong pictures. His portrait, the *Head of a Girl*, is also particularly fine.

The work of A. Horsley Hinton is, perhaps, as familiar to Americans as that of any foreign artist, through its frequent reproductions in our photographic publications. His seven landscapes exhibited are characteristic, and are wonderful pictures, especially *The Headland*. His work shows less variety than that of almost any other artist, which is particularly noticeable here, where in each case the composition is divided horizontally in the middle by the sky line. The prominent features of his pictures are the foregrounds, which are selected with great care, the sharply defined middle distance, and the strong skies, which are never subordinated. His clouds are generally heavy, yet truthful, and thrust themselves into the landscape as only the English atmosphere can. That he is a keen student of nature is apparent in all his work.

Landscape photography seems to be the strongest forte of the greater number of English artists, among whom W. Smedley Aston, Karl Greger, and W. Thomas show some very excellent examples.

In portraiture, most of the English work is rather conventional in style, the pictures of Harold Baker, H. Walter Barnett, and Frederick H. Evans being of chief interest. William Crooke also shows some clever portraits, but the extent to which he has undertaken in some of his work to imitate old engravings, even in the framing and quaint margin lettering, is certainly questionable photographic art. The resemblance is so perfect that the results appear simply as photographic copies.

Collectively, the French photographs have more of the characteristics of the American rather than the English work in their greater individuality and broader treatment.

A second criticism of the Philadelphia Salon appears in the *American Amateur*. It is by Mr. C. R. Pancoast, who says that, in portraiture, William Crooke, of Edinburgh, stands alone. "It is simply a triumph of photographic art, and his pictures are by all odds the finest portraits in the Salon."

Mr. J. Craig Annan's seven pictures are all up to his high standard. It is seldom that one meets a more satisfactory photograph than his *Lombardy Plowing Team* (No. 14). A Rosa Bonheur could do no better. Among other works of note may be mentioned *Grey Avons Peace* (No. 25), by Harold Baker; *Reedy Wastes* (No. 18), by W. Smedley Aston; *Dreamy Marshland* (No. 146) and *Evening Before the Day of Rest* (No. 149), by Karl Greger. *The Storm Lifting* (No. 167), by Charles F. Inston, is one of those superb effects where everything combines to make a wonderful result. The effect of the light on the water, the lugger under reefed canvas against a background of storm clouds, completes a happy combination rarely met with. Will Cadby is guilty of perpetrating a fake in his *There Came a Big Spider* (No. 73). The idea of a nude female figure sitting on a stone wall in close proximity to a *toy spider* of mammoth proportions is, to say the least, ludicrous. That the talent of the father has descended to the son is marked in the work of Mr. Ralph W. Robinson. His *Becalmed* (No. 251) is a gem. The broad expanse of water, the idle sails, all tell the story. The exhibit of Mr. Robert Demachy, of Paris, is especially interesting and very beautiful, as showing the great capabilities of the gum-bichromate process, of which he is evidently a master. His pictures do not bear reproduction, and one must see the originals to appreciate the subtle effects he strives for. *A Group of Cattle* (No. 56), by Maurice Bucquet (Paris), is a wonderful piece of photography, as showing the effect of motion without the rigidity so often seen in effects of this kind, where the exposure has been too brief. His *Open Sea* (No. 57) is a clever marine.

P.O.P. MANIPULATION.

GELATINO-CHLORIDE printing-out-paper, or, as it is technically called, P.O.P., is probably at the present time the most popular and most generally used of the printing-out papers, which makes it more difficult to understand why such a number of people are still unable to work it properly, or to get anything like the best results from it; about ninety per

cent. of this is the fault of the operators themselves, the other ten per cent. we may perhaps put down to the paper, although this is rather a liberal estimate.

We hear complaints of yellow prints, marks in the prints, double tones, tackiness, &c. Taking the minority first, i.e., faults from bad paper, what do we find? Seldom that it is the fault of the manufacturer, but rather that of the dealer, or perhaps, more properly, the fault of the dealer not having a sufficiently quick sale for the paper. This is a matter which is very difficult to overcome, as the dealer has to cater for a casual as well as a regular trade, and, if he has not a sufficient stock of paper in hand when his customers want it, they go elsewhere, and very often this loss is not merely temporary, but permanent, so he always stocks more than he expects to sell; consequently, although P.O.P., if properly prepared, is by far the best keeping of all the printing-out-papers, it deteriorates and becomes discoloured, and, no matter how carefully worked, the best results can never be obtained upon it. Unless a dealer's business is carelessly worked, paper should never be kept so long a time that this deterioration becomes serious, as P.O.P. ought to keep in good condition for six months at least, although, of course, the very best results can only be obtained when the paper is fresh. In buying from a dealer there are two chances of the paper being old, as it may have been some little time in stock at the factory besides the time the dealer has it. Most professionals who study their business order direct from the manufacturers; this, undoubtedly, is the best way, despite the fact that in small quantities it is slightly more trouble and expense at starting, though often this is compensated for by the saving of time in working. I believe the manufacturers do not now supply paper quite freshly coated, as, being more sensitive, it is more likely to spoil in the hands of careless workers, who, unfortunately, seem to predominate. To the average amateur the dealer is almost indispensable, as often their orders do not extend to more than one packet, and the trouble and expense of getting this from the manufacturers greatly discount the advantages gained; besides, the amateur is only able to print in spare time; consequently, should he not get the paper just when he wants it, possibly he may have no use for it until some time afterwards, thus losing any advantage gained.

Long-kept paper will account for some yellow prints, but very often carelessness in toning and fixing accounts for a lot more. Unless the combined bath is used, and no photographer who wants good and permanent prints should ever use it, the paper must be well washed before toning. The importance of this washing does not seem to be generally understood. P.O.P. contains a lot of salts which are not required in the finished print, and, unless these are washed away, they get into the toning bath and spoil it, therefore the prints do not get properly toned. Some of these salts are very soluble in cold water; thus the preliminary washing eradicates them, and saves further trouble.

Several of the manufacturers say in their instructions that, after taking the prints from the printing frame, they may be placed in a weak solution of common salt (chloride of sodium) and water, but also say this bath may be omitted if desired, which is very vague, and many photographers do not understand the reason for this bath, which is really a very important one. The chloride of sodium converts the organic salts (usually citrates and tartrates) contained in the film into chloride of silver, and in turn forms citrates and tartrates of sodium. This makes the washing before toning more simple and thorough, as silver citrate and tartrate are not very soluble in cold water, while sodium citrate and tartrate are very soluble, consequently the washing easily removes them. In addition to this, the salt bath gives the prints a redder tinge, and a greater range of tone, with very much better results, can then be obtained. A five per cent. solution should be used. The prints must be well washed after the salt bath.

Most manufacturers say that any toning bath may be used to tone P.O.P. This is quite correct up to a certain point, but, if the best tones are required, only the sulphocyanide bath should be used, for, as explained in an article entitled "Toning Troubles," which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY of July 21, 1899, under many circumstances gold, like silver, combines with gelatine and robs the toning bath. The sulphocyanide obviates this, therefore better tones can be obtained. Sulphocyanide also has a bleaching effect upon P.O.P., tending to give purer whites, and it also has a slight fixing action.

Many complaints are made that P.O.P. uses a very large quantity of gold in toning, more than either collodio-chloride or albumen; but this is remedied by using the sulphocyanide bath, for, although gold chloride does combine with gelatine, gold sulphocyanide does not, thereby accounting for the superiority of the sulphocyanide bath; consequently, if photographers will insist on using other baths, they must be prepared to allow an extra quantity of gold, besides risking uncertain and double toning.

An interesting experiment in toning is to place one or two P.O.P. prints in the same toning bath with some collodio-chloride, when it will be found that the P.O.P. prints will tone until all the gold is exhausted, while the collodio-chloride prints will hardly tone at all. This is probably accounted for by reason of the great affinity which gelatine has for gold.

Double toning, which seems to be one of the principal, if not the principal, troubles that many photographers have with P.O.P., is sometimes caused by a toning bath too strong in gold, which then deposits

unevenly. The writer believes that the following toning bath will be found quite strong enough for any P.O.P.:-

Ammonium sulphocyanide	15 grains.
Gold chloride	$\frac{1}{4}$ "
Distilled water.....	8 fluid ounces,

and, if used at this strength, little trouble should be found with double toning. Certainly it will not tone so quickly as a stronger bath, nor will it give such violet-blue tones as these can only be obtained by a bath which deposits gold quickly, but few prints should be spoiled by the above. This bath is easily and quickly made if stock solutions of the gold and sulphocyanide are kept. The gold is generally bought in tubes containing 15 grains, and, if the contents of this tube are dissolved in $\frac{1}{2}$ fluid ounces of distilled water, each drachm of the solution contains $\frac{1}{4}$ grains of gold, and, if to every 180 grains of ammonium sulphocyanide $\frac{1}{2}$ ounces of distilled water are added, each drachm of this solution contains 15 grains of sulphocyanide; so, by taking 1 drachm of each stock solution and adding to 8 fluid ounces of distilled water, the bath is made at a cost of very little time and trouble. The writer strongly advises photographers to use nothing but distilled water for making up stock toning solutions and toning baths, as time, trouble, and money are thereby saved. Add the sulphocyanide to the water first, and pour the gold into it. *On no account reverse this order.* On first adding the gold, a red colouration is imparted to the solution, which, however, quickly disappears. Ammonium sulphocyanide should always be dissolved directly it is purchased, as it is very deliquescent, the same remark applying to gold chloride, the tube containing which should be broken into the water. In toning with the sulphocyanide bath, on first immersing the prints they lose density to a very large extent, and turn a peculiar yellow colour, which should then steadily change to the proper tone if the bath is in good working order. The writer has known amateurs to think their prints spoilt at this first loss of density.

It is often desired to harden the surface of P.O.P., and many prefer to do this before toning and fixing, especially if the weather be very hot. Still, even in the hottest weather, unless the toning room is much exposed to the sun's rays and gets very hot, it should not affect the toning and fixing baths sufficiently to make trouble with the film. In exceptional cases, where the heat of the sun brings the temperature of the toning room up to 80° F., and the baths have been standing in the room some time, and nearly, if not quite, reached the same temperature, trouble is sure to be experienced; but this may be averted by standing the dishes in a cold-water bath. Ordinary tap water seldom reaches a higher temperature than 65° F., even in the hottest weather, and any P.O.P. should be safely worked at this temperature. In fact, it is about the best at which it can be worked; so, if the toning and fixing baths stand in another dish of water at this temperature, all trouble should be avoided without hardening the film, which the writer believes is a bad practice before toning and fixing. Should it be decided to harden the film, a solution of either chrome alum, potash alum, or formalin, may be used. Chrome alum is a very good agent as far as the actual hardening goes, but it is liable to give a greenish tinge to the prints, besides which it is a compound of sulphur, as its formula, $Al_2Cr_2SO_4 + 24H_2O$, shows. The latter is also a fault in common or potash alum, which is probably the most generally used of all the hardening agents where the Cr_2 is replaced by K_2 . The alums are generally used in a five per cent. solution, and, if thoroughly washed away afterwards, probably no harm results, as the writer is of opinion that the Al and Cr are the principal factors in hardening. Still, he believes that a good deal of the yellowness complained of in P.O.P. prints could be largely traced to an improper use of alum. The writer prefers to use a four per cent. solution of formalin for hardening the film, as it has none of the disadvantages of the alums. Formalin is usually obtained commercially as a forty per cent. solution. Hardening done after toning and fixing is an advantage, as all the three hardening agents mentioned above act as antiseptics to gelatine, and thus tend to preserve it, but, being used before the prints are finished, helps to lock up the silver salts in the film, and it is doubtful if the proper effect of toning and fixing is produced.

In several of the manufacturers' instructions it is stated that P.O.P. may be worked the same as albumen, and in many respects this is true; but it should be remembered that each variety of printing-out paper, whether collodion, gelatine, or albumen, has its own peculiar properties and characteristics, and upon no other paper can the rich velvety tones be obtained such as are produced upon P.O.P.

An item requiring attention is the washing between toning and fixing. A good deal of the chloride of gold obtained commercially is strongly acid, sufficiently so to make solutions prepared with it also acid, and, although it does not seem to affect the toning of P.O.P. in the same way that the toning of collodio-chloride is affected, taking P.O.P. prints straight from an acid toning bath and immersing them in hypo causes a deposition of sulphur upon them, and, although there are some photographers willing and ready to try and prove, with an ingenuity worthy of a better cause, that sulphur toning is permanent, it has been well established for many years that the exact opposite is the case, added to which is the fact that some of the yellow prints may be traced to this cause.

There is often a very false economy practised in fixing. Some photo-

graphers, both amateur and professional, seem to try and make a "record" of how many prints it is possible to fix (not necessarily properly and permanently) in one pound of hypo. At the present time hypo is remarkably cheap, and such a niggardly use of it is neither necessary nor wise, as hypo forms two compounds with silver, one soluble, the other insoluble. The soluble one is formed with a strong solution of hypo, while the insoluble one is formed by a weak solution; therefore, if fixing is started with a weak solution, as each print is fixed the solution gets weaker still, until at last it merely forms an insoluble compound with the silver in the paper, and no amount of washing will remove this, consequently the print fades and discolours, and the blame is thrown upon the P.O.P., which is immediately pronounced no good. The fixing bath is safest when used at a strength of

Hyposulphite of sodium	3 ounces,
Water	1 pint.

This leaves a fair margin of hypo over what is absolutely necessary, ensuring the safety of the prints. Enough should be used to just cover the prints well. The immersion should last about fifteen minutes, when the hypo should be discarded.

One of the greatest advantages about P.O.P. is the ease with which almost any surface is obtained upon it. Taking the ordinary glossy paper after it is toned and fixed, we can either take it straight from the final washing water, and mount it as it is, or, if a glazed surface is required, merely thoroughly clean, and either French chalk or wax a polished glass or ferrotype plate. Take the print from the wash water, and squeegee into close contact, making sure that no air bubbles are in between the glass plate and the print, or dull spots will be left where each air bubble is. Should a matt surface be desired, substitute a ground-glass plate for the polished one, and proceed as before, when a very effective matt surface is obtained, combining many of the advantages of a glazed surface without the loss of detail and depth which often occurs with commercial matt paper.

No difficulty whatever need be experienced in getting the print away from the plate if the latter is clean, a careful raising of one corner with a knife blade usually effecting this if the print is dry, but no amount of care will get the latter away without injury if the plate is not properly clean. The print should leave the plate directly the corner is raised. If it does not do so, allow a further time for drying, and when again tried, and the print still refuses to come away, immerse plate and print bodily in water until they separate, clean the glass, squeegee again, and no difficulty should afterwards be experienced. Although this is the easiest way to glaze P.O.P., undoubtedly the best and most permanent method is to coat a glass plate with collodion. Immerse P.O.P. print in a weak and not too hot solution of gelatine, and then squeegee on to collodionised plate, when the collodion film may be easily stripped from the glass if clean; and, as collodion is not affected by moisture, the gloss is permanent. When these methods are adopted, it is advisable to put a backing to the print while on the plate, or in the former case the surface may be spoiled.

The question of a mountant is a very important one with P. O. P., as unless carefully used, any mountant where water is the solvent is likely to cause trouble; stiff starch paste is as good as anything if carefully applied, but perhaps the safest kinds are the alcoholic mountants, as these scarcely affect the gelatine, which, of course, is easily acted upon by mountants containing water. Very good mountants can be made by a saturated solution of shellac or any of the gum resins, such as copal, mastic, elemi, &c., in alcohol.

Sufficient care is not always displayed in storing P.O.P., which should never be kept near the ceiling in a room where gas is burnt, as the fumes will spoil it, as will the fumes from chemicals; the safest plan is to store it in a box by itself, where no fumes of any kind can penetrate. A good deal of trouble was caused recently where P. O. P. had been stored in a cupboard, and, a large quantity of hypo used and kept close to the outside of one wall, the hypo gradually penetrated the wall and spoilt the paper. In handling P. O. P., remember that the film is delicate, and finger nails will scratch it, while dirty chemical-stained hands are fatal to good prints, leaving them covered with red marks and lines. There should be no more difficulty in working P. O. P. than in working albumen if proper care is taken, but, if (as sometimes happens) the prints are shot into the toning baths like rubbish into a hole, it is small matter for wonder when many prints are spoilt, and P. O. P. gets blamed for the carelessness of the operator.

C. T. SUTTON.

A PHOTOGRAPHER'S CHRISTMAS ENTERTAINMENT.

By invitation of Mr. and Mrs. Albert Young, a most enjoyable Christmas entertainment was given on the 28th ult. to the staffs of Messrs. Fradelle & Young's Studios and Works.

Unfortunately, some were prevented by prior engagements from being present, but nearly thirty members met at the chief studio, at 283, Regent-street, and spent such a merry time that it was long in the small hours of the morning before the party broke up.

The gathering was also a "send-off" to Mr. A. Wheeler, who was leaving on the following morning to represent the firm on a journey to

N. Africa, Palestine, and Egypt. Mr. Wheeler is a favourite with all, and had a fine reception for his songs.

Mr. Delaney, who had only recently returned from a long journey through Norway, on behalf of Messrs. Fradelle & Young, was also present and gave a song with a rousing chorus, whilst suitable words, expressing the pleasure of being present, were spoken by Misses K. & M. Young, Miss Harrington, Miss Pearce, Miss Winter, Miss Hammond, Mrs. Webb, Misses G. & E. Webb, Miss Elizabeth Hogger, and the lads Rouse, Thoene, and Michaels.

Miss Shipman amused the company with some very funny recitations; Mr. Groves gave a soldier's song; Mr. Constable not only entertained every one with his cornet, but gave a most excellent vocal rendering of "The Absent-minded Beggar;" Mr. Frank Santiero astonished all by proving himself the possessor of a most melodious voice, whilst Mr. Hutchins gave evidence of his powers as a most excellent reciter (with suitable action) of long and difficult pieces, and Gerald Morrison also cleverly recited.

The "Edison-Bell" Phonograph, which Mr. Young daily uses for the dictation of his correspondence, was pressed into the service, for this night, as a recorder of every item of the programme, and, after an interval for the display of some remarkably fine animated photographs, great amusement was caused by the repetition the phonograph gave of all the earlier portion of the evening's entertainment.

Mr. Eckhardt and Mr. Bacon came as the representatives of past members of the staff, and gave much pleasure by whistling and vocal solos. They were accompanied by their wives, who most kindly assisted in many ways to the pleasure of the company.

Many other members contributed to the mutual enjoyment, and before leaving all were presented with suitably framed portraits of Mr. and Mrs. Young.

This most enjoyable meeting was brought to a close by the health of Mr. and Mrs. Young, and little baby Franklin Young, being most enthusiastically drunk, and the expressions of hearty goodwill.

ON THE ACTION OF LIGHT ON THE SALTS OF COBALT.

PART VII.—EXPERIMENTS WITH COBALYTIC HYPOPHOSPHITE.

THIS compound was prepared by double decomposition, a mixed sensitising solution of cobaltic oxalate and potassium hypophosphite being employed for the purpose. Paper having been sensitised and dried as usual, several strips thereof were successively exposed to the action of the solar spectrum.

In the first of these experiments an exposure of forty hours was given. On removing the strip for examination no image was perceptible, and it was accordingly transferred to the usual neutral ferricyanide bath. The progress of development was extremely slow, and at first no change in the appearance of the strip could be detected. Ultimately, however, a very feeble rose-pink image was obtained, consisting only of an extremely faint band in the region of the yellow rays, and a second and feebler band in that of the indigo rays—this latter being, however, so excessively feeble as to raise a doubt whether it were fairly entitled to be regarded as a portion of the image. The next strip was exposed to light in the spectrum slide for 100 hours. No change of appearance could be

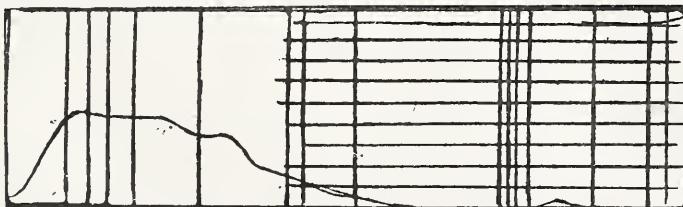


Fig. 23.—COBALYTIC HYPOPHOSPHITE.

detected on examination after exposure. On attempting to develop it in the ferricyanide bath, it persistently retained its original greenish-white colour, and, although many minutes were suffered to elapse before the print was removed from the developer, no indications of an image could be traced at any stage of the operations. Here, evidently, was a fresh instance of that phenomenon characteristic of so many of the cobaltic salts, viz., the bleaching of the primary image under the influence of light. In addition to this, however, the experiment served to demonstrate what hitherto had not been clearly established, namely, the fact that the bleaching action, called into operation where there is a visible image to attack, is capable of manifesting itself under other and different conditions, i.e., in the presence of the latent image, and, as before, of undoing the work performed in the initial stages of the exposure to light.

A third strip of the sensitised paper, which also had been exposed in the spectrum slide for 100 hours, was developed in a bath containing a very weak aqueous solution of argentic nitrate.

Owing to the slowness of the action of the developer, upwards of an hour's immersion in this bath was found necessary to produce a print of a density sufficient to represent with accuracy the action of the rays operative in producing the image. Notwithstanding the care bestowed

on the print, the black deposit of metallic silver representing the image was somewhat feeble in regard to depth and vigour, even at the less refrangible end, where the action of the light had been most intense; whilst at the violet end it was represented by a mere tint, scarcely perceptible to the eye.

It was, however, found possible to assign approximate numerical values to the several groups of rays represented in the print; and in fig. 23, accompanying this article, an attempt has been made to reproduce its leading features.

The remarkable fact will be noticed that the action is due, not to the more, but to the less refrangible rays, it being almost wholly attributable to the red rays and those lying in their immediate neighbourhood. The maximum point is situated in the red, but both the orange and the yellow rays exercise a pretty strong influence. The falling-off in intensity in the region of the green is very marked, and beyond, if we except the inappreciable and doubtful band in the indigo, there is no further chemical action.

EXPERIMENTS WITH COBALYTIC CARBONATE.

This salt, so far as can be judged from the somewhat limited data cited below, does not appear to be readily affected by exposure to light.

The earlier experiments of the series were made on paper which had been sensitised with a solution of cobaltic citrate, dried, and resensitised with a strong solution of sodium carbonate.

A number of pieces of this paper were exposed in succession under a negative in bright sunshine, the exposures ranging from one hour to two hours in duration. Four different developing solutions were employed, namely, (1) an ammoniacal solution of disodic orthophosphate; (2) an alcoholic solution of gallic acid; (3) an aqueous solution of tannic acid; (4) a very weak aqueous solution of potassium permanganate. An exposed strip was immersed in each bath, with the following results:—

- (1.) The phosphate bath failed to produce any change that could be identified as an image.
- (2.) The gallic acid bath stained the paper violet, the coloured deposit being, however, of a perfectly uniform character.
- (3.) The tannic acid bath produced an equally uniform deposit of a reddish-brown colour.
- (4.) The permanganate bath stained the paper a sepia brown, the deposit exhibiting certain slight variations in intensity which might be due to development, but which, with a greater measure of probability, were attributed to the presence of inequalities in the texture of the paper.

On developing a second strip in the gallic acid bath, it was thought that similar doubtful traces of an image in violet could be discerned, but in all likelihood these were also due to a physical rather than to a chemical cause.

The presence of the citrate along with the carbonate in the sensitised paper being considered undesirable, an attempt was made to prepare a solution of the carbonate by other means. For this purpose freshly precipitated zinc carbonate was dissolved in a concentrated aqueous solution of ammonium carbonate, any insoluble residue being carefully filtered off.

A solution of cobaltic oxalate was then added in the proportions necessary to effect the precipitation of the zinc in the state of oxalate. The mixed solutions having been allowed to stand until all the insoluble oxalate was deposited, the pale, bluish-green liquid was decanted off, and applied to the surface of the paper to be sensitised. This, when dry, was exposed to the light of the spectrum for forty-five hours. No image was, however, obtained, and the exposed strip was accordingly transferred to the usual ferricyanide bath. With the exception of an extremely doubtful indication of a band in the blue, no change ensued in the appearance of the paper during development, nor, on extending the period of immersion in the bath, was any more conclusive evidence of spectral action forthcoming.

EXPERIMENTS WITH COBALYTIC ANTIMONIATE.

Paper was sensitised with a concentrated solution containing a mixture of cobaltic oxalate and potassium antimoniate, the latter salt being in excess. When dry, it was exposed to light beneath a negative, but

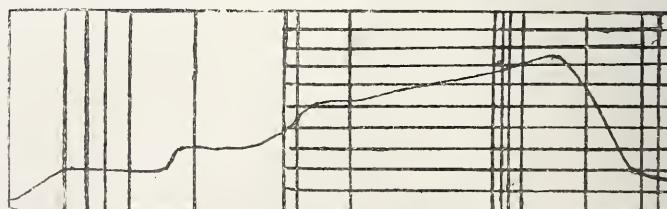


Fig. 24.—COBALYTIC ANTIMONIATE.

without perceptible result, an exposure of 100 hours in diffused light effecting no alteration.

A strip of the prepared paper was then exposed to the action of the spectrum for a like period. As before, no image was produced. That a latent image had nevertheless been formed was proved on immersing the

exposed paper in the ferricyanide bath. When thus treated, it instantly assumed a rich purple colour, especially intense towards the more refrangible end of the spectrum, where evidently the chief action had taken place. In fig. 24 a reproduction is given of the print in question. The actinic action, as here exhibited, is strong in the blue, and attains a maximum in the indigo. The violet rays, however, it is curious to note, produce very little effect, in this respect resembling the red and the orange, these three sets of rays representing the minima in the diagram. The influence exercised by the green rays, on the other hand, is only a little inferior to that of the blue. Lastly, the yellow rays occupy a place, in regard to intensity, intermediate between the green and the less refrangible portion of the orange.

EXPERIMENTS WITH COBALТИC METANTIMONIATE.

A concentrated solution of potassium metantimoniate having been substituted for the antimoniate in the mixed bath of the preceding experiments, paper was again sensitised and dried in darkness.

Two pieces were successively exposed to light for 100 hours, the first under a negative and the second in the spectrum slide. In neither case did any image result. On developing the second strip in the ferricyanide bath, in the course of about ten minutes a dark band appeared, due to

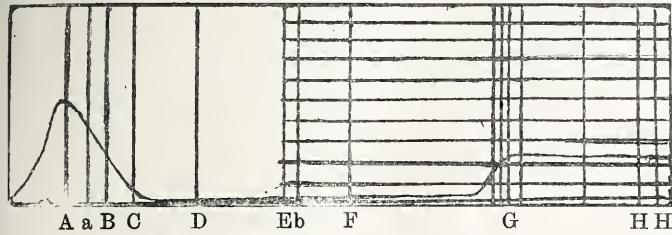


Fig. 25.—COBALTIc METANTIMONIATE.

the action of the red rays. As a confirmatory test, a third sheet was exposed and developed under similar conditions. This time a print was obtained exhibiting three bands, situated respectively in the red, the indigo, and the violet. The two latter were, however, excessively faint, a circumstance which served to account for their being overlooked in the former experiment. The band in the red, it should be added, though perfectly distinct, was somewhat weaker than before. In fig. 25 a representation is given of this metantimoniate image.

EXPERIMENTS WITH COBALTIc SULPHANTIMONIATE.

A slightly acid solution of cobaltic tartrate was agitated with one of potassium sulphantimoniate and allowed to stand for a few hours. The clear solution was then decanted off from the precipitated acid tartrate and employed as a sensitisier in the usual way. A sheet of the sensitised and dried paper was exposed to the action of the spectrum. In the course of from forty to fifty hours an extremely faint band was noticed lying in the blue rays. A further exposure of thirty hours effected no appreciable alteration in the appearance of this band. The print was then removed to the ferricyanide bath. After several minutes had elapsed it acquired a fairly uniform plum colour all over, the band in the blue being destroyed, or at all events lost to sight. There were no indications of bands in any other quarter.

A second strip was next exposed in the spectrum slide for seventy-five hours, and transferred to a bath containing a very weak aqueous solution of argentic nitrate. The chemical action displayed was of a more energetic character than had been anticipated, and, owing to the granularity of the black coating deposited on the exposed surface, it was found impossible to decide whether or not an image by development had been formed.

EXPERIMENTS WITH COBALTIc THIOSULPHATE.

A solution of sodium thiosulphate was made alkaline with ammonia, and added in slight excess to one of cobaltic oxalate, and paper was sensitised with the mixture. After drying in the dark, a sheet was exposed in sunshine beneath a negative for two hours, but no perceptible image was produced. A second sheet was exposed for three hours in the

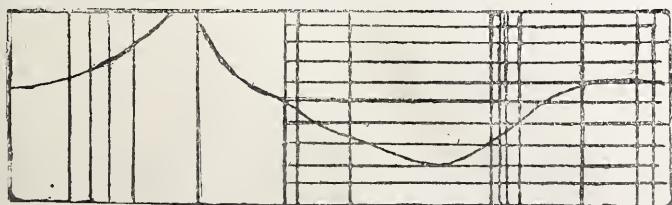


Fig. 26.—COBALTIc THIOSULPHATE.

spectrum slide. On development in the ferricyanide bath, there appeared, after long soaking, two very delicate bands of an olive colour, situated respectively under the orange and the yellow rays.

It was also noted that beneath the indigo and the more refrangible portion of the blue the paper was bleached a pure white, a circumstance

clearly attributable to the action of the developer. In the next experiment, a sheet of the sensitised paper was exposed to the rays of the spectrum for a period of forty hours. On examination, it was found that it had assumed a faint sea-green colour under the red and the orange rays. The sheet was divided lengthwise into three pieces, and one of these was then treated in the ferricyanide bath. Beyond an alteration in the colour of the bands, which now became pale pink, no change ensued, the paper at the more refrangible end remaining white as before.

The second strip was developed in an aqueous solution of mercurous nitrate. It instantly assumed an intense black colour, the depth of which was such as effectually to conceal the supposititious image. The remaining strip was transferred to a weak developer, made by adding to the mercurous nitrate bath a very dilute aqueous solution of nitrate of lead. The action was again almost instantaneous, but the black deposit, though still considerably stronger than was desired, was scarcely so vigorous as before. On removing the print from the bath, and subjecting it to pressure under a leaf of dry paper in order to remove the superfluous precipitate, indications of a negative image were presently perceptible.

Where the action of light had been strongest, viz., under the red and orange rays, the black deposit had almost entirely detached itself from the paper, leaving only a faint impression.

Where, on the contrary, the light had exercised least influence—as, for instance, under the blue, and to a less degree under the green rays—the colour was very intense, the precipitate having resisted removal with unexpected tenacity.

An attempt has been made to reproduce this instructive negative image in a positive form, the relative intensities throughout being carefully preserved. Fig. 26 represents the result.

The experiments above described suffice to show that cobaltic thiosulphate is very little sensitive to light, and also that its decomposition is probably due to the action of the red, the orange, and the yellow rays.

EXPERIMENTS WITH COBALTIc BORATE.

Cobaltic oxide is apparently quite insoluble in a cold solution of boric acid. On prolonged boiling, a very pale pink solution is obtained, but it seems doubtful whether this is a cobaltic or a cobaltous compound. For photographic purposes, therefore, it is better to prepare the borate by double decomposition. The paper employed in the following experiments was one which had been sensitised with cobaltic oxalate, and re-sensitised with a concentrated solution of borax. Two sheets thus prepared were exposed in sunshine beneath a negative, the one for two, the other for three, hours. In neither case were any signs of an image produced. They were then treated to a long soaking in the ferricyanide bath, but this did not effect the desired development. A third sheet was then exposed, this time to the action of the solar spectrum. When forty hours had elapsed, it was removed from the spectrum slide for examination.

Not the least indication of a picture was visible. The sheet was divided into three parts, each of which was developed in turn.

The first strip was treated in a bath containing a solution of mercurous nitrate. As no change manifested itself, the strip was removed, rinsed in water, and immersed in a very weak aqueous solution of potassium dichromate. It speedily assumed a yellow tint, but the character of the deposit was too uniform to suggest the idea of an image. The second strip was transferred to a mixed solution of the nitrates of lead and mercury. The result was equally unsatisfactory, nothing resembling an image being obtained. The last portion of the print was developed in the ferricyanide bath. In the course of a few minutes an exceedingly curious and interesting phenomenon, probably of the nature of interference, made itself apparent. A print of excessive delicacy was produced in colours bearing a tolerably close resemblance to those of the spectrum. Under the red, the orange, and the violet rays, a pink was produced; under the yellow rays, a yellow; under the green, a bluish-green; and beneath the blue and the indigo a blue, so faint as to be almost imperceptible. These colours were still more evident when the strip was removed from the bath and the surface gently wiped free from superfluous moisture.

The heliochromatic effect was, unfortunately, very evanescent. On replacing the print in the bath, with the object of intensifying the colours, the bands soon disappeared from sight, and the strip assumed a dirty white colour.

The pink due to the action of the red rays alone survived, and that only in an attenuated form. This, the only permanent band, seemed, therefore, to represent the true latent image, a circumstance that would seem to warrant our assigning a low place to the borate in the scale of sensitiveness.

EXPERIMENTS WITH COBALTIc CHROMATE.

Some experiments made with a chromate in the presence of a cobaltic salt were described in the second of these articles. It may be remembered that, in the cases therein alluded to, the colour of the image obtained was blue, a fact which seemed to point to the absence of chromium trioxide in the newly-formed compound. The experiments with the citrate now to be described yielded results differing so much from the foregoing in character as to raise a doubt whether they could be attributed to the

same source. It was thought well, therefore, to defer mention of them till the present stage was reached.

The classification now adopted, it should, however, be stated, is purely one of convenience. Strictly speaking, the term, cobaltic chromate, should be applied rather to the salt formed by dissolving cobaltic hydrate in chromic acid rather than to the somewhat dubious compound which may be supposed to result from double decomposition.

Paper was coated with a strong aqueous solution of potassium dichromate, dried in darkness, and treated with two washes of a solution of cobaltic citrate. When dry, three sheets were exposed in succession to light under the same negative, the exposures given being respectively ten, twenty, and thirty hours.

In the first case, the result was a greenish-grey image, somewhat lacking in vigour, but remarkably distinct and full of detail. Treated in a bath containing an alcoholic solution of gallic acid to which one-third of its volume of a strong aqueous solution of acetate of soda had been added, the picture was speedily blurred beyond recognition, nor were there subsequently any signs indicative of the formation of a new image by development.

When the second of the exposed sheets was removed from the printing frame, the faint outlines of an image were just barely perceptible. The bleaching process had evidently made considerable progress, for even in those portions of the paper least exposed to light the original yellow colour due to the dichromate was almost wholly discharged. The sheet was transferred for intensification to a bath containing an aqueous solu-

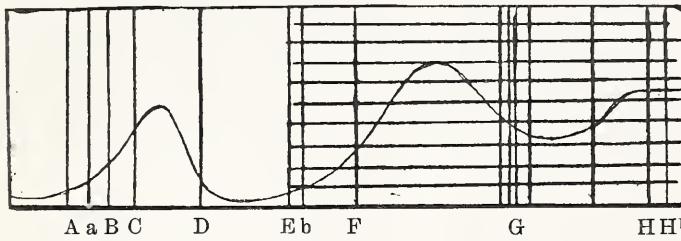


Fig. 27.—COBALTI CHROMATE.

tion of potassium nitrite rendered slightly alkaline by the addition of a little ammonia. An alteration in the appearance of the print was speedily effected. The outlines of the image, formerly so feeble, became very distinct, the increase in density being due to the deposition, in considerable quantity, of potassium-cobaltic nitrite ($K_6Co_2(NO_2)_12$), more commonly known by the name of aurolein or cobalt yellow.

A peculiar significance attaches to the experiment just described. The intensifying process, as has been said, resulted in the formation of a cobaltic salt. Now, at first sight it would seem difficult to account for the presence in the exposed sheet of a cobaltic compound capable of reacting with the nitrite of the bath, for, as we know, cobaltic compounds are reduced to the cobaltous state by the action of light. On the other hand, the fact that the yellow double nitrite was so formed furnishes the strongest possible evidence for our affirming the existence of such a compound.

The only way, apparently, in which we can seek to reconcile these conflicting data is by inquiring whether some vital circumstance has not been overlooked. Let us, then, step by step, review the facts with which experiment has provided us. In the first place there is the main fact that an image is formed. To state it in a different way, by the solar action the salts of the higher oxide of cobalt present in the sensitive medium have been reduced to the state of the lower. In the second place we note, as the result of further exposure, a phenomenon of quite a contrary character. Contrary to what might be expected, the intensity of the image diminishes in proportion as the exposure is increased. Bleaching ensues, and the work originally performed is gradually undone. What chemical explanation, we ask, can be given for this remarkable change? The answer—and it is satisfactory to find that experiment supports what analogy suggests—is that the deoxidized cobalt compounds when exposed to light again take up oxygen and reassume the cobaltic state. According to Chastang, a similar behaviour characterises the salts of ferrous oxide when exposed to rays of a low degree of refrangibility. The reaction in the case of the cobaltic salts is probably of a somewhat complicated character as regards the rays operative in producing the change. It was shown in an earlier article that the picture formed when the citrate and dichromate are exposed together to light bleaches most readily under the blue rays. See the diagrams in the number of this JOURNAL for August 19, 1898. At the time of writing the said article, however, as may be seen from the concluding paragraph, no evidence had yet been obtained to show that the bleaching action was due to oxidation.

The third sheet (*i.e.*, that exposed for thirty hours) exhibited no image when removed from the printing frame. On transferring it to the gallic acid bath, and adding from time to time a little ammonia to facilitate the operations, an orange-brown picture was gradually developed which, on drying, became excessively feeble, only the bare outlines of the image remaining.

The remaining experiments were made with the pure chromate.

Cobaltic hydrate having been dissolved by the aid of a gentle heat in chromic acid, paper was sensitised with the yellow solution and dried. Two strips of this were then exposed to the light of the spectrum, the one for thirty-five, the other for sixty hours. No change was apparent in either case. On developing the former in the usual ferricyanide bath, it assumed a faint reddish colour, which was, unfortunately, too slight to afford a clue to the nature of the change effected by exposure. The second strip, on being treated in the same way, yielded, after a considerable expenditure of time and pains, a very faint purple image, the details of which are represented with an approximate fidelity in fig. 27.

The point of maximum action lies in the blue. The influence of the violet rays is somewhat marked, that of the indigo a little less so, while, at the opposite end, the orange rays play a prominent part, and rank equal with the violet as regards intensity.

THE NEW GOERZ DOUBLE ANASTIGMAT LENS.

HERR KLEPP gives the following comparative notes of his examination of one of the new Series IIa double anastigmats, composed of ten lenses, and one of the old double anastigmats (Series III., $f=7.7$). The

apertures are calculated on Stolze's system, which takes as its unit $\frac{1}{\sqrt{10}}$, and the full aperture of the lens was $f=5.428$, the catalogue aperture being $f=5.5$. The spherical aberration was as follows for the various angles:—

	0°	5°	10°	15°	20°	25°	30°	35°	
New Double Anastigmat (Series IIa). Full aperture, $f=5.5$.	—	± 0.0	-0.2	-0.3	-0.5	-0.4	± 0.0		Meridional +1.0, sagittal +1.8.
Old Double Anastigmat (Series III). Full aperture, $f=7.7$.	—	-0.2	-0.5	-0.8	-0.5	-0.1	+0.1	—	

All measurements in millimetres.

THE CADETT LIGHT FILTERS.

MESSRS. CADETT AND NEALL, of Ashtead, are issuing the following revised particulars of their light filters:—

1. The "Absolutus." The "Absolutus" light filters are adjusted for the lightning spectrum plates, and will render all colour luminosities correctly, with a small margin of error. Each light filter is carefully tested with the latest form of Captain Abney's colour sensitometer. These filters are of no use for any other orthochromatic plate than the lightning spectrum plates. The best and most easily arranged position for the filter is immediately behind the lens in the camera, care being taken to exclude all reflected light between the filter and the lens. The filter can, however, be placed in any suitable position. Exposures, when using the "Absolute" filter, are increased twenty times under glass or in well-lighted studios, and about forty times out of doors.

2. The "Givus." The "Givus" filters are also adjusted for the lightning spectrum plates, and will render the violet, blue, and green luminosities correctly, leaving the red luminosities uncorrected. The "Givus" filter is a compromise for use where rapid exposures are necessary, and they give great improvement in landscape and portrait work. The exposure is only increased from three to four times. Care should be taken to avoid leaving these filters in direct sunshine or long-continued daylight; when not in use, they should be kept in the case. The surfaces being optically worked, the filters should be treated as a lens, and every care taken to avoid scratches.

EXHIBITION OF THE BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.

THE Borough Polytechnic Photographic Society held its Fifth Annual Exhibition of photographs at the Borough Polytechnic Institute, Borough-road, S.E., on December 27, 28, 29, and 30.

There are probably few photographic societies that can lay claim to a career of greater usefulness than that which forms a section of the Borough Polytechnic Institute. We must confess to some feeling of surprise on perusing the syllabus of the present session. That the Society was an active one we have always understood, but we were not prepared to find anything like the organization that exists. The Society holds two meetings in each week. One is conducted on the ordinary

lines of a photographic society's meeting, and needs no comment except that the programme gives an admirable list of lectures and demonstrations. The second meeting in the week is purely educational, and includes, during the session, twenty-three lectures of a more or less elementary nature upon the practical points of photography. In addition to that of attending all these meetings, the members have the privilege of using the dark room and the apparatus and accessories belonging to the Society, and all for quite a nominal subscription. The elementary lectures on the practice of photography constitute a feature particularly worthy of commendation. There is a perennial complaint of the rule-of-thumb methods and the absence of knowledge of the simplest scientific facts connected with the business on the part of photographic operators and assistants, and, as the opportunities afforded for obtaining more exact knowledge are quite insufficient, every systematic attempt to supply the deficiency deserves all encouragement.

The Exhibition, though not a very large one, was of a fairly high level of excellence. There were about the same number of frames in the members' classes as in the open classes, and, on the whole, the members made the better show. The classes on the members' side were the usual subject ones, and, in addition, a class for instantaneous and hand-camera work. The last-mentioned class, the smallest in the Exhibition, had its awards withheld. The exhibitors evidently took the sensible course of exhibiting their hand-camera work in the subject classes. The Judges appointed were Messrs. J. A. Hodges, F.R.P.S., E. J. Wall, F.R.P.S., and the Rev. F. C. Lambert. The two last-named did not materialise, leaving Mr. Hodges to act alone; and, judging by the awards, he seems to have performed his duties somewhat hurriedly.

The Landscape and Seascapes Class was noticeable for the prevalence of what, we suppose, must be looked upon as the fashionable subject of the day—woodland scenery with or without sheep, much of it very good work, that would have been thought a great deal of a few years ago, when swamps and mud-flats were all the rage, but somewhat tiresome now in its monotony. The Architecture was not so satisfactory. Many of the pictures, enlargements on bromide paper, suffered either from a general flatness and want of differentiation of planes, or an offensive wiry sharpness, which, though it frequently occurs, may easily be avoided. The three prizes were awarded to Mr. A. Bedding, whose work was all excellent, but the Judge must either have omitted to see Mr. R. R. Rawkins' *Canal Lock*, or must have misunderstood it.

The animals had evidently strayed from the class for Flower and Animal Studies, and were to be found grazing elsewhere but there was a wonderfully good show of flowers and fruit. E. W. Burch fully deserved his two medals for groups of fruit, and many of the flower studies by himself and others were capital; one felt, however, a tendency to look at most of the flower studies as nicely arranged botanical specimens rather than as pictures.

In the Portraiture Class W. H. Andrew received a medal for a very commonplace piece of work entitled *A Puzzler*. It is a puzzler to us why his infinitely better attempt, *Weary, Worn, and Sad*, in the Novices' Class, was passed over. We can only suppose the Judge did not see it. The members' lantern slides were very good indeed, and as a whole better than those in the open classes.

The Champion Class in the open classes was as usual a weak one, but it should be noted that F. W. Bannister, a member of the Society, gained the award. The General Class contained a good deal of interesting work, the most noteworthy exhibitors being G. B. Cowen, Mrs. A. M. Dumas, E. B. Eldridge, A. R. Read, jun., H. C. Leat, Graystone Bird, J. L. Shawcross, J. Kearney, jun., J. C. Ashton, W. J. Byrne, S. R. Brewerton, T. P. Cooley, J. K. Ayling, W. Illingworth, F. W. Bannister, and R. R. Rawkins. In addition to the ordinary attractions of the Exhibition there were lantern displays each evening and various other entertainments.

LIST OF AWARDS.

Members' Classes.

Class A (Landscape and Seascapes).—Silver medal, F. W. Bannister; bronze, H. Heath and R. R. Rawkins.

Class B (Architecture).—Silver medal, A. Bedding; bronze medals (two), A. Bedding.

Class C (Flower and Animal Studies).—Silver medal, E. W. Burch; bronze, E. W. Burch.

Class D (Instantaneous and Hand-camera Work).—Awards withheld.

Class E (Figure Studies and Portraits).—Bronze medals, W. H. Andrews and E. W. Burch.

Novices' Class.

Class F.—Bronze medal, W. W. Brewer.

Class G (Lantern Slides).—Silver medal, H. J. Blane; bronze, E. J. Hoare and A. Bedding.

Mr. Harris's silver medal for Best Print in members' classes, F. W. Bannister.

Open Classes.

Class H (Prints previously Medalled).—Gold medal, J. Kearney, jun.; silver, F. W. Bannister.

Class I (Prints not Medalled previous to December 9, 1899).—Silver medal, Mrs. A. M. Dumas; bronze, Eveyn Boden, F.R.P.S., and R. Jones.

Class K (Lantern Slides previously Medalled).—Gold medallion, A. E. Smith; silver medal, J. Kearney, jun.
Class L (Lantern Slides not Medalled previously to December 9, 1899).—Bronze medal, F. Judge, John Beeby, and R. R. Rawkins.

THE R.P.S. COUNCIL ELECTION.

ATTENDANCES OF OFFICERS AND MEMBERS OF COUNCIL DURING 1899.

Number of Council Meetings.	Number of Committee Meetings.	Name.	Number of Attendances at Council Meetings.	Number of Attendances at Committee Meetings.
14	26	The Earl of Crawford ...	7	2
14	2	Captain W. de W. Abney ...	4	0
14	0	T. R. Dallmeyer...	6	0
14	11	Chapman Jones ...	13	10
14	2	Sir H. Trueman Wood ...	6	1
14	26	G. Scamell ...	14	23
14	28	Major-General J. Waterhouse...	13	26
14	3	H. Wilmer ...	4	0
14	0	F. Ince ...	2	0
12	14	R. Child Bayley...	12	7
14	6	Thomas Bedding ...	13	4
14	3	T. Bolas ...	14	3
14	0	C. H. Bothamley ...	3	0
14	7	F. A. Bridge ...	11	4
14	0	A. Cowan ...	9	0
14	6	W. E. Debenham ...	12	3
14	0	A. Haddon ...	9	0
13	4	J. A. Hodges ...	12	3
14	10	Rev. F. C. Lambert ...	12	6
14	22	A. Mackie ...	12	19
14	11	J. W. Merchant ...	10	9
12	8	J. A. Sinclair ...	10	6
14	0	J. Spiller ...	9	0
14	0	J. W. Swan ...	0	0
11	9	J. J. Vezey ...	10	8
12	0	E. J. Wall ...	11	0
14	14	H. Snowden Ward ...	9	8
14	0	Leon Warnerke ...	1	0
14	8	J. B. B. Wellington ...	11	7

THE "TWENTIETH CENTURY" PHOTOGRAPHIC EXHIBITION.

NOVEL COMPETITIONS, AND COMPETITIONS FOR PROFESSIONALS AND EMPLOYEES.

The prospectus of the above, which forms a section of the Twentieth Century Engineering and General Trades Exhibition, Bingley Hall, Birmingham, March 1900, is now before us, and we note with some pleasure a slight return to the days of old, with special classes for professional workers. Mr. Walter D. Welford, 19 Southampton-buildings, Chancery-lane, W.C., is manager again, and these competitions give evidence of some desire to cater for the professional photographer, and for the hard-working army of *employés*, for whom that gentleman still has a warm corner in his heart, evidently. Referring first to these special classes, the following are the details:—

Class J (Combination Printing).—A series of half-plate negatives of the same figure subject are obtainable from the Manager, price 2s. 6d. each, post free. The competitor must, by combination printing, produce a picture containing this figure, with his own background. Print may be by any process and any size. The usual entry fee per framed print must be paid, and the competitor may send more than one result. Silver medal, bronze medal, diploma.

Class K (Negative Working Up).—A series of half-plate negatives of one subject, absolutely alike, containing certain marked defects, are obtainable from the Manager, price 2s. 6d. each, post free. The competitor must so work up, retouch, or spot the negative to obtain the best print (any process) which in turn may be worked up. The frame must contain two prints, one from the negative in its original state, and the other the finished result. The entry fee for this class will be 1s. for the frame, but, if the prints are framed separately, the fee will be 2s. Confined to *employés* of professional photographers. Silver-gilt medal and diploma, bronze medal and diploma.

Class L (Trade Work).—Photographs of Machinery, Samples, Tools &c., made for trade, advertising, or catalogue purposes. For professional photographers only. Silver gilt medal and diploma, bronze medal and diploma.

Although, perhaps, the award (in Class K, say) would not be of value

to that issued by some Examination Board, yet it must be remembered that at present the *employé* has no opportunity of obtaining anything of the kind, so a diploma gained against other workers for skill in retouching and working up of a negative ought to be a little assistance to him with employers. We hope to see Mr. Welford's enterprise well supported by professional photographers.

Turning now to the competitions generally, there are twelve classes altogether, for which are offered (counting the Champion medals) one gold, eleven silver gilt, four silver, and twelve bronze medals, and fourteen diplomas, with the following extra and special prizes, two silver medals, hand camera value 2*l*. 10*s.*, "Tella" cash prize 2*l*. 2*s.*, and a prize value 1*l*. 1*s.* The majority of the classes are open alike to amateur and professional, and there is no restriction as to previously medalled work (except in one class), but pictures exhibited at Birmingham in 1899 are debarred. Mr. Welford will be pleased to send prospectuses upon receipt of stamp.

THE BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Fifteenth Annual Exhibition of the Birmingham Photographic Society will be held at the Royal Society of Artists, New-street, from February 24 to March 3, 1900.

The Exhibition will be inaugurated on Saturday evening, February 24, by a private view and *conversazione*, and will remain open from 10 a.m. to 10 p.m. from Monday, February 26, to Saturday, March 3. The rooms are excellently lighted from the top (artificially by electricity), and admirably arranged for the display of artistic work to the best advantage. The Judges will be Messrs. William Crooke, W. J. Wainwright, A.R.W.S., and J. B. B. Wellington.

In addition to the competitive sections there will be a loan collection of photographs contributed by a selection of the leading pictorial and artistic workers of the country, also a series of exhibits by eminent professional photographers in Birmingham. There will also be an exhibition of apparatus. Cinematograph and lantern entertainments, vocal and instrumental music will be given each evening.

The Hon. Secretary of the Exhibition Committee is Mr. L. Lloyd, The Hollies, Church-road, Moseley, Birmingham.

THE LATE W. J. BELTON.

WE are sorry to learn of the death of Mr. W. J. Belton, the well-known photographer, which took place at his residence, Aberdeen, on the 20th ult. Mr. Belton, who was about fifty-three years of age, had been ill for some weeks with rheumatism, died very suddenly, and leaves a widow and a large family.

The deceased gentleman will be recollect in recent years as the very able demonstrator of the Velox specialities for Messrs. Griffin. Prior to this, he was for some time connected with the well-known house of G. W. Wilson & Co., of Aberdeen; but his photographic experiences went back nearly forty years. His father before him was a well-known trade printer and general photographer, and the son followed the same profession for something like a quarter of a century. He was a man of great photographic ability and experience, and of a most genial disposition.

We are sure that very many of our readers will learn of Mr. Belton's early death with sincere sorrow, and will sympathise with the widow and family in their loss. For ourselves, we lament the loss of a personal friend of nearly twenty years' standing.

Messrs. J. J. Griffin & Sons send us the following sympathetic references to our late friend:—Mr. W. John Belton has followed photography from his youth, being associated with his father (26 St. Paul's-crescent, N.W.), for twenty years, carrying on a prosperous business in printing and enlarging. An opening presenting itself at Messrs. Wilson & Co.'s, of Aberdeen, he accepted a position as manager, acting for them in that capacity for a considerable time. He will best be remembered, however, in connexion with his many able demonstrations of Velox paper during its first introduction to the British public in the years 1898-99. The members of photographic societies all over the country will miss his cheery and interesting lectures and painstaking demonstrations. The solicitude he showed for explaining every difficulty, and answering as fully as possible the frequently harassing questions put to him, made him much sought after at these gatherings, and in consequence his loss will be keenly felt.

THE PHOTOGRAPHIC SOCIETY OF IRELAND'S FORTH-COMING EXHIBITION.

THE following are the classes and rules for competition at the Annual Exhibition, to be held in the large hall of the Photographic Society of Ireland, 35, Dawson-street, Dublin, from March 26 to 31, 1900. For members only—Silver and bronze medals in each class, each entry to

consist of one picture: 1. Landscape and Marine; 2. Landscape and Marine, taken with camera held in the hand; 3. Pictures with objects in motion; 4. Figure and Animal Studies, and Portraits, if not taken in professional studio; 5. Historical, Architectural, and Archaeological; 6. Still Life, including Fruit and Flowers; 7. Lantern slides, (a) landscape or marine, (b) other subjects, sets of four; 8. Enlargements. For members who have never won a medal in any society—Bronze medals: 9. Prints, any subject; 10. Lantern Slides, sets of four, an subject. There is no entrance fee for the foregoing. The "Werner" special medal will be awarded to the member of the P.S.I. whose picture will be judged the best in artistic merit. The "Strangeways" special medal will be awarded for best set of four stereoscopic pictures shown by a member of the P.S.I. The Open Class, for all comers, in which gold, silver, and bronze medals will be awarded, is as follows: 11. For best picture, any subject or size, produced by any process. The gold medal will not be awarded unless there are at least 100 entries. The entry fee is one shilling for each picture sent in. All exhibits must be delivered at the Society's premises before March 10, and be removed within a week after close of Exhibition. Exhibits from a distance will be packed and returned to carriers; carriage must be paid both ways by exhibitors and, while every care will be exercised, no responsibility will be accepted by the Society. The Council invite pictures for exhibition only. All further particulars can be obtained of the Hon. Secretary, Mr. W. F. Cooper, 35, Dawson-street, Dublin.

Our Editorial Table.

THE GLOUCESTER DIARY FOR 1900.

By the courtesy of the Gloucester Wagon Company we have received a copy of their conveniently arranged Diary for 1900. The special feature of the book include a "Directors' Calendar" on pages 70 and 71, and a note on each day throughout the Diary to enable the periodic recurrence of fixed engagements to be recorded, such as Board or Council Meetings fixed to be held, for example, on the second Tuesday in each month. Among the notes for visitors to Gloucester on pages 65 to 69 particular are given respecting many features of interest, including the Severn "Bore," the Gloucester "Mop," and the "Festival of the Three Choirs," which is perhaps the oldest and most important annual musical meeting held in Great Britain (the Welsh Eisteddfod alone excepted.) This Festival occurs in Hereford in September 1900.

LIESEGANG'S PHOTOGRAPHISCHER ALMANACH, 1900.

Ed. Liesegang, Düsseldorf.

THIS annual appears for the twentieth time, and the present volume deserves the hearty support of German photographers. It contains a series of very interesting articles by leading German writers, among whom we notice Professor Valenta, Dr. R. Abegg, Dr. von Rohr, C. A. Angerer, J. Gaedicke, S. Jaffe, and E. Obernetter. There is also a collection of recently published formulæ.

PHOTOGRAPHISCHE PHYSIC.

By R. ED. LIESEGANG. Ed. Liesegang, Düsseldorf.

WE are glad to see that Dr. R. E. Liesegang has published, in this small volume, some account of the studies he has made, during the last few years, of the physics of photography. He justly remarks in the preface that, in addition to the purely chemical, there is a series of physical processes involved in photography, and that they have hitherto received very little attention. We recently published a translation of a chapter from this book (see THE BRITISH JOURNAL OF PHOTOGRAPHY, August 25, 1899), which Dr. Liesegang kindly sent us in advance, and those of our readers who are interested in the science of photography will find the volume of great interest.

THE CADETT BROMIDE PAPERS.

Manufactured by Cadett & Neall, Ashtead.

To their list of well-known and justly appreciated photographic preparations Messrs. Cadett & Neall have just added a happily named "Platinum-black" bromide paper, issued with both rough and smooth surfaces. The manufacturers state that they have received some valuable reports on the quality of the papers, which are prepared to give brilliant prints from delicate negatives such as are made in portrait studios. In the instructions for development the following useful hint are given:

As a rule users of bromide papers prefer to soak the paper in water before development, in order that the paper may lie flat on the dish; we do not, however, recommend this to be done if it can be possibly avoided, development being much more even by pouring the developer rapidly over the surface of the dry paper; there is also much less danger of

eveloping bubbles. Our advice is to use plenty of developer, drain the dish carefully and the paper will generally be found flat enough to use dry, and will lie flat if the corners be pressed down on the slightly wet dish. No time should, however, be lost in pouring on the developer. Should any moisture from the dish can soak through the paper. Should it be thought desirable, it should be done for at least two minutes.

FORMULÆ.

No. 1.

Metol	100 grains.
Hydroquinone	50 "
Sodium sulphite (cryst. and fresh)	2 ounces avd.
Water to make altogether	40 ounces fl.

No. 2

Sodium carb. (cryst. washing soda, select translucent pieces)	1 ounce avd.
Potassium bromide	60 grains.
Water to make altogether	40 ounces fl.

Equal parts of Nos. 1 and 2 to make developer. No clearing solution required.

Fixing.

Water	20 ounces fl.
Hyposulphite of soda	½ lb.

This developer works slowly, but gives very brilliant prints. The bromide of potassium may be halved if thought desirable. In cases where dense negatives are used or soft prints required, the following developer will be found more suitable:—

METOL DEVELOPER (one solution only).

Distilled or soft water	80 ounces fl.
Metol	1 ounce avd.
Sodium sulphite (pure recryst.)	5 ounces.
Sodium carbonate (cryst. washing soda, select translucent pieces)	6½ ounces.
Or, instead, anhydrous sodium carbonate ...	2½ ounces.

These must be completely dissolved in the order named, the water not being colder than 60° F.

Take 1 part of the above one-solution developer and dilute it with 3 parts of water. This developer works with great rapidity. Variations may be made in the brilliancy of the prints by altering exposure, time of development, and by diluting the developer with water. Should the prints be too brilliant, increase exposure and dilute the developer. Remember that prints appear more brilliant when wet than when dry.

Fixing Solution.

Hypo	½ pound.
Water	1 quart.

The developer keeps fairly well in stoppered bottles.

FERROUS-OXALATE DEVELOPER.

A.

Protosulphate of iron	2½ ounces avd.
Sulphuric acid	15 minims.
Or citric acid	20 grains.
Distilled water to make altogether	10 ounces fl.

B.

Neutral potassium oxalate	10 ounces avd.
Potassium bromide	10 to 20 grains.
Distilled water to make altogether	40 ounces fl.

For use take 1 part of A to 4 parts of B.

A clearing bath should be used with this developer to get rid of the oxalate of lime formed in ordinary washing water:—

Water	80 ounces.
Glacial acetic acid or hydrochloric acid.....	½ ounce fl.

We prefer to use this bath after fixing and well washing. If used before fixing, wash the prints well before fixing, or the hypo will be decomposed in the film and the prints may fade. The clearing bath should act for ten minutes, then wash well.

Fixing Bath.

Hypo	½ pound.
Water	1 quart.

ORTOL DEVELOPER.

A.

Potassium metabisulphite	200 grains.
Ortol	400 "
Distilled water	40 ounces fl.

B.	
Potassium carbonate (anhydrous)	900 grains.
Sodium sulphite	6 ounces avd.
Distilled water	40 fl.
Potassium bromide	10 to 20 grains.

Take equal parts of A and B, and then dilute with an equal part or more of distilled or boiled water. The bromide of potassium may be omitted if desired.

Fixing Bath.

Hypo	½ pound.
Water	1 quart.

The popularity of the bromide process increases with its age. Fourteen or fifteen years ago, when the paper then available gave dull, heavy blacks and little or no gradation, it was thought that the process was not destined to survive; but, as improvement after improvement was introduced, and it became possible to produce a bromide print giving transparency in the shadows and rendering the most delicate gradations, the popularity of this method of printing advanced in an equal degree. There is no doubt that Messrs. Cadett & Neall have chosen wisely in entering this branch of manufacture, and that their very high reputation for excellence of sensitive preparations will stand them in good stead in catering for a demand which is practically unlimited.

CAMERA NOTES FOR JANUARY 1900.

Published by the Camera Club of New York, 3-7 W. 29th-street, New York.

In another part of this week's JOURNAL we print several American criticisms of English photographs that have recently been exhibited in the United States, and we wish we had the space to make a long extract from the thirty-page notice of the late Exhibition of the Philadelphia Photographic Salon, contributed to the number of *Camera Notes* now lying before us, by Mr. J. T. Keiley. It is one of the ablest and best-balanced pieces of critical writing about a photographic exhibition that we have read for a long time—appreciative, discriminative, and founded upon an intimate study of the pictorial possibilities of photography.

We must congratulate the editor (Mr. Steiglitz, we believe) upon this number of *Camera Notes*. It occupies over eighty well-printed pages, and there are many photogravure and half-tones reproductions of notable photographs. Its one fault is a superabundance of unilluminating twaddle on pictorial photography (we are here excepting Mr. Keiley's tersely cast criticisms), which simply resolves itself into a defence of photo-faking—the sort of thing with which photographers here have been deluged *ad nauseam* for the last ten years, and which we do not anticipate our sensible American brethren will long tolerate. Decidedly *Camera Notes* is a charming publication, and we regard it as the best thing of its kind issued in connexion with photography.

'P.P.P.' (PLEASANT PRINTING PAPER).

Manufactured by J. D. Mucklow, 2, Turle-road, Tooting-park, N.

THE pleasant printing paper of Mr. Mucklow, who has long been very favourably known for the excellence of his printing surfaces, is an albumen paper which we find to give results fully comparable to the best produced by this old-fashioned system of printing, which, in these days of a multiplicity of processes, has much to recommend it. Any ordinary toning bath used for albumen prints will suit "P.P.P.", and the Paget combined bath for P.O.P. also answers well with it. We can thoroughly recommend Mr. Mucklow's "P.P.P." to lovers of albumen printing.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(Received too late for the ALMANAC.)

ATTERCLIFFE (SHEFFIELD) PHOTOGRAPHIC SOCIETY.—Meetings held at the Friends' Adult School, Leeds-road, on the second Monday in the month. President: Mr. J. Ashurst.—Vice-Presidents: Messrs. A. W. Cotterell, V. J. Roberts, and L. Havenhand.—Council: Messrs. Ellis, Mills, Armitage, Moxon, Driver, Walton, Blythe, Gosling, and Rogers.—Treasurer: Mr. S. Hughes.—Hon. Secretary: Mr. A. Birtles, 51, Cresswell-road, Darnall, Sheffield.

HAWKE'S BAY CAMERA CLUB.—Established April 19, 1895. Meetings held at the Club Room. President: Dr. J. H. E. Jarvis.—Vice-President: Mr. A. A. Kennedy.—Committee: Dr. A. Milne Thomson, Messrs. H. A. Banner, R. J. Duncan, S. E. Cooper, J. K. Newton, and C. Saunders.—Secretary and Treasurer: Mr. W. Beswick, Post Office.

KINGSTON-ON-THAMES AND DISTRICT PHOTOGRAPHIC SOCIETY.—Established 1893. Meetings held at the Sun Hotel, Kingston-on-Thames. President: Rev. G. I. Swinnerton, M.A.—Vice-Presidents: Dr. Finny, Rev. F. C. Lambert, M.A., Dr. Luscombe, Dr. Munyard, Messrs. W. E. Price, A.M.I.C.E., W. Montagu Robertson, and George Sanders, J.P.—Committee: Messrs. T. W. Wilson.—Treasurer: Mr. W. Montagu Robertson.—Secretaries: Messrs. John F. East, Uxbridge House, Kingston-on-Thames, and A. Evelyn Smith, 6, Beaufort-villas, Beaufort-road, Kingston-on-Thames.

NELSON CAMERA CLUB.—Established 1888. Meetings are held at the Club Rooms, Hardy-street, Nelson, N.Z. President: Mr. C. Y. Fell.—Committee: Messrs. H. Brusewitz, H. V. Gully, and F. W. Hamilton.—Treasurer: Mr. F. Washbourne.—Secretary: Mr. A. H. Patterson, Nelson, N.Z.

NORTHERN TASMANIAN CAMERA CLUB.—Established 1889. Meetings held at the Albert Hall, Launceston, Tasmania. President: Mr. F. C. Birchall.—Vice-Presidents: Messrs. William Gibson, W. H. Twelvetrees, and J. Sparrow.—Committee: Messrs. H. B. Brownrigg, C. Hart, and A. H. Masters.—Secretary and Treasurer: Mr. F. Styant Browne, 112, Brisbane-street, Launceston, Tasmania.

NOTTINGHAM CAMERA CLUB.—Meetings held at the Mechanics' Institution. President: His Grace the Duke of Newcastle.—Vice-Presidents: Messrs. A. Pyatt, W. J. Abel, B.A., C. B. Wright, and F. N. Ellis, J.P.—Committee: Messrs. A. W. Flowerdew (Acting Chairman), Thomas Wright, A. R. Hartley, R. Chapman, T. K. Gordon, J. Anderson, W. R. Anderson, and Rev. W. H. Kynaston, M.A.—Secretary and Treasurer: Mr. Willis Ward, 14, Stratford-terrace, Nottingham.

NYMEEGSCHE AMATEUR FOTOGRAFEN VEREENIGING "M. C." NIJMEGEN, HOLLAND.—Established December 23, 1893. Meetings are held at the Café Suisse. President: Jacq. Kneppers.—Treasurer: Van de Graaff.—Secretary: Baron van Hemert.

PHOTOGRAPHIC SOCIETY OF NEW SOUTH WALES.—Established 1894. Meetings held at the School of Arts, Pitt-street. Patron: His Excellency Earl Beauchamp.—President: His Honour Judge Docker.—Vice-Presidents: Sir J. P. Abbott, K.C.M.G., Hon. F. T. Humphery, Messrs. C. G. Alford, R. W. Kirk, and E. T. Davis.—Committee: Messrs. H. T. Blake, F. H. Copeland, J. Heron, M. V. Murphy, and L. Roever.—Treasurer: Mr. J. M. Jago.—Secretary: Mr. James S. Stening, Box 829, G.P.O., Sydney, New South Wales.

SHASHIN-KIOKAI (THE PHOTOGRAPHIC SOCIETY OF JAPAN).—Established 1888. Meetings held at 1, Itchome Uchiyamashitacho, Tokyo. President: Prince M. Nijo.—Vice-President: Vice-Count M. Nagaoka.—Committee: Count U. Toda, Vice-Count Gnomoto, Baron Y. Hanabusa, Captain S. Toya, Dr. T. Kato, M. Nakajima, Count S. Omura, Vice-Count N. Okabe, Prof. Dr. D. Kikuchi, K. Ogawa, I. Tanaka, Dr. B. Marumo, R. Konishi, H. Shigyo, and S. Kiga.—Treasurers: S. Ohashi and K. Ikeda.—Secretaries: Prof. I. Ishikawa, Nandomachi, Tokyo, and K. Ogura, Minamiyenokimachi, Tokyo.

SOUTHAMPTON CAMERA CLUB.—Established 1896. Meetings held at the Kell Memorial Hall, Bellevue. President: Rev. E. C. Bennett.—Council: Messrs. W. Jarvis, E. J. Evans, F. Winzar, J. Stone, and F. Walter.—Lanternist: Mr. E. J. Evans.—Treasurer: Mr. W. H. Trigg.—Secretary: Mr. S. G. Kimber, Oakdene, Highfield, Southampton.

SOUTH AUSTRALIAN PHOTOGRAPHIC SOCIETY.—Established 1885. Meetings held at the Chamber of Manufactures, Adelaide. President: Mr. Andrew Scott, B.A.—Vice-Presidents: Messrs. R. F. Griffiths and F. A. Joyner.—Committee: The Executive Officers, and Messrs. C. L. Whitham, A. H. Kingsborough, and A. W. Marshall.—Treasurer: Mr. S. P. Bond.—Secretary: Mr. J. Gazard, 111, King William-street, Adelaide.—Assistant Secretary and Librarian: Mr. R. B. Adamson.

ST. MICHAEL'S PHOTOGRAPHIC SOCIETY.—Established 1896. Meetings held at the Church Institute. President: Rev. H. Gresford Jones, M.A.—Secretary: Mr. R. J. Lutas, Church Institute, St. Michael's-in-the-Hamlet, Liverpool.

WANGANUI CAMERA CLUB.—Established June, 1894. Meetings held at the Wanganui Museum Buildings. President: Mr. A. Elliott.—Vice-Presidents: Messrs. Babbage and S. Griffiths.—Committee: Messrs. Anderson, Drew, Allison, and Kersley, President, Vice-Presidents, and Secretary.—Hon. Secretary and Treasurer: D. Meldrum, Wanganui.

WORKING MEN'S COLLEGE PHOTOGRAPHIC CLUB.—Established 1891. Meetings held at Latrobe-street, Melbourne, Victoria. Patron: His Excellency Lord Brassey.—President: Prof. Kernot, M.A., M.E.—Vice-Presidents: Messrs. F. A. Campbell, C.E., T. C. Camm, and A. J. Campbell.—Committee: Messrs. H. P. Bennett, T. J. Eastham, J. Cathie, H. Vanheems, T. Gray, J. Glover, H. Hampson, A. B. Sturtevant, and L. Hart, F.R.M.S.—Treasurer: Mr. E. C. Moore.—Secretary: Mr. Arthur J. Relph, Government Printing Office, Melbourne.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, January 9, at 66, Russell-square, W.C., at eight p.m. "Toning and Intensification with the Salts of Copper," by W. B. Ferguson, M.A. (Oxon).

PHOTOGRAPHIC CLUB.—Wednesday evening, January 10, at eight o'clock. Mr. Charles R. Rowe will deliver a lecture on "Fair Devon," illustrated by slides. All interested in the county will be cordially welcomed at the meeting.

THE Duke of Portland states that he has received the following telegram from his brother, who is an officer in South Africa with the 10th Hussars: "Please send good telescope." His Grace thinks the publication of this message may be useful as a hint to officers proceeding to South Africa.

THE Waterworks Committee of the Rochdale Corporation have received and considered an application from the Rochdale and District Photographic Society with respect to the charge for water used for photographic purposes by amateur photographers. The Committee have resolved that the present scale of charges for photographic purposes shall henceforth apply only to water used for photography for business purposes.

SOUTHSEA AMATEUR PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The Judges at the Twelfth Annual Exhibition to be held at the end of January will be

Messrs. H. Snowden Ward, H. Symonds, and G. West. Both the latter gentlemen are well-known marine photographers. There are five open classes, and the Exhibition promises to be a big show. All further information and entry forms can be obtained from the Hon. Secretary, 5, Pembroke-road, Portsmouth.

Patent News.

THE following applications for Patents were made between December 18 and December 23, 1899:

STEREOSCOPIC PHOTOGRAPHY.—No. 25,110. "Improvement in relation to Stereoscopic Photography." J. E. THORNTON.

DIPPER.—No. 25,201. "An Improved Dipper for Photographic Bath or Bath for Metals." F. L. ORWIN.

DEVELOPING APPLIANCE.—No. 25,270. "Improvements relating to the Means for Applying Photographic Developer Solution or other Liquids to Prepared Surfaces." Communicated by C. W. Earle. J. WETTER.

CAMERAS.—No. 25,299. "Improvements in Photographic Cameras." Communicated by the Vive Camera Company, United States. E. EDWARDS.

FILTERS AND HALF-TONE SCREENS.—No. 25,304. "Improvements in Combined Ray Filters and Half-tone Gratings for Use in Photo-mechanical Processes." J. OWEN.

ARTIFICIAL-LIGHT PHOTOGRAPHY.—No. 25,369. "Improvements in and connected with Apparatus for the Exposure of Films or Plates to Artificial Light for Photographic Purposes." Communicated by A. H. Spurr and W. V. McQuoid. Complete specification. J. G. LORRAIN.

FILMS.—No. 25,383. "Improvements in or relating to Photographic Films." J. E. THORNTON.

CAMERAS.—No. 25,394. "Improvements in Photographic Cameras." Communicated by E. Guilleminault. G. C. MARKS.

ROCKER.—No. 25,404. "Photograph Developing Tray Rocker." J. H. CLARKE.

COLOUR PHOTOGRAPHY.—No. 25,474. "Improved Apparatus and Process for Use in Colour Photography and the like." A. HOFMANN.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
8.....	Bradford Photo. Society	Ladies' and Children's Evening.
8.....	Camera Club	Five European Capitals. Lamond Howie.
8.....	Whithy	Lecture: Negative-making.
9.....	Hackney	Sandell Films and Plates. T. K. Grant.
9.....	Royal Photographic Society	Toning and Intensification with the Salts of Copper. W. B. Ferguson, M.A. (Oxon).
10.....	Ashton-under-Lyne	Exhibition of Members' Lantern Slides.
10.....	Borough Polytechnic	Anastigmat versus Rectilinear Lenses. Albert T. Harris, F.S.M.C.
10.....	Croydon Camera Club	Lantern Night.
10.....	Edinburgh Photo. Society	Portraiture at Home. F. P. Moffat.
10.....	Photographic Club	Fair Devon. Charles R. Rowe.
11.....	Darwen	Demonstration: Paget Gravura Paper. A. C. Baldwin.
11.....	Leigh	Sandell Plates and Films. J. T. Sandell.
11.....	Liverpool Amateur	Demonstration: How to Photograph Microscopic Objects with an Ordinary Camera. F. W. Saxby.
11.....	Oldham	In Search of the Picturesque. J. W. Wade.
12.....	Ashton-under-Lyne	Elementary Photography Class.
12.....	Borough Polytechnic	Practical Evening: Exposure.
12.....	Bristol and West of England	Annual Meeting.—A Trip to Norway, Spitzbergen, and Iceland. T. Butler.
12.....	Croydon Microscopical	On Development. A. Watkins.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 2,—Lantern Meeting,—Mr. J. J. Vezey in the chair.

AN ALPINE EVENING.

MR. HENRY SPEYER gave a lecture entitled, "Round about the Matterhorn and the Aletsch Glacier," which he illustrated by 130 lantern slides from his own negatives. Mr. Speyer's alpine photographs are exceptionally fine, and the Committee who have the arrangement of the lantern meetings of the Society were well advised when they invited him to show a series of his views of the neighbourhood of the Matterhorn, a locality with which he is, apparently, quite as well or better acquainted as with the squares of Bloomsbury. An intrepid and enthusiastic mountaineer, and also a very painstaking photographer, Mr. Speyer is remarkably successful in securing adequate representations of the subtle and delicate gradations of light and shade which abound among the mountains and glaciers of the Alps, and all who have had the pleasure of seeing his slides are loud in their appreciation of the wonderful manner in which he is able to represent the transparency of great walls of ice, the awful grandeur of lofty snow-clad peaks, the shimmering whiteness of the snow-fields, and the glaciers, and seracs, and cornices, and other elements of danger which are so dear to the true climber. The slides exhibited on this occasion dealt first with the scenery in the neighbourhood of the Schwartzee Hotel, above Zermatt, in which there were in-

ided views of the Matterhorn, Gabelhorn, the Misshabel group, the Breithorn, the Theodule Pass, the Dent Blanche, and these were followed by photographs taken from the Riffel Hotel as a centre. Ascents of Castor and Pollux, the Dent Blanche, the Lyskamm, the Matterhorn, and other mountains, were very fully described and illustrated, together with an exploration of the greatletsch glacier from the Eggishorn Hotel, the long succession of beautiful pictures being received with the greatest interest by a crowded audience, who were evidently delighted at the "show." Mr. Speyer said that nearly all of the negatives were taken with a stand camera on thickly coated slow cut m's and developed with pyro ammonia, the slides being made on gelatine plates, which he preferred to collodion.

COMING EVENTS.

January 9, Ordinary Meeting, "Toning and Intensification with Salts of copper," by Mr. W. B. Ferguson, M.A. (Oxon). February 6, Lantern Meeting, subject to be announced.

Southsea Amateur Photographic Society.—At the last meeting the HON. SECRETARY read a lecture on

HOW A LENS IS MADE.

introducing his subject, the lecturer invited his audience to accompany him on an imaginary journey through the lens factory of C. P. Goerz, and follow the various manufacturing stages, commencing with the raw blocks of glass and ending with the testing of the finished lens. The Goerz Works were founded in the year 1883, when three men only were employed, and their rapid progress since is one of the most remarkable stories of commerce. At present the works at Berlin are the largest of their kind in the world, and, when the extensions now in progress are completed, will accommodate 1200 workmen. Each block of glass when received at the lens factory is carefully examined, and a sample prism made from which the refractive power of the material is determined. Mathematicians then calculate the exact curves of the lens interfaces. Each lens is made from calculations and drawings made for that one only, and it is this purely scientific work which to a great extent accounts for the apparently high prices of the objectives. After the lens has been in this manner theoretically designed, its actual construction commences. The lens is roughly shaped and reduced to the form of a disc somewhat higher than the future lens. The flat face of the disc is then roughly ground to the proper curves upon grinders fed with wet sand, the progress of this operation being carefully estimated by gauges and callipers. The blocks of glass are now rendered smooth and clear by fine grinding and polishing, special machinery being used for these operations. No known mechanical instrument capable of taking the measurements necessary for accuracy in the fine grinding, and recourse must be had to a physical method—to Newton's coloured rings, where advantage is taken of the known wave-lengths of light, one of which are but $\frac{1}{1000}$ millimetre. During the process of fine grinding the lens is also constantly examined with test glasses and the spherometer. The second stage of manufacture is now entered upon, the fitting together of the various parts, for each modern anastigmat consists of six, eight, and even more glasses cemented into combinations. The lens is centered and its units cemented together, delicate instruments being employed to judge of correct centering. The finished combinations are now subjected to exact optical tests, and when these are completed are taken to the mechanical department to be fitted into their metal mountings, and in this stage machinery quite as complicated as in the previous is used. The mounted lens is once again thoroughly tested, and the diaphragm scale, &c., engraved upon the mount. The effects of the various stops are also examined. The care taken in manufacturing and the repeated tests ensure that the buyer of a Goerz objective receives a lens which is equal to every purpose to which a lens can be applied, and that no objective sold is inferior to other makes of the same design and construction. The lecturer then threw upon the screen a few of the other specialities of the firm: the Trierer binocular, a very compact field glass of high power, giving remarkably large field with clear definition; the Anschütz camera and shutter, with speeds varying from $\frac{1}{50}$ to $\frac{1}{1000}$ second; and its latest production, a wonderful and effective combination of field glass, opera glass, twin lens and stereoscopic cameras. A number of views taken with the Anschütz and Kodak cameras fitted with the Goerz lens were thrown upon the screen, and gave ample proof that the care taken in the manufacture had indeed produced perfect lenses. The lecturer concluded by exhibiting a striking series of instantaneous photographs. Horses leaping over hurdles and some daring feats of horsemanship performed at the riding school of the Italian cavalry, together with pictures of accidents—of horses rolling over their riders—followed one another upon the screen in quick succession. Instantaneous photographs of this kind, many of which had an exposure of $\frac{1}{1000}$ second, can only be taken with such a shutter as that fitted to the Anschütz camera.

FORTHCOMING EXHIBITIONS.

1900.

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| January | Huddersfield (Invitation). W. A. Beevers. Cloth Hall-street, Huddersfield. |
| ,, 29-31..... | Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea. |
| February 10-24 | Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh. |
| ,, 24-March 3 | Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley. |
| March | South London Photographic Society. |
| April 3-7 | Birkenhead International. C. F. Inston, 25, South John-street, Liverpool. |

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

DR. VON ROHR'S THEORY AND HISTORY OF LENSES.

To the EDITORS.

GENTLEMEN,—My object has been accomplished by the publication of my "Protest" in your issue of December 15.

An important work like that of Dr. von Rohr is not likely to escape the notice of any future historian, and I may expect, too, that my letter will arrest his attention.

Dr. von Rohr is quite entitled to his own opinion, not only of the merits of the late J. H. Dallmeyer as an original thinker in optical matters, but also on matters concerning "good taste." My knowledge of the German language is amply sufficient to find myself in entire disagreement with him here; hence the protest.

I should not have protested if Dr. von Rohr had artlessly recorded the fact that "Mr. J. H. Dallmeyer was a very kind employer," although I should have thought the statement out of place in such a work as his. At best he could only have been told it; it would not have been found in the "sources of information" referred to in the last paragraph of his letter. It is the personalities in his work I do object to most strongly.—I am, yours, &c.

WILLIAM CURRY.

195, Great Portland-street, W.

A PROFESSIONAL'S TROUBLES.

To the EDITORS.

GENTLEMEN,—I read with much interest the many and varied letters which appear from time to time in your much-valued paper, THE BRITISH JOURNAL OF PHOTOGRAPHY, and thought I should like to send you a little of my experience and opinions, which may not prove uninteresting to some of your readers.

Rightly or wrongly, I am often interested and amused at the difficulties some photographers appear to experience in the quick drying of negatives.

I can, and do, dry any negative when necessary within five or eight minutes after taking same from the water. I simply wipe both sides dry as I can with a clean soft duster, and then hold them within about a foot or so of a moderate fire, film away from the fire. I have dried hundreds like this, and have never yet injured one.

In the middle of the summer, when the sun has been very hot, I have placed them in the sun, and by this means have dried them in a few minutes.

I find frequently there is great difficulty in pleasing some of my customers, especially the ladies, for they never require a portrait that bears any resemblance to themselves, but I can produce a portrait that is about a thousand times better-looking than they are, and every wrinkle and pimple removed, crooked noses made straight, projecting teeth removed, big mouths reduced to about two-thirds their size, and every possible defect removed; then they will tell me it is exactly like them, and only one in five hundred will confess that it is too good-looking.

There is a prominent photographer in a town not far away; his work is so retouched that it is only by a very careful study that one can at last determine who they are intended for. Only last week a young lady brought me one of herself taken by him. She was delighted with it, but I was obliged to confess to her that I could discover no resemblance to her whatever. In order to give satisfaction, I am obliged to retouch every bit of the face—nose, mouth, chin, and every other conceivable part, and I expect this is the experience of thousands of other professional photographers.

I tell my customers that the great art in photography is to produce portraits as unlike as possible the persons they are intended for. I photographed an old (and exceptionally plain) lady a short time since. Her age was about seventy. I sent her two proofs, one made to look about sixty years of age, and the other retouched beyond all resemblance—nearly as smooth as a billiard ball. Needless to say, she had a dozen of the latter.

I must not fill up any more of your valuable space; so, with intimating that portraits are mostly frauds, I am, yours, &c.,

A PROFESSIONAL PHOTOGRAPHER.

"FREAK" PHOTOGRAPHY.*To the Editors.*

GENTLEMEN.—In your issue of December 29 you mention a contributor to the *Revue Suisse de Photographie* who states that he has produced a photograph in which a door behind the sitter is seen through him. You say that you are not surprised that the Editors of the journal add that the publication is made "sous toutes réserves." I enclose a print in which exactly the same phenomenon appears. The sitter donned the postman's coat and cap while the postman held the pneumatic ball, the cap being off, of course. I do not think the blind of the shutter leaks; if it does, of course that is sufficient explanation, it may also explain the phenomenon in the case above mentioned. If it is not this, there must be some new X rays to account for it. I may add that the plate was under-exposed, and the development forced as much as possible.—I am, yours, &c.,

J. M. J.

[In the photograph sent the fence shows through the pseudo-postman. We possess many photographs illustrating this phenomenon.—Eds.]

PHOTOGRAPHY AND THE WAR.*To the Editors.*

GENTLEMEN.—Some interesting letters have appeared in the *Pall Mall Gazette* on the question of the use of the camera as an aid to effective scouting, it being suggested that cameras fitted with the tele-photo lens would be serviceable. Is it not a fact that some of the European armies make use of the camera considerably for this purpose? There would be occasions, of course, when the use of the camera would be dangerous to the operator, but an infested country does not necessarily mean that the enemy is everywhere. A photographer could make a dozen exposures whilst a draughtsman is making one rough sketch, although some allowance would have to be made for photographic perspective, which is not a reliable quantity. Some remarkable photographs have been published from time to time, showing the accomplishments of the tele-photo lens.

Modern warfare is a fine art, and, if anything can be utilised to avoid blunders and to bring hostilities to a speedy conclusion, it surely should be made use of.

Perhaps some of the readers of this JOURNAL who may be intimately acquainted with the possibilities of the tele-photo lens will give their opinions, as the matter is surely of considerable importance.—I am, yours, &c.,

J. A. REID.

"Kinraig," Cutcliffe-grove, Bedford, January 1, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

A. J. Ashbolt, 10, Exmoor-road, Southampton.—Photograph of Group of the Southampton Football Club.

A. B. Legard, Sunningdale, Bexley, Kent.—Photograph of Sir Redvers Buller when Lieutenant in the 60th Royal Rifles.

ERNEST OETZMANN.—We reciprocate your good wishes, and thank you for the charming little photogravures.

FILMS.—H. W. Neither of the two new films named is yet fairly on the market; but we have little doubt that the makers of them will let you have some to experiment with.

CRACKED CONDENSER.—J. R. B. asks the cheapest way to get a fresh lens to replace one that is cracked in the condenser.—Any optician will refit the condenser with a new glass. The cheapest way, probably, will be to get it done by those who supplied the lantern.

REMOVING PAINT FROM STUDIO ROOF.—W. P. asks: "The best way to remove paint from the glass of his studio, which is at present painted all over."—Apply to the paint a strong solution of pearlashes, or, better still, American potash. In a little time the paint will be sufficiently softened to be scraped, or washed, off. Care should be taken not to get the solution on to the skin of the hands.

SITUATION IN PARIS.—E. T. 1 and 2. So far as we are able to form an opinion, the demand for English operators in Paris is extremely limited. Your chances of success are small. 3. *Moniteur de Photographie*, 55, Quai des Grandes Augustins, Paris. 4. Unable to say, probably in early spring. 5. The lady's chances are exceedingly remote; at present we strongly advise you and her to give up the idea.

COLLOTYPE PORTRAIT.—J. CASSIE asks: "Can you tell me by what process the portrait enclosed herewith is produced? I say it is an albumen print of the ordinary kind, but I am told it was done by some mechanical process, which I cannot believe."—The print is a collotype, glazed so as to resemble a silver picture. It is, however, better than the majority of collotype portraits produced in this country.

LACK OF WHITES IN BROMIDE PRINTS.—W. CHARLES asks: "What is the cause of all my bromides having no pure whites in them? I use —'s extra-sensitive paper, and have more bromide of potassium in the developer than that given in the formula."—The cause is that too strong a light is used in the development, or, maybe, the paper has been fogged by exposure to light. Extra-sensitive paper wants more careful protection from light than slower ones.

SPOTS ON NEGATIVES.—W. BENN asks: "Will you please tell me the probable cause of the small black spots on this negative? I have been much troubled with them of late, and they do not show when the negative is first finished. They seem to make their appearance only when it is dry."—The spots are due to particles of dust settling on the negatives while they are wet. Many of them can be removed by a little friction, leaving the negative intact. Remedy: Shield the negatives from dust while they are drying.

STAINED NEGATIVES.—D. BARKER says: "Kindly let me know the cause of stains on all the negatives that I intensify with mercury. They all go like the one herewith. I am told that they are caused by the hypo not being washed out; but I know that is not the case, because I always wash the negatives for two hours in running water."—The stains, no doubt, arise from the negatives not being sufficiently fixed in the first instance. Unless that is done, no amount of washing will remove the hypo salts, and then stains will result.

STUDIO BUILDING.—J. T. says: "My intended studio is only sixteen feet in length; but still I should like, if possible, to use a long-focus lens. I have thought of overcoming the difficulty by having a door in the centre of the end of studio, so that I could get as far away from sitter as I wished; it being on the ground floor, and on my own premises, I could, of course, do this. Could as good results be obtained in this way as in a large studio?"—Yes; but it will be advisable to shield the camera and lens with an overhead screen, to stop off some of the intervening light.

BLACKING INSIDE OF CAMERA.—N. COOPER says: "I have just bought a box camera (an old one) to use for enlarging with. Will you please tell me the best way to reblack the inside, as the old blacking seems to have disappeared almost entirely?"—Take some lamp black, or, better still, "drop black," and mix it with French polish diluted with methylated spirit, and apply with a brush. The more polish that is used, the less dead will be the surface. A few trials will show the best proportions to use. If French polish is not at hand, ordinary negative varnish may be used instead.

CRACKED ALBUMEN PRINTS.—S. R. OSMAN sends some prints on highly albumenised paper, and asks the cause of the fine scratches on them, saying that every care was taken that the paper was not scratched during the manipulations, and neither did the scratches show until the prints were dried and ready for mounting."—The so-called scratches are really cracks in the albumen. They are caused by the prints being allowed to curl up while drying, and then uncurling them in the dry state. They may be avoided by drying the prints between blotting-paper, so that they are kept flat. Another way is to mount the prints while they are wet.

COPYRIGHT IN FOREIGN PHOTOGRAPHS.—A. R. T. writes: "There are a large number of photographs of the paintings in the Continental galleries, taken by two or three German houses, on sale here. Is there anything to prevent me from copying them, for sale, as transparencies for the lantern? I cannot find that they have been made copyright at Stationers' Hall, but searching there seems very much like hunting for a needle in a haystack."—If the pictures are copyright in Germany—and there is little doubt that they are—they are also copyright here, without their being registered at Stationers' Hall.

COMPOSITION OF FORMULA.—INVESTIGATOR says: "I have to make up of a formula worded as follow: Water, 150 c.c.; bichrom. potass. $6\frac{1}{2}$ grammes; brom. potass. $1\frac{1}{2}$ grammes; citric acid, 25 drops. Will you kindly inform me as to the probable strength of the citric acid solution, or, in other words, how many grains will 25 drops be the equivalent of in pure solid citric acid?"—We have no idea, as the strength of the citric acid solution is not given. Probably the original formula, as written, gives the strength of the solution; if it does not, we are sorry we cannot help, as it may mean anything from a saturated solution to a very dilute one.

VARNISH.—MAGNESIUM POWDER.—VARNISH says: "1. I enclose a small bottle of varnish, I should be much obliged if you could tell me what it is made of. It is generally known as 'lac,' or stopping-out varnish, and is used by etchers on copper. 2. Do you know of any flashlight formula that avoids the white dust after the explosion? I have used magnesium powder and chlorate of potash on gun-cotton. 3. Is this very dangerous?"—1. We do not know the formula by which the varnish sent is compounded. It is probably a solution of shellac in spirit—with, perhaps, other resins—tinted with a black pigment. 2. No; but, by substituting aluminium for the magnesium, there will be less smoke. 3. Yes, unless used with the greatest care. See Leaderette on another page.

** Several answers to correspondents, Editorial Table, and other matter unavoidably held over.

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EX CATHEDRA.

IT is announced that the Annual Exhibition of the Royal Amateur Society (President, Her Royal Highness the Princess of Wales) will take place towards the end of March. Half the proceeds will be given to Lady Lansdowne's Officers' Families Fund. The Loan Annexe, under the management of the Dowager Lady Newton, will comprise old miniatures on ivory of all countries, with a few specimens of pinchbeck and a collection of photographs by members of the Photographic Salon.

* * *

THE daily papers state that the retiring President of the Royal Photographic Society (the Earl of Crawford) is to receive from the Wigan Corporation the freedom of the borough in celebration of the twenty-first anniversary of the opening of the Free Library (of which he is Chairman), and in recognition of his Lordship's services as scientist and bibliophile and his many valuable gifts to the Library.

* * *

The King, the newest of Messrs. George Newnes' many periodicals, relies for its illustrations upon photography to a

greater extent, if it be possible, than any other of the weekly illustrated papers. A feature is made of the war photographs sent home from South Africa by the King's special correspondent at the front, Mr. H. C. Shelley, who is well known to many Glasgow and London photographers. Mr. Shelley is an excellent type of the photographer-journalist, who appears to be meeting with great success in his profession, which, just at the present time, is perhaps somewhat hazardous.

* * *

BY the death of Mr. Henry Tracey Coxwell, who lately expired at Seaford in his eightieth year, one of the famous balloonists of the century has passed away. He made hundreds of ascents, some of which have become classical. On September 5, 1862, he and Mr. James Glaisher, F.R.S., the still living past-President of the Photographic Society of Great Britain, created a record by rising to a height of seven miles. After a time, the valve line having become entangled owing to the rotatory motion of the balloon, Mr. Coxwell had to leave the car and mount to the ring; but there was hoar frost all round the neck of the aerostat, and the moment his hands touched the metal they were frost-bitten and rendered useless, so that he had to put his arms on the ring, and in this way drop back into the car. In the mean time Mr. Glaisher, who had observed that they had attained a height of 29,000 feet, found his sight affected, and soon afterwards his arms fell powerless; then he seemed to have no limbs at all, his back and neck lost all muscular power, and he became unconscious. This was the condition in which Mr. Coxwell, on reaching the car again, his own hands powerless, found him. Happily Mr. Coxwell was able to seize the valve cord with his teeth, and some vigorous pulls speedily brought them into a warmer temperature, when Mr. Glaisher recovered and was himself able to attend to his colleague.

* * *

AMONGST the gentlemen whom Her Majesty has been pleased to approve, on the recommendation of the Lord Chancellor, for the appointment to the rank of Queen's Counsel is Mr. W. B. Ferguson. Well known as an active member of the Royal Photographic Society, the new Q.C. further demonstrated his interest in photography by reading at the Society's meeting, on

Tuesday evening last, a paper on "Toning and Intensification with the Salts of Copper," a report of which we print elsewhere.

* * *

SOME of our American contemporaries and several correspondents of our own have adversely criticised the printing paper "combine" known in the States as the General Aristo Company, which has control of the whole output of photographic printing papers on the other side. It has been suggested that the concentration of all the manufacturers' interests has operated disadvantageously both to dealers and consumers; but Mr. F. J. Ibbetson, of Messrs. J. J. Griffin & Sons, who has just returned from a business visit to the States, puts a different complexion on the state of affairs. The combine, he tells us, has stopped cutting in the trade, and has not raised prices to the consumer. He is of opinion that it is working very well for all concerned. This impartial view of the matter should reassure those who have feared that the combine in question was a tyrannous monopoly.

* * *

INTO the illustrated notice of the Tella camera, which appears at pp. 898-900 of our ALMANAC for 1900, a strange block, by one of those accidents which will occur in the best regulated of printing works, unfortunately found its way. The immediate result was a considerable number of inquiries addressed to the Tella Company within a few hours of the publication of the ALMANAC, as to whether the construction of their highly popular hand camera had undergone some alteration as regards its external appearance. We have to express our regrets to the Company, as well as to our readers, for the intrusion of this misleading block, which, at least, has had the compensating effect of endorsing the popularity of the Tella hand camera, and of proving with what attention and closeness the pages of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC are perused by its readers.

A POINT IN CONNEXION WITH THE RIGHT TO THE NEGATIVE.

SINCE the article on the right to the negative appeared in our issue for November 17, and the reserved judgment in the case then before the Yarmouth County Court has been given, we have been asked questions on one or two points in connexion with the photographer's right to the negative when taken under other conditions. One correspondent says, in effect, that although there is no question that a portrait negative taken in the studio, in the ordinary course of business, is the property of the photographer, it may not be the case when groups and the like are taken at customers' own houses, or when, for instance, the photographer goes a distance to take a building, or photograph a ceremony, and charges his travelling expenses in addition to those for taking the photograph.

One correspondent writes as follows: "Some time back I was engaged to take photographs of a wedding party some miles from my place of business. I charged so much for attending and taking the picture, and so much for travelling expenses. When I sent in the proofs and the bill, the party would not pay unless I gave up the negatives. They said, as I had charged them for taking the pictures, and also charged them with my travelling expenses to do the work, the negatives were their property, and, unless I gave them up, they would

not pay the account. As I could not get the money, and did not wish to try the matter in the County Court, I gave up the negatives, and they paid. The negatives were then sent to another photographer to print from at a less price than I charge." Our correspondent now asks if he did wrong in giving up the negatives, and if a similar case had been decided in Court.

Here the photographer did wrong in handing over the negatives, as they were his property. A very similar case to this was decided some years ago (in 1884) in the Swansea County Court. This case was briefly referred to in the previous article. It was this: the claim was for something over 10/-, about half of which was for "photographing" a vessel with officers and men on board, the other half being for duplicates supplied. The latter claim was paid into Court, and the former contested because the negatives were not given up to the defendant. His advocate contended, with some ability, that, as a definite charge was made for "photographing" the vessel, &c., the negatives became the property of the customer. But this argument did not avail, for the Judge was evidently aware of the custom of the trade in photography, and found for the plaintiff with costs. During the arguments in the case the Judge remarked that the negative should be looked upon as one of the photographer's instruments of trade, adding that "a negative may be a secret in his trade, and he does not part with it unless there is a contract to that effect." Leave to appeal was asked for and granted, though at the same time the Judge said, "I think it will be useless to appeal." The appeal was not, however, proceeded with.

The case detailed by our correspondent is one precisely on all fours with that just quoted, but we are not at all sure that every County Court Judge would take the same view of the case as did the one at Swansea, hence the present article.

Litigation in all cases is best avoided if possible. In the case recently tried in the Yarmouth County Court, for example, the Judge at the first hearing said that he was of opinion that the negatives were clearly the property of the customer, adding that "it was just the same when one had a plate engraved for cards;" though, after he had seen previously decided cases, possibly those we had quoted, he found himself in error, as he gave a verdict for the photographer.

What we should advise, with the view to avoiding litigation in any way, is in all instances to make no definite charge in any shape whatever for taking the negative, or for photographing, but merely charging for what is actually supplied. When the work is done away from home, the invoice should be made out in some such form as this: To so many photographs of groups, or whatever it may be, so much; travelling expenses, so much; so many duplicates, so much. Then the charges are made for only what is actually supplied to the customer, and for nothing more. We are quite aware that many photographers, like solicitors, make out long wordy accounts, with the view to make the work done appear as large as possible; but, in the case of photography, this may prove a mistake, as it may lead to unpleasant misunderstandings, and perhaps something more with litigiously inclined customers.

Our object here is to impress upon our professional readers, as we have done on more than one previous occasion, that in making out their charges they should charge only for what is actually supplied, with, of course, travelling and similar out-of-pocket expenses, without any allusion whatever to anything else. Any reference to taking negatives, photographing, or

he like, should be studiously avoided, for, notwithstanding the decision in the Swansea case, as we have just intimated, disputes or litigations may arise, and they, in any form, even if they are successfully contested, are best avoided.

The Solar Eclipse.—Preparations are going on apace with regard to the observing of the eclipse on May 28 next, and, as the distance to be travelled in order to be in a suitable position is very small in comparison with the requirements of the last eclipse, it is probable that large numbers of astronomers will take advantage of his opportunity. The British Astronomical Association have made such arrangements that, if the requisite number of observers give in their names, the Royal Mail steamer *Tagus* will be chartered. It is then to start from Southampton on May 18 at 6 p.m., and is to call en route at Cadiz and Alicante, and arrive at Algiers 6 a.m. on Thursday, May 24. The plan of operations is for the observers to form three groups to carry on operations: (1) in the interior of Spain, (2) at Alicante or its neighbourhood, (3) in Algeria. Those who elect to observe in the latter region will have the advantage of being able, if they wish, to use the ship as an hotel.

Photographs of the New Moon.—Many of our readers will be familiar with the phenomenon of the "old moon in the young one's arms," as the effect of the slight visibility of the so-called non-illuminated major portion of the satellite's surface embraced as it were by the luminous portion, apparently part of a space of larger area, is termed. On some occasions the dark part becomes extremely clearly discernible to the eye, and recently some excellent photographs have been taken of the whole surface. In the *Bulletin* of the French Astronomical Society for last month an article is devoted to this subject, and is illustrated by an excellent photograph, thus showing that the visibility is a true objective phenomenon, and not an optical illusion. We may note that the real cause of this visibility of the dark part was for a long while unknown. The eminent astronomer, Tycho Brahe, thought that it was produced by what might be termed Venus shine, but Leonardo da Vinci, that marvellous genius, as eminent in architecture as painting, and in astronomy as in architecture, clearly pointed out the cause as being earth shine, i.e., sunlight reflected from the earth onto the moon, just as the moon reflects the light received from the sun on to the earth. The French term the effect *la lumière cendrée*.

Celestial Photography.—This branch of astronomy has, says the *English Mechanic* in its annual review, advanced "at a surprising rate, and the sensitised plate is taking the place of the human eye in numerous directions. The astrographic chart and catalogue proceed apace, and the sun is photographed whenever he is visible at Greenwich. Dr. Roberts's superb photographs continue to be taken with undeviating regularity, and we hear that a second of the invaluable volumes issued from the Crowborough Observatory is to appear immediately. Perhaps there is no more curious story in reference to the photography of the sky than that of the Crossley reflector now at Lick Observatory. Purchased originally from Dr. Common by Mr. Crossley, the three-feet reflector never did any good in its new possessor's hands; not even after he had had it refurnished by one of our most eminent opticians were its capabilities to any extent developed. Now at Lick it seems to have found its *métier*, and, in the hands of Professor Keeley, to have produced results of the highest value."

Preserving of Brasswork from Corrosion.—The writer in the above journal, whose letters appear over [the signature of "Glatton," makes some very suggestive remarks upon this subject. He points out that, in a paper published by the Society of Arts, the lecturer called attention to the fact that the varnish used by the old masters was absolutely damp-proof, but that the kind used by the

moderns was not absolutely so. He concluded that damp was the cause of faded pictures, and he endeavoured to find a damp-proof varnish. As he found that such a varnish was not commercially obtainable, he set to work to discover the best way to make one himself. He found that the damp penetrated through minute pores or holes in the varnish, and the problem that presented itself was how to prevent these pores forming. His method of testing was to dehydrate some cupric sulphate, which then lost its blue colour and became white; this he mixed with the varnish to be tested and then painted a glass slip with the compound. If water gained access through the varnish, it was absorbed by the copper salt, which again became blue; but, if it retained its whiteness, it was non-porous. A large number of varnishes were tried, but none answered the test till he added Venice turpentine. Then the secret was discovered. A very small quantity of this substance added to the varnish conferred the property of impenetrability to moisture. The writer suggests that, if added to lacquer, it might still further add to its value and render it damp-proof. It is well known that, although a lens mounting, for instance, will keep intact under ordinary conditions, the time comes when, if it be exposed to damp, or more especially to chemical fumes, the varnish or lacquer is penetrated, and the instrument becomes rusty-looking and pitted through corrosion of the brass. Again, if the addition answered in one case, it ought to do so in another; and the one fault of shellac varnish, its easy penetrability to water which has obtained accidental access to it, might be removed.

It must, however, be pointed out that care should be taken that the genuine Venice turpentine be used, for a very large quantity of that purchasable at the chemists' shops is merely a solution of common residue in turpentine.

JOTTINGS.

WITH poor Belton, who died so suddenly the other day, I had many a pleasant hour—many a useful talk on photography—in past years. As far back as 1832 some of his New Forest landscapes were hung at the Photographic Society's Exhibition in Pall Mall. Printed and framed according to the most modern ideas these sylvan studies would bear comparison with much good work of to-day. I believe Belton was the first to photograph the sea of faces in Fleet-street on a Derby afternoon anxiously gazing towards the windows of the sporting newspaper offices for the result of the greatest horse race in the world. The photograph caused a mild sensation at the time. He belonged to the school of photographers which was formed in the early sixties, and, though he was less fortunate in the bitter battle of life than many neither so deserving nor so competent, he will be long remembered for many excellent personal qualities, and by nobody more kindly than the writer of this paragraph.

THE widespread anxiety of the nation to help the sufferers by the stern war in South Africa hardly appears to have reached photographers as a class. One society—the Southsea—has raised £57. as the result of a lantern lecture, but that is all. I believe that, if the scores of societies who hold lantern evenings in the winter would follow the lead of their Hampshire brethren, a very respectable sum would be raised and added to the war funds. It is not too late for something to be done. The war has only just commenced, and we have not yet reached mid-winter. My friend, the admirable Mr. W. E. Dunmore, of Tella Camera celebrity, has lived in South Africa, and he (and doubtless other photographers similarly experienced) might be disposed to help with local information at any lantern lectures which took the district of the battlefields as a subject for illustration.

"ANASTIGMAT versus Rectilinear Lenses" is the title of a paper read one night this week before the Borough Polytechnic Photographic Society by Mr. Harris. But at what points do anastigmatism and rectilinearity antagonise? In no class of camera work

is either of these valuable optical properties a disadvantage, so that to pit the one against the other serves no purpose that I can discover. I imagine, however, that the author of the paper intended to discuss the relative merits of lenses giving round and flat fields respectively. That is a horse of another colour. Lenses having an appreciable amount of curvature will always be useful for such subjects as interiors, street views, &c., offering a field concave to the lens, while for transmitting a plane image of a plane surface a flat field lens is essential. Lying between these two propositions there may be some ground for discussion, but not so, my dear Mr. Harris, with regard to anastigmatism and rectilinearity. Curvature, though an optical fault, may in most cases be no practical drawback, but a lens which either distorts or will not focus for the oblique rays must be a very poor thing indeed nowadays.

I HAVE been asked for the address of a maker of stereoscopic slides from professionals' or amateurs' negatives, but I know of no trade photographer who undertakes such work. I mention the fact, because possibly there might be an opening for a photographer who would lay himself out to make a speciality of preparing binocular slides and transparencies. There is so much stereoscopic photography done nowadays in a quiet way that the hint I am giving is certainly worth attention. It is not always a thankful task pointing out where demand awaits supply. Some years ago, in this column, I advised photographers to take up the preparation, or, at any rate, the furnishing to their clients, of note-headings, cards, and so forth, with half-tone views or portraits printed on them. A contemporary writer jeered at the idea, but to-day the production of half-tone illustrated stationery has reached the dimensions of a respectable industry. In the picturesque village where I live the stationer advertises and sells the little local half-tone views, and the photographer's window is barren of them. By rights, of course, it should be the other way about.

NEXT to the virtual impossibility of having stereo slides made commercially lies the difficulty of getting the prints themselves properly mounted and transposed. Not half-a-dozen trade printers in the country would be equal to the task, I am sure. Quite recently I hurriedly wanted something like a hundred binocular prints cut, trimmed, transposed, and mounted. It was a little job which, from past experience, I knew I could not get through under several evenings; but it was perfectly done for me in twenty-four hours by Messrs. E. Fox & Co., of 12, Little Britain, E.C. For print-mounting of all sorts, probably no firm is so cleanly and so expeditious as Messrs. Fox. It is many years since I first handled any of their work, so that, in the words of the sporting writers, I am putting my readers "on to a good thing" if they will intrust the mounting of their photographs to Messrs. Fox.

CONCERNING the mounting of prints, photographers might, in many cases, borrow a hint from some of the publications which give photographic pictures as frontispieces or illustrations. No less than five of these periodicals simply mount the prints by the edges, so that there is virtually no contact with the support, and thus between the latter, the mountant and the silver image, no chemical action takes place. Such a plan may reasonably be supposed to conduce to the permanency of the image. At least one well-known London photographer attaches his prints to the mounts in this way. It is, perhaps, not practicable for *carte-de-visite* surface prints and other small work, but has a very great deal to recommend it for the better class of larger-sized platinum and carbon portraiture, &c.

THE arm chair generals and strategists, who have been writing to the daily newspapers about the misconduct of the war and the shortcomings of those who are directing it, may at least be thanked for paving the way to an increase of optical and photographic knowledge on the part of the general public. We were told the other day that the Boer officers were furnished with prismatic binoculars of a power and field not made, and this original misstatement has been the means of informing the public precisely what a prismatic

binocular is, and its uses in spying out the land in military operations. Again, some nonsensical suggestions that "snap-shot hand cameras" (*sic*) with lenses of five or six inches focal length would be of use in photographing an enemy's intrenchments at a distance of several miles have led to the publication of some authoritative information about the only system that would be of use in such a case, viz., tele-photography.

A PERUSAL of some of the letters to which I have referred might, however, lead the public to suppose that the military authorities were not alive to the value of photography in warfare. At this time of national trial it is satisfactory to know that this is not the case. For many years past there has been a photographic branch attached to the School of Military Engineering at Chatham, which has done good work in imparting a knowledge of photography to officers and others. But, indeed, throughout the service balloon photography, tele-photography, and all the minor processes are thoroughly well understood and practised, and the number of officers who are intimately acquainted with the possibilities and limitations of photography in warfare must be exceedingly large. If some of the armchair commanders were a little better informed on the subject, the volume of ignorant criticism just now being directed against the sorely harassed War Office would be appreciably smaller.

COSMOS.

BRITISH PHOTOGRAPHY FROM THE AMERICAN POINT OF VIEW.

[SECOND ARTICLE.]

LAST week we reproduced some interesting, if contradictory, American criticisms on the British photographs lately exhibited in Philadelphia, and in our review columns we referred approvingly to a lengthy notice of these photographs which appears in *Camera Notes* (New York) over the signature of J. T. Keiley. Mr. Keiley's photographic writings, which we have long followed with interest, stamp him as a sincere and well-informed critic. In the belief that his opinions of the British photographs shown at Philadelphia will carry weight with those interested, we here reproduce the essential portions of his admirably written notice:

Of Mr. J. Craig Annan's seven pictures, *A Lombardy Ploughing Team*, No. 14, alone was pre-eminently great, and worthy of its eminent reputation. This picture is too well known to need any description, and too perfect a thing of its kind to call for any criticism. Not so, however, *The Church or the World* (No. 13), which was the sheerest travesty. It presented to us three damsels, two apparently in hooded mackintoshes, presumably intended for *religieuses*, and representing the Church, leading through a forest or garden a little pony, on which the third was seated arrayed in spring attire. Just which one of these two latter was intended to represent the world was not apparent. A fair observer, with a *bonbonniere* in her hand, who paused before the picture as I was examining it, made the only kind criticism to which the picture was open. She looked at it a moment, and exclaimed ecstatically, "Isn't he just too 'cute' for anything, that little pony?" *A Lady in White* (No. 12) was simply a Davis & Sanford of a girl, a shawl, a table, and some ornaments, framed very handsomely in black and gold. I failed to see anything remarkable in Mr. Annan's picture of Miss Ellen Terry (No. 9), but one day, while standing near it, I was enlightened as to one of its charms by a dapper little gentleman, nattily dressed, and distinguished from the common crowd by a flower in his buttonhole, dove-coloured spats, pointed beard and curved moustaches, and silk-ribboned eyeglasses, who, designating the picture by a graceful and comprehensive hand and arm movement, exclaimed to his friend, "Isn't she sweet? I bought that;" and thereupon the two fell to discussing the legitimacy of some of Mrs. Käsebier's work. No. 10 was the picture of a woolly palette with a man alongside of it.

Pictures by Karl Greger: (No. 144) *Afterglow*, (No. 145) *Suffolk Meadows*; (No. 146) *Dreamy Marshland*, (No. 147) *A Woodland Pond*, (No. 149) *Evening Before the Day of Rest*, were little better than space-filers. No. 148, however, *The Playground of Wind and Waves*, showed rather nice-feeling, although the tone was rather leaden; this, however, may have been due to the glass. The sea in this picture is too solidly rendered. I should remark of picture No. 146, a picture of sheep with heavy storm clouds darkening the sky, that the sheep threw strong sun-shadows.

My Lady's Garden (No. 188) was, without doubt, the best of the five pictures shown by Alexander Keighley. The picture was distinctly English in its type, and the sky portions and overhanging trees that break and shut out part of the sky were classically rendered. The idea conveyed to the observer in the contrasted forms of the grim old sun-dial on the one hand, and on the other the peacock and handsome flower-icker, both with their backs to the dial, is a very poetic one. While there were certain things that I did not like about the picture, I think that, on the whole, its composition was good, and that it had the merit of being a successful, a pleasing picture, if not a great one. In *Father ye Roses while ye may, Old Time is still a-flying* (No. 192) Mr. Keighley also displayed much poetic feeling. His other pictures (No. 89), a railroad photograph; (No. 190), a picture of rays of light that skip over places; and No. 191, are a different class of work, and only passably interesting.

As a member of the bar I could not fail to entertain a certain professional admiration for Mr. Crooke's pictures of *Lord Kinnear* (No. 86), *Alexander Carle, Esq.* (No. 87), and *Sheriff Comrie Thompson, Q.C.* (No. 88), they so entirely resembled modern reproductions of the old time-tarnished prints of barristers, solicitors, queen's counsellors, and lords chief-justice that we lawyers are so fond of ripping out of old books, ramming in the stiffest manner possible for dignity's sake and hanging in our offices for the purpose of spurring us on to perpetuate ourselves in like manner, and incidentally to excite a proper sense of awe and respect in the breasts of our clients by impressing them with the fact that we attorneys belong to a superior and gifted class of the community—its intellectual and linguistic aristocracy, so to speak. Those pictures were full of that professional dignity and superiority that the lawyer so loves, and if there be any among my readers who, having seen Mr. Crooke's photographs, are inclined to question the truthfulness of their portrayal of those characteristics, let them call to mind if they know him, and if not let them seek out our own esteemed fellow-citizen and international celebrity, for I understand that he has of late purchased a castle and estate in Ireland, the Honorable Barrister Nolan, of the New York bar, when all doubt will vanish into thin air. But we all have it in greater or less degree, we lawyers, down to the merest little popinjay of a shyster, whose knowledge of law would scarcely fill a thimble. Indeed, I have long since come to believe that it is this divine characteristic of personal and intellectual superiority (in judging of this we, of course, act as our own judge and jury), which inclines us to the study of the law. To medicine, of course, we could never take, for, eminently respectable as it is to-day, we cannot forget that in its pristine simplicity its profession was part of the repertoire of that loquacious and menial member of the community, the barber, and that originally the medico's coat of arms consisted of three pills rampant on a soup plate pendant with a semi-circular fragment chipped out of its upper edge. Mr. Crooke's pictures were, from a technical point of view, beautiful pieces of work. The background consisted in most cases of a heavily draped window, and the view out of the window was cleverly varied in the different pictures by the use in the aperture of the window of a series of out-door views that just filled with precision the space to be covered.

Mr. Job's picture, *Snow and Sunshine* (No. 170), was disturbing because of its sky, whose clouds were unpleasantly like puffs of cigar smoke.

Farmstead (No. 19), W. S. Ashton, was spoiled by too much foreground. Otherwise the picture was well spaced and its general effect pleasing.

The Quay Side (No. 169), Job, is a subject very similar to a picture by Mr. Russell shown in the same Exhibition. The latter picture was handled with a delightful appreciation of the picturesque possibilities of the subject, and, while by no means a masterpiece, was certainly a very decorative bit, full of refinement and feeling. Such was not the case, however, with print No. 169, which was neither vague enough to excite the imagination, hard enough to shock, nor picturesque enough to attract—in a word, it was simply a good photograph.

Of Mr. Mummery's two pictures, that entitled *Unveiled her peerless Light*, and *O'er the Dark her Silver Mantle threw*, No. 231 alone seemed to call for special notice. It was so framed and matted that its really great charm almost escaped me. Executed in soft blacks and luminous greys that had all the quality of charcoal, this little night scene is truly nocturnal in its feeling, and it certainly stood in a class by itself. Some who looked at it objected to the brightness of the rising moon. For my own part, I found nothing to object to in this or in anything else in the picture except the artist's printed name on the lower corner of the print, which, besides not being in the best of taste, was most injurious to the picture because of the rigidity and heaviness of the letters.

In *Afternoon* (No. 217), Viscount Maitland; *On the Way* (No. 218),

Maitland; and *Suffolk Lowlands* (No. 227), L. Morgan; *An Outcast on the Essex Saltings*, No. 228 (L. Morgan), the sky portions of the pictures seemed to clash with their other parts, and this is a fatal defect, as harmony of parts is one of the essential elements of a perfect picture. This clashing was especially noticeable in No. 218. When we behold such a sky as this in nature, the foreground, with all of the details, is taken in by the eye only as an incident, and appears as a massing of shadowy lines and forms against the sky beyond. In this picture, however, the foreground has been rendered with painful exactness. The resulting effect is extremely disturbing and unpicturesque. No. 228 hardly tells its own story.

Of the seven pictures shown by A. Horsley Hinton, *Sylvan Solitude* (No. 162) appealed to me the most strongly. Indeed it has left a more permanent impression than any other picture by him that I have yet seen, and has caused me to regret that I am but indifferently familiar with his work. If I am not greatly mistaken, it is a picture that one could live with, and grow fonder of, with more intimate knowledge of it, which, after all, is the crucial test of the depth of a picture—and which cannot be said of the majority of the few pictures of Mr. Hinton which I know. The picture presents to us a forest hillside, well wooded with ancient trees that outline their majestic forms against a sky that hints of advancing night or coming storm. The sloping hillside is carpeted with soft grey moss that has all the appearance of never having been disturbed by the foot of man. One cannot look upon this picture without feeling the peace of such solitudes as this, where no sound is heard save, perhaps, the snapping of a dry twig under foot, the song of some forest warbler, or the music of flashing brook, where, far removed from the hardening influence of the tumultuous passions and ceaseless strife of inhabited places, man communes again with mother earth, and through the refreshing and inspiring influence of her sublime beauty feels the nobility of his manhood within his soul, and awakens to the paltry meanness of most of the ambitions of the world.

Of the other pictures shown by Mr. Hinton, *The Headland* (No. 158) was perhaps the most striking—yet neither this nor the remaining pictures gave me more than a passing pleasure. They lack something that is essential to a picture's immortality. Whether it be that they are false in their renderings I am not prepared to say.

There were certain qualities in Italian, French, and English paintings that I never understood till I had visited those countries, though I doubt not that previously I had more than once presumed to comment upon them; and since then, realising how very silly some of my early comments must have been, I have made it a rule never to pass judgment upon that concerning which I am indifferently informed. It is to be hoped that in time certain English and American critics will learn the same lesson.

After the Storm (No. 206), George Lamley, was a satisfactory marine bit, very suggestive of Harrison's paintings of the sea.

J. A. Sinclair's picture (No. 266), entitled *Twilight*, raised a doubt in my mind as to whether my own conception of twilight was the correct one.

Paul Martin's two pictures, *A Frosty Night* (No. 219) and *A Winter's Night on the Embankment* (No. 220), were most interesting, not only from a picturesque but from an historical point of view, as Mr. Martin was one of the first Englishmen to undertake night photography, making his experiments in England at the same time that Mr. Steiglitz was making the initial experiments in this country, each working without any knowledge that the other was labouring along the same lines. Mr. Martin's pictures seemed to me somewhat hard and unatmospheric, otherwise they were quite perfect in their way.

My Nephew (No. 79), Archibald Cochrane, while not as large as his picture of last year, was well worthy of study.

None the less interesting because of its small size was F. A. Bolton's *Shades of Evening* (No. 98). It was a narrow river or canal scene, the stream flowing outwards, so that both banks were visible, and was well treated and showed much imagination and feeling, its pictorial value being pronounced.

Mr. J. P. Croft sent one of his delightfully poetic pictures entitled *On the Hillside* (No. 84), that was full of a vague dreaminess that appealed to the imagination. Like most of Mr. Croft's pictures, it possessed a quiet charm and refined originality that was truly admirable.

Of the two pictures shown by W. T. Greatbach (No. 142), *Sunshine and Shadow*, a woodland bit that displayed no little appreciation of the charm of leaf-filtered light, was by far the best.

J. C. Warburg's *At the Spring* (No. 322) cannot be passed over unnoticed, for it certainly possessed a distinct charm and fascination. Its studied irregularity, its vagueness, its odd side strip, all challenged

attention. Most of those who saw it denounced it at first, but I noticed that later on they went back to it, and that the oftener that they saw it the milder was their condemnation.

Head of a Girl (No. 252), by R. W. Robinson, has certain pleasing qualities of light and line; but, unhappily for the picture, it is sufficiently like, in general effect, to a well-known picture of the fascinating Lady Hamilton, of Nelson fame, to invite comparison to the injury of the photograph. The lower portion of the arm is treated in such a way as to spoil its symmetry and to give it an unpleasant heaviness.

On the Hither Side of Night (No. 253), R. W. Robinson, impressed me as hard, badly handled, and scarcely interesting, and certainly not in keeping with Mr. Robinson's reputation, while *Becalmed* (No. 251) and *The Golden Close of Evening* (No. 254) impressed me as being simply conventional.

Mr. Calland's *Barley Mowers* (No. 74) had in it the making of a very fine picture of country life, but, owing to certain defects of composition, the picture is very badly out of balance; but *In the Row, London* (No. 75), can scarcely be improved upon. The subject is not one that appeals to my personal liking, but, for what it is, it is the best thing of the kind that I know. It is full of character and action, and is treated in a masterly manner that places Mr. Calland in the front rank of serious photographic workers.

Rose Trail (No. 69) and *Vine Leaves* (No. 70), by Carine Cadby, were interesting as delicate colour studies of trailing leaves, and much in advance of most of the painted things of the kind with which I am familiar.

The pictures of H. W. Barnett (Nos. 33 to 39), while somewhat conventional, were executed with great taste and refinement, and evidenced an intimate familiarity with the style of some of England's best portrait painters of the past, both in their style and composition. Several of these pictures were faulty in composition, and one was so trimmed (it was cut in circular form) as to exaggerate the unsymmetrical lines of the composition of the subject, crowding the figure, seemingly, into a very awkward attitude. Of these pictures *Memories* (No. 34), *The Princess* (No. 35), and *Agnes Romney* (No. 36) were much the most attractive. In the case of the picture of the violin-player, the picture was rather unfortunately cut in two by the violin, and most disturbing in its composition in consequence.

Tears (No. 71), Will Cadby, was the photograph of a child partly draped in what appeared to be a portion of a lace shawl or curtain, and supposed to be weeping, from the fact that it had its knuckles screwed into its eyes; while *Blossoms* (No. 72) was a Bergesque production à la Magdalene, which lacked both force and purpose. *There came a Big Spider* (No. 73) can only be described in jingle:—

"A wall with a fall,
A spider dried,
Nude child beside,
Wraps and leaves,
Frame from eaves."

Apropos of the frame, some one referred to the English frames as umber-yards, and I must confess that the characterisation was most apt, for, with some notable exceptions, they were ungainly, massive affairs, made seemingly from the same sort of moulding from which the eaves of old frame houses were constructed.

Mr. Craigie's portrait, *George Batten* (No. 91) was one of the best examples of forceful portrait work shown in the Salon. The head was strong, well poised and lighted, and full of character, without being unpleasantly sharp. The neckcloth and collar seemed to me a trifle brilliant for the subdued tones of the balance of the picture. The framing of the picture was atrocious.

Dr. John Todhunter (No. 126), *G. A. Story, Esq., R.A.* (No. 127), and portrait study, *A Jewess* (No. 128), three pictures by F. H. Evans, were so wretchedly spaced and horribly framed that the observer was tempted to pass them without looking at them twice. A careful examination showed rather good modelling and an evident effort to convey something of the character of the sitter, but, when it comes to giving Dr. Todhunter a complexion as jaundiced as the bindings of some of his illustrious namesake's mathematical works, I think that some one should call a halt. I have since seen this picture reproduced in black and white, and thus rendered and freed from the damning influence of its frame, which was not in evidence in the reproduction, the picture looked vastly better. Picture No. 127 was anaemic in tone, while No. 128 was as chalky as some of England's own cliffs. As fragmentary studies these prints were interesting, as finished pictures they were not.

An Evening Sky (No. 129), also by Evans, suggested possibilities only

to show how far they had been missed; while *In Surrey Wood* (No. 130) is a puzzle picture, which, till closely examined, strikingly resembled a posterior view of a line of ostriches with their heads buried in the ground raising a cloud of dust. The picture is tastelessly matted and framed. In No. 131, *Gloucester Cathedral, in the North Transept*, Mr. Evans was seen at his best. This was really a fine bit of architectural work and worthy of careful study. It is in this work that Mr. Evans is most happy and successful.

As I stood before No. 68, *Le Monde c'est ce qui m'amuse*, A. Burchett, I heard a dainty little lady say, "Nice dress, nice gloves, nice parasol, but her hat! it's shockingly out of style, and I guess she must know it too, she looks so distressed." This, one of the largest pictures shown, was certainly not an example of high art, and the little lady above referred to classed it well; it was little better than a clever fashion plate. Its most distinguished feature was its French title. No. 67, *Caller Herrin'*, A. Burchett, was evidently intended for a character or type study. The motive that prompted the attempt is all that I can commend, for the picture itself was false, posey, and wanting in atmosphere. The girl's eyes were not the eyes of a simple fish-vendor, but of a charming little Miss, who was entirely conscious that she was having her picture taken. Her soft and faultlessly clean hands never carried a fish basket about nor handled fish, and the basket itself is a marvel of cleanliness, bearing never a stain. The spacing of the picture is rather well managed, but the picture, as a picture, is insincere. No. 64, *Winter*, Arthur Burchett; such a title is too comprehensive to be bestowed on a picture like this, which shows merely a snow-covered landscape, in which the snow was badly rendered, the composition poor, and the subject very commonplace. It neither presented nor suggests to the imagination anything of the bleakness of winter, with its whistling winds, its driving storms, its icy whisperings of weird, frozen mysteries, or its prefigurations of death.

The title of a picture will invariably betray how much or how little its maker is in sympathy with his work. It is amusing to note the misfit qualities of many titles; it is depressing and significant also, for such, though it may be pleasing, is never deep, and often not sincere, and it rarely happens that its author ever goes beyond it into higher and nobler fields of intellectual and artistic activity.

Apropos of titles, I quite clearly recall the explanation given by a gentleman well known in the photographic world of the title of one of his exhibits that had caused much speculation among those who had noted it. "After I had concluded to arrange this exhibit thus," he said, "my friend and I got together to select a name for it, and we decided upon this name because we concluded that it would give people something to think about." "Then your title and arrangement was merely an after-thought?" I asked. "Precisely," was the reply. This reminded me of an experience I once had with an Italian who turned plaster into gold by selling casts and plaster reproductions of well-known masterpieces. I had ordered from him a mask of Cicero and another of Demosthenes. When the masks reached me, I had no trouble in recognising the features of the eloquent citizen of Rome, but that of Demosthenes filled me with consternation, for he had lost his beard and grown quite stout. Yet with much eloquence my Italian friend assured me that it was Demosthenes. Despite this fact, however, it has always been my private opinion that the vendor of casts, having discovered that he did not have Demosthenes in stock, had made a plaster cast of the face of his father-in-law, and called it after the Greek. And, after all, as one of the defenders of this method of naming pictures put it, "parents don't name their children till after they are born, especially in America, where to call a boy Marie would mean juvenile persecution on the part of his future schoolfellows, and lifelong impertinence from all the funny people he chanced to know."

To No. 63, also called *Winter*, Arthur Burchett, the same objection applies. As a mere study of trees, the texture was very well portrayed, but the trees themselves were entirely too black and individually too assertive, each demanding separate attention.

Reedy Wastes (No. 18), W. Smedley Aston, was a landscape that reminded me somewhat of certain of Hinton's pictures. The manner of the treatment of the subject and the naming of the picture displays no real feeling for its artistic qualities, for, while the sky possessed some little charm, the distance was not well rendered, and the reeds in the foreground were peculiarly aggressive, but not sufficiently impressive to suggest the picture's title, the interest actually centering in the sky.

I found the frames of Nos. 295 and 297, W. Thomas, quite original. The former contained a clever photograph of a dog, and was called in the catalogue *Cats*; the latter, a salt sprinkled landscape, entitled *Winter*. No. 298 was a picture of a number of sheep. The catalogued title is

sturbed. Its effect on the observer was disturbing. It had all the appearance of a plain or hillside that has been hit underneath either by earthquake or the hammer of Thor, and set vibrating in a most remarkable manner. While I was observing the picture a gentleman alongside of me, who had been examining an adjoining picture, turned his eyes upon this one. Instantly he grasped the distance-bar in front of him, and exclaimed, in shaky tones, "Great heavens, look at that Dizzy-pe!"

Pictures (No. 296) *Autumn*, (299) *Woodland Graces*, (302) *In a Kentish Wood*, other examples of Mr. Thomas' work, were broad expanses of trees, fern, and frames. No. 301, *Sunset in the Pool*, was perhaps the most pleasing of all his pictures, because the least visible—thanks to its modest dimness—while No. 300, *A Summer Evening*, possessed certain merit because of the manner in which the water was indicated.

Mr. Harold Baker displayed ten pictures, Nos. 23-32. No. 26, *Missily Hanbury*, was chiefly remarkable for the jewellery worn by the subject. It was pretty jewellery. No. 31, *Stratford-on-Avon in February*, was simply a waste of space; No. 29, *Portrait in Costume*, was of a costume with a man in it; No. 25, *Grey Avon's Peace*, appeared somewhat better than No. 31, while No. 28, *A. Horsley Hinton, Esq.*, was an example of Mr. Horsley Hinton's great forbearance. I heard more than one person say, as they looked at this picture, that never again could they like Mr. Hinton's pictures as well as they did before having seen his portrait of him. No. 30, *The Countess of Warwick*, the picture of a very charming woman, was rather well posed, and rendered flesh and material values with a considerable degree of truth; No. 27, *Edward R. Taylor, Esq.*, was an example of the horrible possibilities of photography. The general impression created by *A Pleasant Story* (No. 24) was that the lady must have been indulging in very light literature from the way in which the book floats in air, supported at one end by the tip of a slender finger touched to the leaves, and at the other by a downy pillow; No. 23 was the portrait of a rather charming child, while No. 32, *Room in which Shakespeare was Born*, seemed somewhat untrue in line.

THE COMBINATION OF COLOURS.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

It is well known that the law of the combination of colour rays is applicable to the material admixture of colours, and the example which is often given, that ultramarine and vermillion yield a brown mixture, whilst blue and red light combined form violet, illustrates very clearly the difference between a mixture of pigments and a combination of rays of light. The effects of the admixture of pigments are frequently said to be irrational, but there cannot be any doubt of some connexion between both sets of phenomena, and it is not only of theoretical, but also of practical, importance to elucidate this.

The colour of a substance depends upon its capacity to absorb rays of definite wave-length, or to abstract them from the incident white light. The residual reflected rays unite according to the laws of colour combination, and cause a simple sensation, which we call the colour of the object. The nature and quantity of the absorbed rays are determined by the spectrum of absorption, and if we add up the elements of the band of absorption, with due regard to their intensity, according to the laws of colour combination, the colour thus obtained must be complementary to that of the substance.

If another pigment be added to the first, the second pigment absorbs part of the rays reflected by the first, and the mixed colour thus produced corresponds to the sum of the residual reflected rays. The same result may be obtained by taking the sum of the bands of absorption and subtracting it from white light, or, in other words, by finding the complementary to the absorption colour.

The colour obtained by the combination of various rays of coloured light corresponds to the sum of those rays, and the colour obtained by the admixture of pigments is determined by the sum of the rays which are absorbed. But, as the same laws apply to both cases, there appears to be no reason at present why the result obtained by adding up the sum of the rays should not also apply to the admixture of pigments. Red light combined with blue gives violet; a red pigment absorbs the green rays, and a blue pigment the yellow. A mixture of both would therefore absorb yellow-green, and the complementary to this is also violet.

It must be remembered, of course, that in combining rays of light the intensity is increased, and that, at the same time, more or less white light is produced, according to the colours which are combined. On the

other hand, in mixing pigments, degradation ensues, and a certain amount of black is formed.

Experience teaches us, in fact, that the admixture of pigments corresponds in tone to that of their colour rays, and instances are frequently cited as deviations from the law of the combination of colours, which should certainly not be so described. For example, there is a rather widespread opinion that blue and yellow pigments always form green whilst blue and yellow rays of light in combination produce a sensation of white. But this is only an apparent difference caused by want of precision in the definition of "blue" and "yellow." Pure blue and yellow, as shades of colour corresponding approximately with the colours of the spectrum, of wave-lengths 578 and 475, always form a colourless combination. These colours give white in combination, and pigments of the same tone, such as ultramarine and chrome yellow, form grey or black when mixed. On the other hand, a greenish-blue mixed with yellow forms green; but rays of light yield a whitish tone, whilst pigments, such as Paris blue and chrome yellow, yield a blackish tone.

But there is no doubt that all pigments do not conform to the laws of the combination of light rays, as shown by the instance given at the outset. Further consideration teaches us, however, that deviation from the rules of combination can only occur if the absorption bands of both colours partially overlap, because the increase of absorption at every part of the spectrum can only make itself apparent within certain limits, and any further intensification has no influence upon the colour. For instance, if certain rays are absent from the light reflected from a pigment, they cannot be absorbed by a second pigment, and their agreement with the law of combination will be disturbed.

Vermilion, for example, reflects only spectral red and orange from incident light, and, if it is mixed with pure blue, the yellow and the adjacent spectrum colours will be absorbed. The absorption which occurs in the yellow will no longer be operative, and the mixture will appear to be blackish-red, consequently brown; but, if double absorption become apparent in the yellow, it would produce the complementary colour, blue, and the mixture would appear violet.

If a red pigment be used, whose bands of absorption lie only in the green and blue-green, we find its mixture with a blue pigment will actually appear violet, as both bands of absorption do not clash.

The knowledge of this fact leads up to the general proposition: If the bands of absorption do not clash when two pigments are mixed, the resultant tone will agree with the law of colour combination. The form and extent of the bands of absorption are of no consequence, neither is the circumstance whether they comprise one or more divisions.

The shade of the mixed pigment will always be the same as that obtained from the combination of similar-coloured rays of light, and, by constant alteration of the quantity of a pigment, the colour of the mixture will also be altered.

If this condition be true, the law governing the combination of coloured

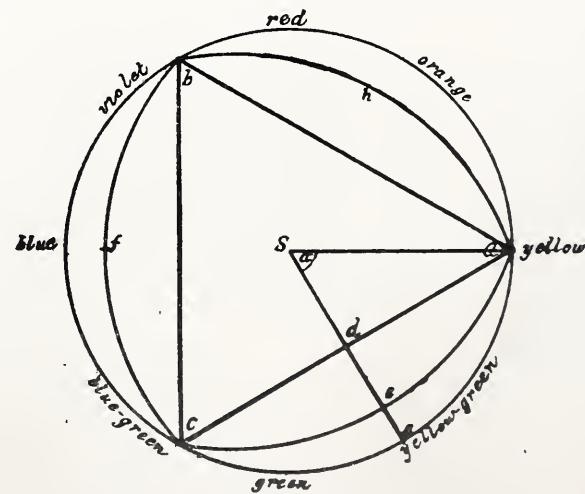


Fig. 1.

rays will also hold good for pigments: "Constituents of similar appearance will produce mixtures of similar appearance."

From these considerations the author has applied the geometrical representation of the law of combination of coloured light to pigments. Upon the circumference of a circle Hering's four primary colours are spread—red, yellow, green, and blue (fig. 1). These are supposed to

be of equal purity and intensity, and situate at 90° from each other. The centre of the circles, s , is black, and each radius represents the quantity of black mixed with each corresponding colour at the circumference.

For this colour chart to be of universal application, there should be no clashing of the bands of absorption when any two or more colours are combined, be they taken from the circumference or the surface of the disc. This condition will only be fulfilled if each pigment at the circumference give a single-absorption band in the form of a stripe, lying, of course, in that part of the spectrum representing the complementary colour.

Such pigments are found almost exclusively in the group of tar colours, but they must be used only in moderate intensity, as the band of absorption otherwise grows rapidly in breadth.

Only in the selection of the yellow-green and the pure green pigments do we encounter insurmountable difficulty, as there is not, even amongst the tar colours, any pigment of this colour with only a narrow band of absorption. This should lie in the purple, and rays of this colour are absolutely wanting in white light, because the eye is incapable of perceiving rays of light of this wave-length. The elements of white light, therefore, do not comprise the whole circle of our colour sensations, and this circumstance is the cause of deviations from the regular law in the case of certain mixed colours.

As the violet also is so slightly represented in the spectrum that it plays no part in the colour of pigments, we find that all green pigments show a double band of red and blue in the spectrum, instead of absorption in the purple. In consequence of this we find that moderate additions of yellow or blue pigments scarcely affect their appearance. The double absorption to which we have referred comes about in this way, and it has scarcely any influence upon the colour of the mixture.

But another consequence of the spectrum peculiarity of all green pigments is much more remarkable. It concerns the purity of their mixed colours, and, as these conditions have not been taken into consideration yet, they demand a more thorough investigation.

We have already mentioned that, in addition to the new shade of colour, a certain amount of black is also formed when pigments are mixed, and its quantity is equal to that of the white light formed when colour rays are combined under similar conditions. This conclusion is easily arrived at if we watch the course of both sets of phenomena. The greater the distance separating the colours upon the colour disc, the greater will their visual difference be, and the blacker their resultant tone. The quantity of black simultaneously formed may be taken from the colour chart. If pigments with broad bands of absorption are used, a larger quantity of black will be formed, and this is more especially the case if the new band of absorption affects complementary parts of the spectrum. Precisely the same thing is observed when we combine coloured rays of light. The colour of the combined light is whiter than that of simple rays, and the quantity of white is especially large when complementary colours are included in the combination.

On this account it is impossible to produce yellow by mixing green and orange pigments, since a substance must reflect spectral red and green in addition to yellow in order to appear yellow. The latter is, however, excluded from any mixture containing a green pigment, for the reasons we have stated. The band of absorption of the mixture is situate in the complementary colours, red and blue-green, and so much black is therefore produced that the yellow, which is formed, is scarcely perceptible.

The same phenomenon is also observed when green and blue pigments are mixed. Owing to the preponderating blackness of the mixture, the sensation of "blue-green" is almost destroyed in this case also.

Pure blue-green is a colour seldom met with. The splendour of the peacock's feather may be ascribed to it, and the peculiar delight we feel in looking at a clear mountain stream or a crevasse is in no small measure due to its peculiarity of colour. This blue-green can never be mistaken for a mixed blue-green, and is as far removed from it as a pure yellow is from a mixed yellowish-brown formed from orange and yellow-green.

Pure blue-green is only seen when the object reflects, in addition to these rays, all the blue and all the green, but this cannot be the case when a green pigment enters into the mixture.

The inability of the eye to see pure purple rays is due to the fact that there is no green pigment from which yellow and blue-green may be compounded, and the correctness of the colour chart ceases as soon as green enters into a mixed colour.

For all other parts of the coloured disc pigments may be found which will yield that quantity of black when they are mixed that the law of the colour chart expresses; but a peculiar phenomenon may be observed,

which appears to call in question the correctness of the geometrical representation.

For example, if we mix equal parts of the pigments at a and c , which are separated from each other by 120° , the result is blackish-green lying at d , which is also obtained by combining the pure colour, g , of the circumference with black. As the angle $a = 60^\circ$, the mixed colour, d , consists of 0·485 parts of pure green, g , and 0·515 parts of black.

This deduction from the theory is not, however, confirmed by experience, as it is possible to produce a very pure green by mixing blue-green and yellow. We thus meet with a contradiction between theory and experience, but this may be explained by the circumstance that the addition of black to a pure pigment does not have a visual effect proportional to the ratio of the admixture.

The effect may be observed by mixing white with black. If we add 10 to 20 per cent. of black, we scarcely perceive any marked degradation unless we compare it with some pure white object. Equal parts of white and black rotated upon a Newton's disc have the appearance of light grey, and the shade does not by any means appear to be midway between black and white. Not until we mix about twenty parts of white with eighty parts of black do we obtain a colour which may be called "medium" grey.

A white surface, covered with fine lines or a dotted network, gives an entirely different impression. Such a surface has a brightness determined by the relative quantities of white and black, and gives the impression of "medium" grey when the black lines occupy the same amount of space as the intervening white.

There is evidently a difference between objective brightness and subjective sensation. In looking at the ruled or dotted surface, a portion of the retina is deprived of its sensation of white by the black lines, and consequently the feeling corresponds to the quantity of white actually present, whilst the differences in brightness of homogeneous colour surfaces are not proportional to the white which may be present.

It will be remembered that Fechner has elucidated the interdependence of objective brightness and subjective sensation as a law. By comparing the tints of ruled surfaces with homogeneous mixed greys upon a rotated Newton's disc, the correctness of Fechner's law could be immediately confirmed.

For this purpose a scale of five different degrees of brightness was made by drawing upon paper black lines of various breadth, ranging from 0·05 mm. to 0·40 mm., and by measurement of their breadth and that of the intervening spaces the brightness of the screens could be determined. With the aid of two discs of white and black paper fixed upon a whirler, the tint of these lines was imitated. The angle of the white sector was measured, and the brightness of the homogeneous grey calculated from it.

The tones of the ruled screens were observed at such a distance that the lines were still perfectly distinguishable. The surface did not appear homogeneous, but, with a little practice and frequent repetition of the experiment, the comparison could be made without much difficulty. The objective brightness of the grey formed upon the rotating disc was determined by its components, and, by means of the ruled screen of corresponding brightness, the subjective sensation was ascertained.

The following table gives the mean values obtained from a number of experiments :—

Grey formed on the disc, composed of		Objective brightness of the surface of the disc.	Ruled screen of same brightness in proportional parts.		Objective and subjective brightness of the ruled surface.
White.	Black.		Wh te.	Black.	
35°	325°	0·10	10	20	0·33
60°	300°	0·17	14	14	0·50
90°	270°	0·25	18	10	0·64
135°	225°	0·37	22	6	0·78
230°	130°	0·64	30	2	0·94

As may be seen, the homogeneous grey always appears to be much brighter than it actually is, according to the amount of black in its composition.

These proportions are more clearly seen if the results of the experiments are expressed graphically. In fig. 2 the abscissæ are the objective brightness of the mixtures on the rotating disc, and the ordinates the corresponding subjective sensations. If the subjective and objective brightness were equal, the degree of their composition would be deter-

mined by oa , in which case the brightness, 0.5, of the rotating disc would correspond to a screen tone composed of equal parts of black and white.

The curve shown in the diagram has the appearance of a logarithmic line of the universal form :—

$$y = C_1 \log x + C_2,$$

and, by calculation, the coefficients, $C_1 = 0.79$ and $C_2 = 1.11$, were determined.

However, it appears that the value of these coefficients may be partly dependent upon the individuality of the observer, which might also be explained by the fact that a certain amount of consideration is necessary in comparing the surface of the screen with the homogeneous grey.

The subjective sensation of brightness therefore increases in logarithmic progression with the objective brightness, as required by

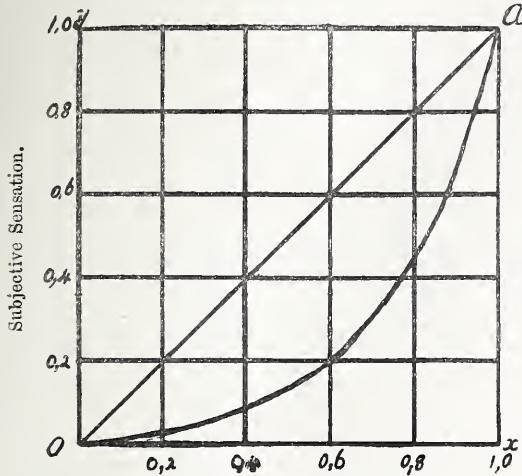


Fig. 2.—Objective Brightness.

Fechner's psycho-physical law. A grey composed of 3.5 parts of white and 7.5 parts of black, for instance, appears twice as bright as it should be, and we only see one-fourth of the black in a mixture composed of equal parts of black and white.

It may be inferred that, in mixing black with other pigments, similar phenomena occur, in which case it would be necessary to determine how far the law is influenced by the brightness of the colour.

In any case these conditions are of the highest importance in the mixture of pigments, as only a portion of the black entering into their composition is perceived, and they consequently seem purer than they are in fact.

Green obtained by mixing equal parts of Paris blue and chrome yellow contains, according to the law of colour composition, about 75 per cent. of black, a quantity which is justified, if we consider that both pigments are separated from each other by 150°. If our sensations followed the law of composition, only a greenish-grey would be obtained from the union of these pigments; but, since the addition of 75 per cent. of black only produces a subjective brightness of 0.64, the sensation of black is so much reduced that the mixed green appears to be sufficiently pure.

The conditions are more favourable still for two colours separated from each other upon the colour disc by 120°. The quantity of black contained by the intermediate mixed colour, as shown above, is 52 per cent., and it should really excite a sensation midway between that colour and black. But this is by no means the case, for a mixture of 52 per cent. of black excites a subjective brightness of nearly 0.9, and it therefore appears as though it were only degraded with 10 per cent. of black. We consequently obtain a green shade, which does not correspond in appearance with point d of the colour chart, but rather with e , which is much further removed from black.

If we determine similarly the subjective purity of all the colours situate upon the line of mixture, $a-c$, we obtain the curve, $a-e-c$, according to which they should be classified by their appearance.

From this examination of the behaviour of pigments when mixed, a number of important deductions of various kinds may be made for technical purposes.

Pigments which are to be mixed should not be selected by appearance only, but their spectroscopic peculiarities should be considered, and it is not permissible to modify their tone by indiscriminately adding other pigments.

Yellow and peacock-blue cannot be formed by mixture, as they should

consequently be regarded as primary colours, technically. If the largest possible number of mixed colours has to be produced from a small number of pigments, the primary colours should be selected at equal distances on the colour disc, as the purity of the mixed shades will then be secured equally in all directions.

The mixed colours appear to be much purer than they are by the law of their composition, and, but for this peculiarity of our sensations, the art of the painter and the process of chromo-lithography would be impossible.

For these reasons, three sufficiently pure pigments are enough to reproduce every shade of colour required in practice. They must be selected at distances at 120° upon the colour disc, and, as yellow and peacock-blue are at this distance from each other, it follows that purple is a primary colour. From these three pigments, situate at a , b , and c (fig. 1), not only all the colours enclosed by the triangle $a-b-c$, but also all the tones comprised within the curves, $e-f$, and h , may be obtained by mixture.

This fact is of the highest importance for three-colour printing by photography. It is well known that by this process three monochrome pictures may be made in the primary colours, which, by superposition, will combine and form a perfect colour picture.

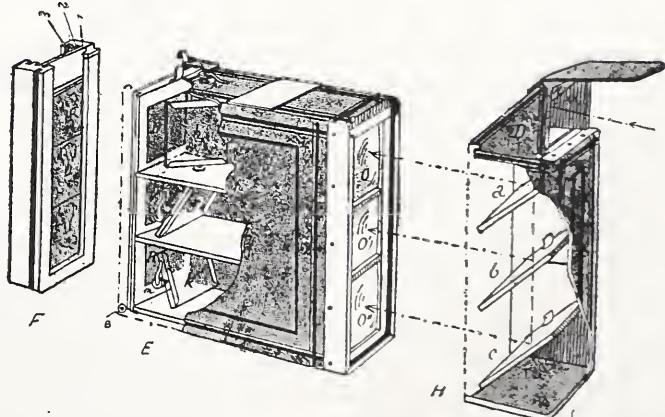
The three monochrome pictures are obtained by photography. The optical image is formed upon three photographic plates, each of which is only sensitive to a definite region of the spectrum, and from the negatives thus obtained the monochrome pictures are produced. The coloured rays reflected by the pigments are reduced to three by decomposition, and the colour sensation excited by each is represented by a pigment. It is evident that the process is only possible if the decomposition and combination of coloured rays of light are governed by the same laws as those of pigments. As pigments can be found, in the manner we have shown above, which behave in the same way as coloured light, a three-colour printing process, perfect in all respects, is a possibility.

BARON ARTHUR VON HÜBL.

THE MELANO-CHROMOSCOPE.

WE have already recorded the introduction of this instrument, which has been devised by M. Louis Ducois du Hauron for three-colour work. We extract the following description and illustrations from *Les Nouvelles Scientifiques et Photographiques*, which explains its construction.

The Melano-chromoscope is composed of three distinct parts: E , the body, which is a kind of camera, carrying the lenses, o , o' , o'' ; the glaces, which reverse the images, h , j , k ; and the frame carrying the colour filters, B (blue), V (green), and R (red), and it is divided into three compartments, as shown where partly in section. The front portion, H ,



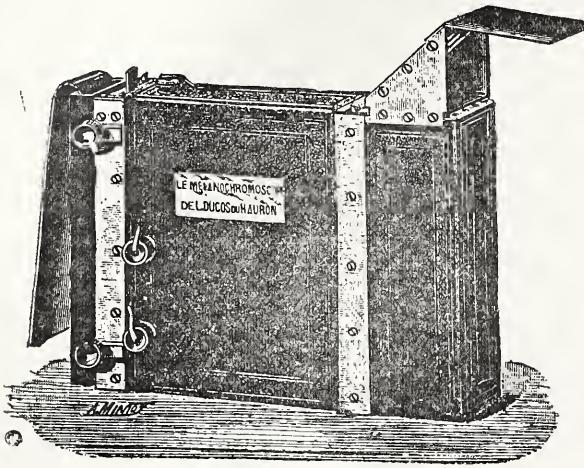
fits on to the camera, E , by means of grooves, and this carries two plain glasses, a , b , inclined at 45°, and a mirror, c , also inclined to the same angle; on top is the hood, d , surmounted by a sky shade, and furnished with a mirror, m , at an angle of 45°, which is used to reverse the images for the negative-taking.

The back portion, F , is a frame with three grooves, 1, 2, 3; the first is for the positive, the second for a grey glass to reduce the red image, the third for a ground glass to diffuse the light.

In order to take the negative, a panchromatic plate is placed in a dark slide at the back of the camera, against the colour screens. An actinometer is issued with the instrument to enable one to gauge the exposure, but with a yellow screen this is in sunlight about 120 seconds.

The rays proceeding from the object, after reflection from the mirror, M, in the hood, D, traverse a circular aperture, not shown in the diagram, and fall on the glass, A, and are thence partially reflected and traverse the objective, O, and form the blue negative, the remainder of the rays passing through this glass on to the second, B, and there undergo the same phenomenon, and the reflected part forms the green negative, and finally the remainder of the rays, after having traversed the two glasses, are entirely reflected by the mirror, C, through the objective, O", to form the red negative.

The plate is, of course, developed as usual, a positive made by contact



therefrom, and this is placed in the groove, 1, of the frame, F, which is attached to the body. The hood, D, is removed, and an eyepiece put in its place, which can be focussed on the frame, F. If the red image is too brilliant, a grey glass is placed behind it in the second groove. To ensure the absolute coincidence of the three images, the three glasses, H, J, K, which turn on their axes, are placed in the back of the body, E, and are actuated by the three screws outside, m, n, h.

The firm of M. L. Lesueur & Ducos du Hauron, of 22 Rue Rambuteau, Paris, are placing this on the market.

PHOSPHORESCENCE.

On Wednesday evening, the 3rd inst., Mr. Herbert Jackson delivered the first lecture of his course, addressed to a juvenile audience, at the Society of Arts, the subject being "The Phenomena of Phosphorescence."

The lecturer commenced by a reference to the natural sources of phosphorescence, as seen in the sea and in some cases of animal decay, &c. Phosphorescence and fluorescence might be treated as identical terms. They were illustrated by the exhibition of a phosphorescent jet of steam from a vessel containing water and phosphorus, and of the effect produced by sprinkling fluor spar on a heated plate. He then proceeded to show how there were certain substances which showed light, generally of a yellowish or greenish colour, when exposed to the more refrangible rays—the rays at the violet end of the spectrum—and showed how the visible spectrum was apparently extended in length when the violet and ultra-violet rays fell on a surface prepared with such materials as sulphate of quinine or thallene. On passing a slab of uranium glass along the spectrum, it was made manifest that no effect was produced on the glass by the red end, whereas, as soon as it was placed in the violet rays, it glowed with its characteristic greenish-yellow colour. The phosphorescence of quinine and of fluorescein, when the solution was dropped into a tall jar of water, was also shown, and further illustrated by burning sulphur in oxygen in a jar immersed within a larger jar filled with the phosphorescent solution. The phosphorescence of such materials only lasted while the exciting cause was present, but there were other materials which continued to emit light after the exciting light had been withdrawn. Of these, possibly the best known was Balmain's luminous paint. A card coated with this was exhibited, and it was shown how the brightness of the phosphorescence was temporarily increased by heat and diminished by cold. It was, however, possible to make other similar substances which acted in the same way, but showed light of different colours; and Mr. Jackson exhibited a fine series of phosphorescent bodies, principally lime salts, which, when excited by the brilliant discharge from a large induction coil, glowed for a certain time

with various tints, blue, yellowish-green, and pinkish-red. Phosphorescence could be produced in a block of lime, such as that used for the limelight, but it was of very short duration. If, however, such a block were rapidly rotated in the close neighbourhood of the induction-discharge, the phosphorescence produced by the discharge lasted long enough to be perceived on the side of the lime turned away from the spark as it rotated. After this the lecturer passed to the phosphorescent effects produced by the electrical discharge in vacuous tubes, and showed the very beautiful results in a long tube, in which a spark from an induction coil was passed, as the air and the various gases with which the tube was filled were gradually exhausted.

THE THREE-COLOUR PROCESS IN THE MAGAZINES.

The writer of the weekly notes on "Arts and Artists" in the *Daily Chronicle* is not favourably impressed with the three-colour process for purposes of artistic illustration. The colour prints, he says, is the fashion of the moment in illustration. This month, he adds, both the *Magazine of Art* and the *Studio* make a special feature of it. By way of showing its possibilities, the *Studio* reproduces first a pastel by Sisley, and then a water colour by Mr. Charles Robinson. The *Magazine of Art* experiments in a different direction, and gives a reproduction of a wood block in colour by Mr. Edward Detmold. The other illustrated monthlies are using colour more and more, even for the drawings printed in the text, which means an additional expense we are afraid the casual reader does not appreciate. Lately, the American magazines—the *Century*, *Harper's*, *Scribner's*—have been full of colour prints. The critic proceeds: "We believe in experimenting. Without experiment process or mechanical engraving, which was despised at the start, could never have been developed to its present perfection. But we think the colour print experiments have begun at the wrong end. Publishers and editors, as a rule, are trying to do too much, before even very little can be done well. As yet, the results of the three-colour processes are rarely successful, that is, from the artist's standpoint, wonderful as they may be scientifically. Colour is muddy, subtleties are lost, delicate tone vanishes. There are certain ways in which colour can be introduced satisfactorily. Take a chalk drawing on tinted paper, like Mr. Waterhouse's 'Study of a Head' in the *Studio*. The effect could not have been rendered so truly without the blue tint. This is excellent, in every respect better than the more ambitious attempts, but so simple, it is not called a colour print at all. The *Century* has been trying something of the kind by using a yellow tint, but with slightly more elaboration, the whites being cut out—a method that would answer very well for chalk or pencil drawings, heightened with white on tinted paper. It may be said that this is nothing new—it is only borrowing a hint, borrowed before, from the lithographer of thirty or forty years ago—and novelty is what is wanted. But there are still a few people left who want a thing to be good, whether it is new or old. When you come to colour carried a little or a great deal further, the trouble usually is that often the drawing or painting has not been made specially for reproduction, and it is as necessary to work for colour process as for ordinary process. This really is where the chief mistake is made. We do not mean to say that the artist should work down to the engraver and the printer. Not a bit of it. He should always keep a little in advance of them, so as to force them constantly to new effort and improvement; but he should know what they can do and what they cannot, and not ask them to accomplish the impossible, which is, after all, what happens when a pastel or a water colour, made without thought of reproduction, is handed over to the engraver. The colour print in illustration may have a great future before it, but we must confess that, up to the present, we should rather have a good reproduction of a good drawing, printed in good black ink on white paper, than all the colour the various processes have so far succeeded in giving.

NEW EXPERIMENTS WITH LIPPMANN'S PROCESS.*

WORKING with gelatine plates during this last summer was extraordinarily successful, and it proved that, if the approved formula† be followed, failure can hardly occur.

Our experiments were directed, in the first place, to simplify the preparation of the plates. The washing of the emulsion after the coating of the plates is by no means so simple when a large number (two dozen or

* Continued from p. 822 (1899).

† Dr. R. Neuhauß. *Die Farbenphotographie nach Lippmann's Verfahren*. Published by Wilhelm Knapp, Halle a/S., 1898. Price 3 marks.

more) of plates are to be prepared. The unwashed emulsion ripens very quickly. The coating of the plates must be done with the greatest speed, and there is always the danger that the plates first coated will be already dry on the marble slab, and that the films will be spoilt by the crystallising out of the excess of the salts before the whole of the plates have been coated. Moreover, especially in the cool of the year, the drying of the washed plates is accompanied by many inconveniences. Even when well whirled there will be formed on the washed plates, during drying, figures like the cells of the honey bee, by the remains of the liquids, which, by altering the sensitiveness of the gelatine film underneath, are unpleasantly noticeable on the developed plate. By using distilled water as the last washing water, and by the use of artificial heat in drying the plates, this fault can be partially, but not completely, obviated.

All this is avoided if the emulsion is washed, as in the preparation of very sensitive ordinary plates, before coating; but this method cannot be used with plates for Lippmann's process, as any ripening of the emulsion during a long washing has to be avoided. In his book, *Photographie in natürlichen Farben* (published by Wm. Knapp, Halle a/S., 1894), Valenta advises the precipitation of the emulsion by alcohol; that it should be broken up finely, washed, and again bringing it up to its original volume with water, and then, after the addition of the necessary dyes, coating the plate. Exclusive of the fact that this process is very costly in consequence of the large quantity of alcohol that must be used, we could never obtain satisfactory results with it. After several failures, another method gave us the best results: The mixed emulsion, with the dyes added, is made to set as quickly as possible by means of ice water, and is broken up by pressing through fine-meshed muslin. The breaking up must be much finer than with ordinary ripened emulsions, so that the washing may be done as quickly as possible. The broken-up emulsion should be placed in an emulsion filter, such as supplied by Braun (Berlin, Koniggrätzer-strasse, 31). The larger mouth of this filter should be covered with muslin and one layer of fine white mull. Washing is effected as follows: The flask is quickly plunged in a pail filled with water, so that the larger mouth of the filter is underneath. Whilst the air escapes from the small opening, the water penetrates through the larger opening of the materials, with some force, into the filter, and stirs up the broken-up emulsion. As soon as the filter is full, it should be quickly raised from the pail so that the water runs out, and, in order to avoid the blocking up of the pores of the stuff by the gelatine, the filter should be vigorously shaken.

This process should be repeated for fifteen minutes and the emulsion is completely washed with safety. A trial showed that even after five minutes washing scarcely any noticeable trace of the excess salts was present in the emulsion. Finally half a litre of distilled water is poured through the smaller opening of the filter, and it should then be allowed to drain for two hours at least, in order to remove as much as possible the excess of water which is sucked by the emulsion as by a sponge. The last traces of water are driven out by a gentle pressure of air obtained by an indiarubber ball. After melting at about 35° C. the emulsion is ready for coating.]

Obviously, by washing, a portion of the dye is removed, but this also occurs when washing the coated plates. It would obviously therefore be more convenient to add the dye after washing; we never obtained satisfactory results, however, with such experiments. It appears as though certain constituents of the dyes must be washed out.

An emulsion thus prepared will keep from two to three weeks in a cool room. The most satisfactory point is that the washed emulsion does not subsequently ripen in a cool temperature; unwashed emulsion ripens even in the cold, so that even after two or three days it is quite useless for Lippmann's process. Washed emulsion, by which the preparation of plates in large quantities is rendered much easier, can be heated to 45° C. without its usefulness suffering, only at 50° does it become cloudy by ripening.

In the *Bulletin de la Société Française* (1890, No. 4), Professor Lippmann published his present method of emulsion preparation, which shows certain variations from the usual methods. Lippmann uses for sensitising a surprisingly large quantity of dye, especially cyanine. Whilst according to Valenta's formula 1:2 c. c. of cyanine solution (1:500) should be used for 100 c. c. of emulsion, Lippmann takes 6 c. c. of cyanine solution to the same quantity of emulsion, besides 3 c. c. of an alcoholic solution of chinoline red (1:500) for the green sensitising. Now, it obviously depends upon the duration and the vigour of the subsequent washing how much dye remains in the emulsion. It should be specially noted, too, that Lippmann uses an alcohol bath before washing.

By testing the quantities of dyes prescribed by Lippmann we could not determine that there was any improvement in the rendering of the

red by the copious addition of the cyanine. On the other hand, we gained the impression that the red sensitiveness suffered because the screening action of the dye came into play. However, the various preparations of cyanine behave very differently and, this ought to explain the variations in the results.

With regard to the quantity of silver nitrate and potassium bromide, Lippmann's formula does not sensibly differ from other formulæ, one is confined here to narrow limits. The author has determined that even with double the usual quantity of silver bromide useless plates were obtained.

Very peculiar is the method by which Lippmann adds the silver nitrate to the bromised gelatine solution. Whilst, according to the earlier formulæ, the potassium bromide and silver nitrate were dissolved in separate portions of gelatine solution, and then, with constant stirring, the gelatine solution added drop by drop to the bromised gelatine, Lippmann shakes the finely powdered and dry silver nitrate into the bromised gelatine. The author has proved that both processes give exactly the same results. We now use, however, Lippmann's process entirely, as it simplifies the preparation of the emulsion. Only one pot of gelatine is now necessary, whilst previously two were required.

The correct colour reproduction depends essentially on the correct sensitising of the plates by suitable dyes. For red sensitiveness cyanine alone comes into consideration, although it would be highly desirable to replace this uncertain dye, that keeps so badly, by a better one. Obviously have also other dyes been recommended for red sensitising; still, they are far behind cyanine in their action. We made especial experiments with the continually vaunted nigrone B. (Beyer), and both with bathed and plates coloured with the emulsion; the red sensitiveness thus obtained was extremely poor. Its behaviour was least unfavourable when 6 c. c. of an alcoholic solution of nigrone (1:500) were added to 100 c. c. of emulsion. With increased addition of dye, the red action was still worse.

The author's trial of adding the cyanine by bathing the finished plates was not satisfactory. The solution recommended by Hübl (*Photo-Rundschau*, 1899, Heft 6, p. 170) was used as follows:—

Aqueous dextrine solution, ten per cent.	400 c. c.
Alcohol	150 ,,
Borax solution (cold saturated)	20 ,,
Cyanine solution (1:500)	3 ,,

The results were still worse when the gelatine plates, like the albumen plates, were bathed in 2 c. c. of cyanine solution to 400 c. c. of water. There remains therefore nothing to do for the red sensitiveness but to add the cyanine to the emulsion. We use 3 c. c. cyanine solution (1:500) to 100 c. c. of emulsion.

For green sensitising the author had previously used erythrosine. Still, this dye is very unsuitable, because it only sensitises for yellow-green, whilst blue-green is neglected. This is particularly noticeable in taking compound colours by the preponderance of the yellow green. Considerably better results are obtained by the use of chinoline red, as used by Lippmann. The most excellent results, however, were obtained by glycinrot, to be obtained from Kinzelberger, of Prague, and which has been lately recommended by Valenta.*

Valenta took 12 to 14 c. c. of a solution of glycinrot (1:500) to every 100 c. c. of emulsion. It is not here stated whether alcoholic or aqueous solutions were used. Previously alcoholic solutions have been used, but glycinrot will not dissolve in alcohol to a strength of 1:500, whilst its solubility in water is great.

The author instituted a long series of experiments with various additions of glycinrot, and always found excellent blue-green sensitising. With compound colours, however, yellow-green always remained deficient. Finally, a combination of cyanine, erythrosine, and glycinrot (this in saturated alcoholic solution), proved to be the best for the preparation of an actually panchromatic plate. To every 100 c. c. of emulsion was used—

Alcoholic cyanine solution (1:500)	3 c. c.
,, erythrosine solution (1:500)	2 ,,
,, glycinrot (saturated)	10 ,,

With emulsions thus coloured, under normal light conditions, with spectra and compound colours, the different colours from red to violet are rendered absolutely equal.

Whether this combination of dyes would give equally satisfactory results, as regards panchromatism, with highly sensitive emulsion, we have not yet worked out. Naturally must the quantity of dyes be altered,

* *Photo. Corresp.*, 1899 Heft. 9, p. 550.

since with Lippmann's emulsions, on account of the subsequent washing, large quantities of dye have to be taken.

The large addition of alcohol (15 c. c. to 100 c. c. emulsion) appears doubtful. Experience teaches, however, that it is not only harmless, but, on the contrary, is very advantageous, since in this way extremely fine-grained and clear emulsions are obtained. A striking phenomenon is observed in the preparation of the emulsion: if the cold alcoholic dye solutions are poured into the warm emulsion, there will be an increase in temperature of at least 1.5° C. If, therefore, in the preparation of the emulsion the temperature of 40° C is not to be overstepped, the temperature of the emulsion before the addition of the dye solutions should not be more than 38° C.

(To be continued.)

DIRECT POSITIVES IN THE CAMERA.

MESSRS. J. E. Thornton and C. F. S. Rothwell have patented a process to enable positive pictures to be produced direct, by developing, fixing, whitening, and washing the colloid sensitised surface that has been exposed in the camera, thus dispensing with all subsequent processes, such as printing, toning, and washing of a positive prepared from a negative.

They add: "A positive picture thus obtained may at once be mounted in a frame, or on a card or other suitable mount. The process will be of great convenience to tourists, travellers, and others, as they may see the finished picture before leaving the scene of operations.

Owing to the fact that such a positive image is required only on the surface of the film, and very much weaker for viewing by transmitted light than a negative image, which is required or used for printing, a much shorter exposure is necessary to produce a perfect picture; in fact, an exposure of half the duration necessary for the usual processes has been found sufficient by us. This reducing or shortening of the exposure is of great advantage to photographers, as it often occurs that sufficient exposure cannot be obtained under some conditions of light and subject to produce negatives with the existing rapidity of lenses and speed of gelatino-bromide emulsions. It therefore follows that a process by which results are obtained with half the exposure hitherto required will often, under adverse conditions, render good results where otherwise no results of value would have been obtainable.

"This invention consists essentially in a photographic receiving film, or plate, comprising a transparent gelatino-bromide emulsion coated on an opaque flexible backing, such as black paper, celluloid, or other similar material, which, when exposed in the camera, is developed and fixed, and afterwards treated with a whitening solution. The black or coloured base forms by its colour the dark portions of the picture, the shades and light portions being formed by the varying layers of white-coloured deposit which form the image. The sensitive coating we find may be very thin, much thinner than is usual in the ordinary process, as by our process the images do not require to be of such an intense nature when developed, as they are further reinforced during the process of whitening the image. For the same reason a shorter exposure may be given in the camera.

"In the preparation of the flexible sensitised film, or plate, it is possible to vary the process of manufacture, according to the exact requirements of the user, without departing from the principle of the invention.

"In its simplest form it is sufficient to coat the sensitive gelatino-bromide emulsion directly upon the black or coloured paper. In other cases we may use a white or non-opaque paper, and coat it with a suitably coloured substratum before applying the sensitive gelatino-bromide emulsion. Such a suitable substratum is celluloid, gelatine, or other like substance, with which is incorporated a pigment of suitable colour. An advantage of this latter method is that any suitable kind of surface may be given to the paper as a support for the sensitised emulsion.

"The surface of the flexible or paper backing may be so hard that the image, when developed, will not partially 'sink' into the pores of the paper; the surface may be very glossy, bright, and smooth, giving the picture similar characteristics; or it may have a grain which will give the picture a matt or dead appearance. It is often desirable to calender the prepared backing before coating with emulsion.

"In any case it is important that the sensitive coating shall be on the surface of the black or coloured-paper backing only, and shall not be allowed to penetrate into the pores or substance of the film base in order to prevent the image upon the exceedingly thin and fine sensitive coating from sinking as aforesaid, which would otherwise not only give the picture a rough surface, but also a dirty and indistinct appearance, with insufficient contrasts between the high lights and deepest shadows. Therefore, the black or coloured-paper backing must either be sufficiently waterproof and hard on the surface, or otherwise be rendered so with suitable resinous or other varnish, before applying the sensitive emulsion. For this reason we prefer always to apply such a varnish unless we use an opaque

backing such as black or coloured celluloid or other flexible material that already possesses a sufficiently hard or non-absorbent surface.

"A suitable positive film may be built up as follows:—

- A. Black or coloured paper backing or base.
Sensitised gelatino-bromide layer.
- B. Paper backing or base.
Black or coloured waterproof layer.
Sensitised gelatino-bromide layer.

"Films made according to this invention are conveniently supplied in lengths, wound on spools for roll-holders and cameras, and, by reason of their opaque backing, can be loaded into such exposure apparatus in daylight without a dark room.

"They may also be made in sheets for use in dark slides, magazines, and similar apparatus.

"In use, the photographer who produces the picture places the sensitised positive film in the camera for exposure, and, after an exposure of very short duration, the picture is developed by means of any of the ordinary photographic developers, preference being given to those which have little or no staining action upon the film, as, for example, hydroquinone, glycine, or metol. After developing the picture until all the image is clearly seen and of sufficient density or strength, it is fixed (that is to say, the unused silver salts are removed) by placing the picture in a solution of hyposulphite of soda of a suitable strength. We find in practice a ten to twenty per cent. solution acts well, but it may be stronger or weaker than this. Any other suitable fixer, such as cyanide of potassium, for instance, may be used. The fixing solution is afterwards removed from the film by washing in the usual way.

"The film carrying the picture (which is now only just visible) is immersed in a solution composed of mercuric bichloride, with or without the addition of ammonium chloride, salt, hydrochloric acid, sulphuric acid, or potassium bromide until the picture is whitened sufficiently. We thus obtain a picture composed of a light deposit, on a ground varying in colour according to the colour of the film base used.

"Instead of using mercuric bichloride we may attain the same end by the use of bromide of copper, cupric chloride, ferric chloride, or any other chemical which, when acting upon the silver image, converts it into a white or light-coloured condition. After whitening, the picture is finally washed and then dried, which latter operation may be assisted by heat if quick drying is required."

Messrs. Thornton & Rothwell conclude: "We are aware that positive pictures have been made direct in the camera by a sensitised collodion on metal previously prepared with a black varnish, but in the present state of knowledge of the photographic art such a film is too slow for the requirements of modern instantaneous photography, and cannot be rolled up on spools, and it is only by combining a gelatino-bromide emulsion with a black or coloured backing, and by whitening the image after development, that the necessary requirements of a good, cheap, and instantaneous positive film, which may be wound on rolls or used in flat cut pieces are fulfilled. This is what our invention renders possible and actually accomplishes, and as such it constitutes a new step or advance in the art of photography."

NOTES FROM THE WEST OF SCOTLAND.

CHRISTMAS and New-year weeks among photographers in the West of Scotland have always been looked forward to with eagerness by reason of the annual Exhibition of work by members of the Glasgow and West of Scotland Amateur Association, at which all important work executed during the previous year was generally displayed. This year, however, the Council has made a fresh departure in their annual fixture. Instead of having the Exhibition during the holiday weeks, they have decided upon postponing the Exhibition until the first week in February, a change which is expected to work in several ways more satisfactorily, especially in regard to there being a larger attendance of members and the public, many of whom, from private reasons, are called away during the Christmas holidays.

At the forthcoming Exhibition, which opens on February 2 next, the judging will be effected by the vote of the members of the Association.

A movement has been set on foot to form an optical association in Glasgow, the object being to bring the various opticians more in touch with each other, and to discuss matters more particularly of interest to the optical trade. The movement emanated, we understand, with Mr. Sam Fulton, of Messrs. Gardner & Co., and the idea is well entertained by several of our leading opticians; among others, Mr. Matthew Ballantyne, of Messrs. Lizars', strongly favouring the scheme.

There has been, so far as the season has gone, an enormous run on the cinematograph, and those firms who saw fit to cater more especially for this class of entertainment have far more orders placed before them than they can execute. No doubt, the fact that several firms who had previously catered for such with the public, but who gave the business-up last season, has had much to do with the rush that has been thrown upon the few who continue to make a specialty of the cinematograph.

Our Editorial Table.

SHARLAND'S *New Zealand Photographer*, which is published at Auckland, New Zealand, and 43, London Wall, London, E.C., begins a new series with the January issue, a copy of which is now before us. It contains many articles on practical photographic subjects, illustrations, &c. The section "Current market quotations, in New Zealand, for photographic requisites, should be found useful for reference. Quarter-plates are 1s. 3d. and 1s. 4d. per doz.; silver nitrate, 3s. 6d. per oz.; hypo, 4 lbs. for 1s.; metol, 4s. per oz.; and so forth. We welcome our *New Zealand Photographer*, and wish it a long and prosperous career.

MR. S. H. FRY, of 12, South Villas, Camden-square, N.W., sends us his Almanack and Date Card for 1900. It is a pretty as well as a useful office adjunct, for it is embellished with a capital carbon print from a negative by Messrs. Byrne & Co., of Richmond, Surrey.

FROM MESSRS. EDE & ALLOM, the well-known printers, we have also received a number of Date Cards for 1900. These are tasteful and effective in design, and, like all the firm's work, beautifully turned out.

ONE of the Christmas cards that we have not yet acknowledged, and that demands both special and separate recognition, was sent us by Messrs. Mayall & Newman, Limited, photographers, of 91, King's-road, Brighton. It is a beautifully framed portrait of an individual, who need not be particularly indicated here. Let it, however, be said that those most qualified to pass an opinion pronounce the likeness a remarkably faithful one, and declare the facial expression of the sitter to be happy and characteristic. In thanking Messrs. Mayall & Newman for the portrait, which is a very fine specimen of artistic photography, we may say that the interest which others, besides ourselves, take in the original will ensure it the best possible reception—namely, permanent preservation.

THE LANCET PRINT-TRIMMERS.

Manufactured by R. & J. Beck, 68, Cornhill, E.C.

FOR sevenpence Messrs. Beck supply the photographer with a holder and a box of twelve "trimmers," resembling miniature blades, which can be used for the purposes of trimming and cutting prints. We have put the little trimmers to practical use, and perceive that the photographer should find them of great service.

By the courtesy of the Editors of our esteemed contemporary, the *Photogram*, we have been made the recipients of the bound volume of that admirable publication for 1899. With its wealth of beautiful illustrations and well-chosen articles it makes a superb gift-book for a photographer.

News and Notes.

THE headquarters of the Bootle Photographic Society are at 163, Strand-road, Bootle, and not at the address given in our ALMANAC just published.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, January 16, at 66, Russell-square, W.C., at eight p.m. "Screen Gears for Half-tone," by W. Gamble.

PHOTOGRAPHIC CLUB.—Wednesday evening, January 17, at eight o'clock, "Lantern-slide Making without a Dark Room on Kristal Plates, and a Series of Views of Venice," by B. J. Edwards & Co.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—At the meeting on Thursday, January 18, Mr. E. Hunt will demonstrate "Photogravure." Visitors will be cordially welcomed at the White Swan, Tudor-street, E.C.

WE are sorry to learn of the death, on the 2nd instant, of Mr. W. F. Mills, at the age of seventy-nine. Deceased passed away at his residence, Markham-square, and was cremated at Woking on Friday. Mr. Mills will be remembered as the head of the business of Messrs. Newman, artists and photographers' colourmen, Soho-square.

THE Fifth Annual Bohemian Concert of the employés of Mr. J. Fallowfield will be held on Friday evening, February 16 next, at the Champion Hotel, Aldersgate-street, E.C. Mr. F. W. Hindley will preside. The Hon. Secretaryship is again in the capable hands of Mr. F. J. Goode, and an enjoyable evening may therefore be anticipated.

THE HUDDERSFIELD EXHIBITION.—Mr. A. G. Lockett, the Curator of the Art Gallery, Huddersfield, writes that he has had a communication from Mr. Reginald Craigie, Secretary to the "Linked Ring," to the effect that, contrary to anticipation, very few of the "Ring" exhibits (in the second room of the Art Gallery) will be required for the Paris Exhibition, as the exhibitors are sending duplicates for exhibition there. This means that the present exhibition in the Art Gallery will remain open almost in its entirety until the end of this month. There have been up to the present twenty-three pictures sold, exclusive of two extra copies of one, and one of another.

THE *University Correspondent* has published its annual crop of amusing mistakes made by schoolboys in answers to examination questions. The following answers, selected from many similar ones, show how easy it is for pupils to receive inaccurate and confused impressions when given didactic instruction, and also how essential it is that examination questions should be explicit: "When would you expect an eclipse of the sun to take place?" "In the night." "The sun never sets on English possessions, because the sun sets in the west, and our colonies are in the north, south, and east." "The experts of Ceylon are peculiar to any other part of the world. The chief are piano steamers (sc. P. and O. steamer)." "A cubic foot of water weighs 64 lbs. ∴ a square foot of water weighs 16 lb., and a foot of water weighs 4 lb." "The three principal parts of the eye are the pupil, the moist, and the beam." "A mariner's compass is a little post stuck up in the sea, and, when people want to know the way, the ships go and look at it."

PHOTOGRAPHY FOR ARCHITECTS.—To the professional and practising architect photography is, if anything, of even more value than to the student, for by it he has the power of recording, at all stages, the progress of his works in course of construction, and their final effect when completed and ready to leave his hands. Most architects who have been in practice for any length of time would probably value a complete collection of photographs of their works very much indeed, and such a collection, especially if accompanied by reduced photographs of the plans, would also be very useful for showing to clients, who rarely understand geometrical drawings by themselves, and seldom gather from them a correct idea of the buildings they represent. It is also often of great convenience to be able to produce quickly and in quantity reduced copies of plans, elevations, and perspectives for purposes of publication or transmission to a distance, and this also can be done by the architect, who is his own photographer, without the drawings leaving the office, and without the errors which too often occur when any chance professional not familiar with this kind of work is called in. When rebuilding has to be done, photography is often also of use, not only for preserving a record of the original edifice and its surroundings, but also for providing evidence on legal points which may arise on such matters as ancient lights, damage to adjacent property, &c. Cracks in walls may, for instance, be carefully photographed from time to time for the purpose of seeing if they extend or widen in consequence of any alterations in progress; subsidences may be detected and recorded, and other data of much value be obtained by the use of the camera.—"D. B." in the *Builder*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
15.....	Bradford Photo. Society	Annual Meeting. Further Discoveries with the X Rays.
15.....	Camera Club	William Webster, F.C.S.
15.....	Glasgow and West of Scotland .	Demonstration: Photo-micrography and the Projection Microscope. Thomas W. Robertson.
15.....	South London	Paper by W. F. Slater, F.R.P.S.
15.....	Stafford Photo. Society.....	The Pictorial Treatment of Lantern Slides. Reader, H. Cliff.
16.....	Gospel Oak	Demonstration: Aura Paper. H. Morgan.
16.....	Hackney	Paper by J. H. Gear.
16.....	Isle of Thanet	Technical Control for Pictorial Results. W. Thomas.
16.....	Redhill and District	Annual General Meeting.
16.....	Royal Photographic Society	Screen Gears for Half-tone. W. Gamble.
17.....	Borough Polytechnic	Some Methods of Control in Photographic Printing. G. J. T. Walford.
17.....	Croydon Camera Club	Forty-ninth Public Lantern Show.—A Week in Belgium. Walter D. Welford.
17.....	Photographic Club	Lantern-slide Making without a Dark Room on Kristal Plates, and a Series of Views of Venice. B. J. Edwards & Co.
17.....	Southsea	Royal Photographic Society Lecture: Photography by Artificial Light.
17.....	Tunbridge Wells	Wet-plate Process. A. W. Pierson.—Annual Meeting.
17.....	Woodford	Long-focus Photography. E. Marriage, F.R.P.S.
18.....	Camera Club	Developers, Old and New. C. H. Bothamley, F.C.S., F.I.C.
18.....	Darwen	Lecture: Portraiture.
18.....	Glasgow and West of Scotland .	Demonstration: Gravura Paper. A. C. Baldwin.
18.....	Liverpool Amateur	Annual Meeting.
18.....	London and Provincial	Photogravure. E. Hunt.
18.....	Oldham	Lantern-slide Making. T. Burton.
19.....	Borough Polytechnic	Practical Evening: Halation, and Colour Values.
19.....	Croydon Microscopical	Conversational Meeting.
19.....	West London	Beginners' Meeting: Negatives and their Treatment. H. Selby.
19.....	Whitby	Lantern Slides: A Tour in Yorkshire.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 9.—Ordinary Meeting,—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

NEW MEMBERS, &c.

Ten new members were elected, and three candidates for membership were nominated.

The CHAIRMAN announced that the following members had been admitted as

Fellows, viz., G. T. Harris, J. E. Hodd, Professor Smiley, W. T. Greatbatch, W. B. Ferguson, Q.C., and B. L. Warren; also that the Dudley Camera Club had been admitted to affiliation.

SCRUTINEERS.

The following members were appointed to act as scrutineers at the forthcoming election of Council and officers, viz., Messrs. R. Beckett, J. H. Agar-Baugh, H. W. Bennett, Drinkwater Butt, E. Clifton, E. Crofton, T. Sebastian Davis, J. R. Gotz, H. C. Rapson, and E. Sanger Shepherd.

COPPER TONING.

Mr. W. B. FERGUSON, M.A., Q.C., read a paper entitled "Toning and Intensification with Copper Salts." Having occasion, in 1895, to look over a number of lantern slides which had been toned with uranium, or intensified, after bleaching, with mercuric chloride, he found that many of them had undergone such remarkable and unlooked-for changes, that they were more like specimens of Mr. Bennet's colour process than anything else. These colour effects, however, did not altogether meet with his approval, and, in subsequently attempting to find some more satisfactory method of toning lantern slides, he turned his attention more particularly to the salts of copper, and his paper consisted of a detailed account of his experiments—begun in 1895, and continued until quite recently—with a view of finding the best process of toning lantern slides and bromide prints with copper salts. The materials utilised were ferricyanide of potassium and cupric sulphate, the latter salt being chosen, not only because it was cheap and easily obtainable, but also because it was a stable salt without oxidising or reducing action on the other reagents employed. After recounting his experiences with an ammoniacal solution of copper ferricyanide in combination with ammonium carbonate, carbonate of potash, and nitrate of ammonium, all of which produced stains which could not be readily removed, he tried oxalate of potash, which, with the cupric ferricyanide, formed a solution in which plates and papers were toned with considerable success, as was shown by some excellent prints made in 1897. This process, however, possessed certain disadvantages. The toning solution rapidly deteriorated, and had to be used as soon as mixed; its successful use necessitated the removal from the print or plate of every trace of hypo; unless the water was pure and free from lime, the high lights were slightly stained, and prolonged treatment was required in order to secure a red tone. The author therefore sought a more suitable solvent for the ferricyanide, and, after trying phosphate of soda, acetate of soda, tartaric acid, and ammonium citrate, he found in potassic citrate a substance which apparently met all the requirements of the case. The method recommended was to make ten per cent. solution of neutral potassic citrate, sulphate of copper, and ferricyanide of potassium, a mixture of which, in the following proportions, was shown to yield, either on plates or paper, a series of beautiful tones, without stain, varying from purple-black to cherry red, according to the time of immersion:—

Neutral citrate of potash (ten per cent. solution)	250 c. c.
Sulphate of copper	35 "
Ferricyanide of potassium	30 "
Mix in the order named.	

A number of bromide prints and lantern slides which had been toned by this process were shown, and demonstrated the many beautiful shades of colour which might be obtained by stopping the operation at different stages.

Mr. FERGUSON prepared a toning bath, and toned some prints and transparencies, the method appearing to be simple, certain, and expeditious.

Mr. J. SPILLER congratulated Mr. Ferguson upon the undoubted success which had followed his experiments, and recalled the fact that his (Mr. Spiller's) first paper, read before the Chemical Society in 1857, dealt with the remarkable solvent powers of neutral citrates.

Mr. E. MARRIAGE showed some lantern slides treated by various methods as follows: Partially toned in ten per cent. solution of copper chloride; bleached in a ten per cent. solution of copper chloride and then sunned; bleached in a weak solution of perchloride of iron and hydrochloric acid, and also in a solution of bichromate of potash and hydrochloric acid; Schlippe's salt after copper chloride; ammonium sulphide, followed by copper chloride; bleached with chloride of nickel, and then sunned or treated with Schlippe's salt; and several other methods with ferricyanide, followed by cobalt, nickel, and manganese, and Mr. Ferguson's formulae.

Mr. BOLAS, Mr. SNOWDEN WARD, and the CHAIRMAN also took part in the brief discussion.

COMING EVENTS.

January 16, Photo-mechanical Meeting, "Screen Gears for Half-tone Work," by Mr. W. Gamble.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 4.—Mr. A. Mackie in the chair.

Mr. J. E. HODD made some observations respecting the use of the Welsbach light for projecting purposes. The new No. 2 Welsbach burner required no chimney, which was, of course, a great advantage. He used the light for enlarging with a six-inch condenser, and found that the same light could be used for projection, a six-foot disc admirably illuminated being obtained. It was his custom to employ Novitas paper in preparing the transparency for enlarging negatives, and thought it altogether superior to the plate. One may correct anything wrong, and dodge so much better upon a printed-out image. He never toned the Novitas prints intended for use as transparencies. The dirty yellow tone which appeared after fixing a chloride image suited well. There seemed to be better gradation and half-tone detail. Of course, the print would have to be bronzed right through for transparency purposes.

The CHAIRMAN pointed out that it would, of course, be necessary to suit the negative to the scale of gradation given by Novitas, as one would with other printing-out papers. Platinotype was similar in this respect. A still better scale would be given by transmitted light with such papers than by reflected light.

Mr. J. S. TEARE, referring to this question of scale in a negative, said that

he had through his hands some time ago a negative in which two figures dressed respectively in black and white gave such harshness that the negative, as it was, would be valueless. He made a very good negative, however, by printing upon Novitas stripping film paper, stripping the positive, and affixing to the glass side of the negative, and scraping away the parts not required in reducing the contrasts. This course was suggested some time ago by Mr. A. Haddon, who superimposed a positive Novitas paper image upon the negative, so compensating some unnecessary details which appeared in the photograph as originally taken, the detail required, of course, being left as before.

The subject of backing for plates, and whether backing did slow the speed, as asserted by Mr. Thomas Fall and others, was discussed at some length.

Mr. J. S. TEAPE thought that plates nowadays did not require backing so much as they did three or four years ago.

The discussion eventually arrived at that point at which the suggestion was made that backing should really increase the speed of a plate, and it was decided to invite Mr. Fall to favour the Association by attending some night and giving his experiences in the matter.

Messrs. J. E. Freshwater, E. T. Wright, and W. D. Welford were appointed a Committee to arrange for the Annual Supper.

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Borough Polytechnic Photographic Society.—Mr. R. R. RAWKINS opened the New-year's programme of this Society on the 3rd inst., with a popular lantern lecture descriptive of farm life in Dorset. The success achieved by Mr. Rawkins as a lantern-slide maker is well known, and every one of the 120 slides shown by him were typical examples of perfect technique, combined with high artistic feeling. A pleasant break in the lecture was made the occasion of an interesting presentation by the Chairman of the Society, Mr. F. W. Bannister, of the medals gained in the Society's fifth annual Exhibition, which closed on the preceding Saturday. In addition to the Exhibition awards, the medals and certificates gained in members' competitions during the past year were also distributed.

Croydon Camera Club.—January 3, Mr. Hector Maclean in the chair.

HELPING FAULTY NEGATIVES.

The perfect negative can hardly be said to exist, the imperfect one being everywhere the rule. All that can be claimed is that some negatives are a good deal worse than others. Mr. F. T. BEESON, F.R.P.S., held the attention of a capital attendance of the members for an hour and a half while he in much detail, and with the evident knowledge of one who only preaches what he has practised, explained the various expedients useful for "the preparation of negative for printing." As the PRESIDENT reminded the meeting, although help is mostly called for, it is seldom rendered to the negative by the ordinary amateur, in spite of the fact that most of the medal winners, especially professional, spend much care and taste in "preparing" a negative for printing. Mr. Benson stated that it was generally impossible by purely photographic means to obtain a critically correct rendering of tones, especially when engaged in outdoor work under widely varying conditions of lighting. As Payne Jennings once said to the lecturer, "You've got a great deal to learn if you think that negatives are fit to print directly they are dry." Having carefully explained several chemical means of improving defects in negatives, Mr. Beeson went on to speak of mechanical means, in the course of which he clearly described a number of useful ways of masking (*i.e.*, stopping back of light on the glass). Amongst pigments, &c., not often heard of, the use of a mixture of putty and chrome was described. But chief reliance was placed by Mr. Beeson upon a combination of gamboge, Prussian blue, flake white, turpentine, and Megilph or siccative applied with a brush. How this was done was demonstrated with considerable detail. Other expedients having been spoken of, a considerable amount of attention was given to the best way of working on the film side to eradicate the spots and markings which negatives are at times prone to, in the course of which Mr. Beeson, by means of a blackboard, showed members how the spotting brush and the retouching pencil should be employed for the above purposes.

Rotherham Photographic Society.—January 2, Mr. E. Isle Hubbard, M.S.A., presided.—The preliminary business included the adoption of a petition against the Copyright Bill, which will come before the next session of Parliament. It was decided to continue in affiliation with the Royal Photographic Society, and the President, Dr. Baldwin, and the Hon. Secretary, Mr. H. C. Hemmingway, were re-elected delegates. Mr. Harold Baker's lecture on portrait photography was read, the accompanying illustrations in the form of slides being projected on the screen, and much appreciated by the members. Mr. Darling, who is on the staff of a London technical institute, subsequently gave a demonstration of inkless printing, the invention of a photographer, Mr. Friese-Greene. The process may be described as an electro-chemical one. Mr. Darling superimposed paper chemically treated on a metal plate in connexion with one of the poles of a powerful battery. The other wire of the battery was attached to the type, and the moment it touched the paper the electric circuit was completed and there resulted a printed impression.

FORTHCOMING EXHIBITIONS.

1900.

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| January | Huddersfield (Invitation). W. A. Beevers. Cloth Hall-street, Huddersfield. |
| " 29-31..... | Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea. |
| February 10-24 | Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh. |
| " 24-March 3 | Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley. |

- March South London Photographic Society.
 „ 26 Twentieth Century International, Birmingham.
 Walter D. Welford, 19, Southampton-buildings,
 Chancery-lane, London, W.C.
 „ 26-31 Photographic Society of Ireland. W. F. Cooper,
 35, Dawson-street, Dublin.
 April 3-7 Birkenhead International. C. F. Inston, 25, South
 John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

The following applications for Patents were made between December 27 and December 30, 1899:

- SHUTTERS.—No. 25,549. "Improvements in Photographic Shutters and Cameras." J. E. THORNTON.
 PRINTING FRAMES.—No. 25,657. "Improvements in Photographic Printing Frames." Complete specification. W. HUDSON and L. HUDSON.
 CHANGING APPARATUS.—No. 25,696. "Improvements in Film-changing Apparatus for Photographic Cameras." E. FIELD.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** We do not undertake responsibility for the opinions expressed by our correspondents.*

DR. VON ROHR'S THEORY AND HISTORY OF LENSES.

To the Editors.

GENTLEMEN,—I was really much puzzled on reading Mr. W. Curry's letter.

Every reader is, of course, free to approve or disapprove of any author's opinions, and I am not silly enough to think mine an exception to this fate common to all authors. I only protested and protest against the reproach of having written anything inconsistent with the sources given.

When, finally, Mr. W. Curry finds fault with me for my mentioning Mr. J. H. Dallmeyer's kindness in my answer of December 18, 1899, I submit to all readers, if it was not Mr. W. Curry himself who first introduced this personal quality of Mr. J. H. Dallmeyer's. I am glad, however, that in this case, at any rate, Mr. W. Curry and myself agree that this point mentioned by him in his first letter has nothing whatever to do with my theory and history of lenses.—I am, yours, &c.,

Jena, January 6, 1900.

DR. VON ROHR.

[Both sides having been fully heard we here terminate this correspondence.—EDS.]

MATT PRINTING.

To the Editors.

GENTLEMEN,—In your issue of December 15, you copy one of my contributions on silver printing, giving it the heading of "Permanent Albumen Prints." I hope you will pardon me if I correct what to my mind is misleading. Any one reading the article carefully will see that it is intended for a simple, permanent matt-paper print; hence the immersion of the paper in the solution instead of floating it. This does not, however, prevent its being used on the glossy side, the print, however, not being so much on the surface as when the paper is merely floated. It has, however, other advantages, such as retaining more detail in the delicate half-tones than floated paper, and also being almost free from any danger of blisters, as the albumen by immersion is coagulated equally as much on the back as on the surface. The results for matt printing on the back of the paper are superior to those obtained on the usual plain salted papers, as well as for working with water colours. It is not new, the idea being the result of necessity caused by close ideas of economy.

In 1863, when a mere boy, I was employed as assistant printer by a thrifty German photographer of this city, and my sole means of silvering albumen paper (then only single albumenised) was a dish 10×12 inches. As two and sometimes three dozen sheets per day were consumed, the silvering was very tedious, and I asked for a dish to hold a whole sheet. This was thought preposterous, as such sizes were rare, and nitrate of silver was then \$2·40 per ounce in our paper currency. So, after addling my brains over night, it occurred to me to try, surreptitiously, immersion,

first of one sheet, then of three or four, and finally of entire batches, until I found that no difference was noted, and I then gave my employer the tip. He thought it a huge joke, and would poke any amount of fun at my constantly blackened fingers, as a result of immersing eight or ten sheets at a time instead of the cleanlier method of floating. It never occurred to him that the method used up more silver by absorption in the paper, else he would not have been so complacent.

There is one other fact that has impressed itself on me which seems to have escaped general notice; that is, when papers are employed which bleach greatly in the toning and fixing process, and which lose the delicate half-tones. In strong negatives, an exposure of the paper, previous to printing, to the action of light until it is somewhat grey, will entirely prevent any loss of detail, and the bleaching action of the toning bath seems to be exhausted on the whites, so that really no degradation of high lights is noticeable in the finished print. This fact is really very valuable, when properly used, with certain classes of negatives and papers.—I am, yours, &c.,
 Baltimore, December 26, 1899.

D. BACHRACH.

DOES BACKING SLOW A PLATE?

To the Editors.

GENTLEMEN,—Some remarks have been made in the JOURNAL which tend to the belief that backed plates become slower in consequence of being so treated.

I have carefully backed every plate used for ten years past with great advantage in result, and I do not think it makes the slightest difference; but I fancy the idea has grown up in consequence of the greater clearness of the image resulting from backing, and from the undoubted fact that backed plates can be given much longer exposures than usual without showing the well-known results of over-exposure.

If you back only half of a plate and expose it to a test landscape, i.e., one in which halation is very likely to be present on its development, after a full (not necessarily excessive) exposure, it will show a marked difference between the backed and unbacked portions, flatness and want of crispness of the overlapping portions, and gradation of distances in the unbacked part, and brightness and well-defined edges in distances in the other, though practically identical as to detail and density.

What appears to me to take place is this: The unbacked film suffers throughout from a modified form of halation in every bit of detail where there is a variation in gradation of tone, best appreciated in gradation of distances, and, if examined under a magnifier, will be found to be blurred at every such edge, melting into each other, and causing the well-known flat and smudgy effect of over-exposure, whilst the backed film is preserved from this degrading effect and comes out clean, crisp, and true in its gradations, in fact it is saved to a large extent from the natural results of over-exposure by the backing.

Thus people see that longer exposure can be given without the fatal results of over-exposure, and they jump to the conclusion that because they see a much cleaner result (which is characteristic and correct, or even slight under-exposure), therefore the plate must be slower in speed in consequence of being backed; the true test is to place the result of backing or no backing side by side on the same plate, preferably a large one, and examine them carefully for halation, but this knowledge is a comfortable one for the operator in making an exposure, that, if he thinks he might err a little on the outside of what he believes to be absolutely correct time, he will not be punished by finding a flat and washy-looking result in his negative on development.—I am, yours, &c.,

"LUX."

COPYRIGHT.

To the Editors.

GENTLEMEN,—In your Answers to Correspondents' column a week ago, I noticed that you said it is fraudulent to mark a photograph copyright which has not been registered at Stationers' Hall. I think you must have overlooked the fact that copyright is a genuine property previous to registration, and that therefore a copyright photograph may be quite rightly marked copyright, although such copyright be unregistered.

I have noticed that at least one eminent photographer publishes a notice to the effect that he reserves the copyright of *all* portraits taken by him.

It would be very useful for the profession generally to know whether such a notice does really secure the copyright to the photographer.

If it does, it seems to me so essentially conducive to the standing and interest of the profession that every photographer who respects his craft should print it on his price-lists, prospectuses, or similar means of communication with his *clientèle*.

It would at once protect him from the unauthorised reproduction of his work by any other person or firm. He would be released from the loss and mortification of seeing his work reproduced at trade rates to private customers by trade enlarging firms and free-portrait swindles; the first-rate professional would no longer have to suffer incompetent fifth-rate rivals to reproduce and enlarge his work at ridiculously low charges and in a quality of work which is a perfect horror to a man of taste.

and the illustrated press would have to treat with the photographer direct for every photograph reproduced, besides many other advantages to the professional needless to enumerate. I think there is little fear of objection to this arrangement on the part of the general public, which is usually fair, and would willingly agree to the photographer who sows reaping a full and just harvest in return for his work.

The validity of the copyright under the circumstances stated above would, no doubt, depend on the validity of the contract between photographer and client made by the notice of retention of copyright, whether that be a binding agreement, or whether a written agreement, signed by both parties, be necessary. Perhaps some of your readers learned in the law will enlighten us.

Photographers generally, even at this date, have not one-tenth the knowledge they should have of copyright matters.—I am, yours, &c.,

RALPH W. ROBINSON.

4 and 6, Linkfield-corner, Redhill, Surrey, January 8, 1900.

A LUNAR PHENOMENON.

To the Editors.

GENTLEMEN,—It was with no languid interest that I read, in your issue of December 29, Allan Blair's highly entertaining account of his attempt to photograph the meteors. It intensified my satisfaction at having successfully resisted the temptation to make the same venture myself. He would have my hearty sympathy for his non-success but for one thing. I would have given more than one night's sleep to witness, as he had the great good fortune to do, what may be unhesitatingly termed the most marvellous phenomenon in the history of astronomy. He may truly congratulate himself on having patiently outstayed all other watchers, and long after they had slipped away to rest had his reward in seeing that most unique event; for, as he tells us (in the twenty-third line, second column, p. 829), "the moon sank below the eastern horizon," and "in a blaze of golden glory," too.—I am, yours, &c.,

136, Calabria-road, Highbury, N.

JOHN H. GOUDAY.

[Italics mine]

Answers to Correspondents.

*** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

*** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

*** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

R. W. Wicks, 57, Clarence-square, Brighton.—(1) Photograph of wreckage; and (2) Engine on line at railway accident at Wivelsfield.

FINCHLEY.—Your question was answered on December 15 last.

P. O. MOUNTANT.—T. STOKOE asks for a good receipt for P.O.P. mountant.—Freshly made starch paste. Messrs. Fallowfield supply an excellent mountant for the purpose.

BLACKENING ALUMINIUM.—MANCUNIUM asks: "Will you please inform me of some method of blackening aluminium without the application of heat?"—If the metal cannot be heated, we can suggest nothing better than diluted brown, hard varnish, to which is added some "drop black." Bates's dead-black varnish would probably be more convenient.

THE ROYAL BIORAMA.—F. HOPE says: "Can you inform me the address of the works of the Royal Biorama, the living pictures now appearing at Olympia?"—In reply: We have not seen the particular exhibition referred to, but we imagine that the films are obtained from the Warwick Company, Warwick-court, or Messrs. Fuerst Brothers, Philpot-lane, E.C.

COLLOTYPE PRESS.—W. LOTZ asks what make and size of press we recommend for colotype printing to produce about 1200 pictures, 8×6 inches, the day?—To produce that number of prints per day from one plate, a colotype machine will be required. Such machines are supplied by Furnival & Co., St. Bride-street, E.C., and by Schmiers, Werner, & Stein, of Leipsic.

PHOTOGRAPHING A PRINT FROM A BOOK.—AMATEUR says: "Could you tell me how to photograph a print from a book. There is printed matter on the other side of the page, and, the papers being rather thin, the printing shows through on to the picture, both the black images of the letters and also raised impressions of them showing the picture is of a piece of scientific apparatus, and therefore must be copied in the finest detail."—If the print shows through the paper, we do not see how it can be avoided in the copy. The trouble may, however, be mitigated by backing up the picture with a piece of white paper before copying it.

SPENCE'S METAL.—H. REID asks: "What is the alloy known as Spence's Metal, its melting point, and whether it differs from ordinary fusible metal; also, where it can be obtained?"—Spence's Metal is not a metal at all, but a sulphur sulphide. Its melting point is somewhere about 250° F. We cannot say where it can be obtained, or if it is now an article of commerce.

BOOKS.—Probably the three books most suited to your requirements would be the *Science and Practice of Photography*, by Chapman Jones, published by Iliffe, St. Bride-street, E.C.; the *Studio and what to do with it*, by H. P. Robinson, published by Sampson Low & Co., Fetter-lane; and *Posing and Lighting*, by Inglis, published by Dawbarn & Ward, 6, Farringdon-avenue, E.C.

BAS-RELIEF PORTRAITS.—T. C. J. says: "I wish to make some bas-relief portraits, but I find there are several patents in connexion with them. I have found a method for producing them, that was published fifteen or twenty years ago, that will answer my purpose very well, and it is very similar to some of the recently patented ones. Shall I be getting into trouble if I use that old method?"—No. You are perfectly at liberty to work by any method that was published prior to the patents, even though any of them may be exactly the same thing.

A LIGHT QUESTION.—J. D. H. writes: "Can a neighbour block out a photographer's light? The facts are these: My studio is at the top of the house, two stories, and my next-door neighbour is going to put another story on the top of his, and, if I cannot stop him, I shall practically lose all my side light, a very serious matter to me. Cannot I prevent him from interfering with my light, which is necessary for my business?"—Yes, if you can claim "Ancient lights," but not without. If your studio has been built twenty years, you can prevent your neighbour from interfering with your "Ancient lights."

LARGE PORTRAITS DIRECT.—H. CONWAY says: "I want to take large direct portraits on 18×15 plates. The largest lens I have is a rapid rectilinear of eighteen inches focus, and, when stopped down, covers that size plate up to the edges. I have done a few, but, though perfectly sharp, they do not seem to please any one. Can you account for this, as the photographs are really good?"—Yes, easily. When they are taken with such a short-focus lens, the perspective is too violent to be pleasant to any one. To take 18×15 portraits direct, a lens of double at least the focal length of the one used should be employed. See article on the subject that appeared a few weeks back.

CLAUSE IN LEASE.—R. C. writes: "I have a house in a private road, through which there is a large traffic, on a seven years' lease, and I find I can, at a small cost, convert the two top rooms into a photographic studio. Can the landlord prevent me doing this? There is a clause in the lease that no business is to be carried on on the premises. What I wish to know is whether photography can be considered, in law, a business. Is it not a profession?"—In reply: We should say that the landlord could prevent the alterations in the structure. Any how, he could compel reinstatement at the end of the tenancy. There is little question that photography would be considered a business in the eyes of the law.

COLOURS IN P.O.P.—T. C. R. says: "In using aniline colours for P.O.P., I find that the colours entirely disappear or sink through the surface when dry. I have used a two-and-a-half per cent. of albumen with the anilines, both with the colours, and brushed over surface of print, with the same result. Can you, through the pages of your valuable JOURNAL, suggest a means of keeping the colours on the surface when dry? They are all right so long as the colours are wet, but, on drying, entirely disappear, and, if again wetted by soaking in water, the colours appear again."—Possibly the colours were used too dilute, or they were not of a suitable kind. Messrs. Houghton & Sons supply special colours that would probably be just what you require. Try them.

PAYMENT OF TRAVELLING EXPENSES.—MONEY says: "About two years ago I was engaged as operator and retoucher, for a branch, and, though nothing was stated in our letters with regard to expenses incurred in the journey, they were verbally promised me when I arrived at my destination. The principal now being ill and on my pressing for payment, his representatives refuse to recognise my claim. Have I any legal standing in the matter, and can I force my claim? I have always understood that it is usual in photography to have travelling expenses paid or defrayed."—As you have been in the situation for two years, and during the time have, apparently, made no claim for the travelling expenses, we do not think you can now recover them. You should have got them at the time.

FERROTYPES.—M. P. says: "Will you tell me where I am at fault? I am going in for ferrotypes. I have made up my bath and developers as follows, but can get no image at all on the exposed plates. Bath: Nitrate of silver, Reay's, 5 ounces; distilled water, 80 fluid ounces; nitric acid, pure, 12 minims. When dissolved, add iodide of potass and filter. I have coated a glass plate with collodion, and left it in the bath for several hours. Bath was made up twenty-four hours before using. I have used the following without any success. Developers: Protosulphate of iron, 6 ounces; nitrate of baryta, 4 ounces; alcohol, 4 ounces; nitric acid, 2½ drachms; water, 80 ounces. Also: Ferrous sulphate, 150 grains; glacial acetic acid, ½ ounce; nitric acid, 5 minims; alcohol, ½ ounce; water, 10 ounces. Is there a good book on this business? Please give name and price?"—If the plate was left in the bath for several hours, we are not at all surprised at failure. The plate should only be left in it for three or four minutes, or only sufficient for it to lose its "greasy" appearance. The bath is also rather weak; it should not be less than 30 grains to the ounce. Any of the old manuals on photography—Hughes's, for example—give full details. If we mistake not, Fallowfields have a small work on the ferrotype process.

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EX CATHEDRÂ.

THE war, which at its outbreak made professional photographers as a class somewhat busy, is at the present time having an adverse effect on many branches of trade, and photographic manufacturers and dealers are not escaping the general depression. We have heard from several firms, notably some which very largely rely on the winter trade in lantern goods, that the South African struggle has seriously interfered with their business this season. Much the same story reaches us from many other representative sources of photographic manufacture. It is to be hoped that the speedy termination of hostilities will be followed by the restoration of all departments of industry to that level of prosperity at which only a condition of peace can maintain it.

* * *

AMERICAN photography, we gather from our exchanges, is likely to enjoy a larger share of representation at the Paris Exposition than photographic work produced in the British Isles. New York City will be illustrated by a relief map of the Greater City, which is reported to be now in process of

construction by the City Engineer's Department, and which is to measure 24 x 28 feet when completed. Furthermore, in connexion with this enormous map it is proposed to display a large number of photographs and drawings of the most prominent buildings at present erected and under way. It is said that \$10,000 has been appropriated for the relief map alone.

* * *

THE American Government also proposes sending a complete series of photographs, representing many of the special commercial industries of the country, and views from the fifty-four agricultural experiment stations of the United States, all of which are being prepared and collected by Mr. Charles Richardson Dodge, of Washington, who represents the Secretary of Agriculture in this matter. The prints will all be mounted either singly or in groups on 22 x 28 cards, which will be arranged in classes and enclosed in portfolios, which will be classified and titled. They will illustrate, among many other things, such industries as the catching and preparing of fish for food ; the meat-packing industry, showing in detail its numerous steps, from the cattle grazing "on the hoof" to the shipment of the prepared packages ; bee-raising and dairy farming, fruit-canning and tobacco cultivation, and a vast number of other branches of American industrial life.

* * *

AFTER having been before the world for eight or nine years, tele-photography has been discovered by one of our daily contemporaries in connexion with its possible uses in the South African War. Tele-photography, it says, is a long word, but the range of the tele-photo lens is long also ; and, remembering that the camera has made more than one stride since Daguerre first experimented with iodine and copper (*sic*), one reads with surprise of English officers sniped while sketching. French balloonists, we believe, have achieved some remarkable results, not only by personal use of the camera, but by a system of plates automatically exposed at different heights in different directions. There seems some difficulty in ascertaining the exact use which we ourselves have made of photography during the present war ; but, as has been pointed out, there is a new (!!) tele-photo lens which has been able to show the clearest detail at a range of forty miles, and at a range of four, say, it

might be expected to do even better. But that the pencil should still be preferred to the plate is surely an anomaly nowadays. We would not overwhelm the War Office with demands; let us call this a hint." And we say this: That it would probably pay an educated photographer to rent an office in the neighbourhood of Fleet-street, and set up as expert photographic adviser to the "great" London newspapers. A nightly glance over their proof-sheets would save them publishing no end of erroneous twaddle about photography.

* * *

WE learn that a revised and enlarged edition of Captain Sir W. de W. Abney's *Instruction in Photography* will shortly be published by Messrs. Sampson Low, Marston, & Co., of Fetter-lane. The work, which has been brought up to date, includes fresh chapters on Photo-lithography, Photo-engraving, and kindred processes. Probably no book on photography in the English language has passed through so many editions as the *Instruction*, or has so frequently been utilised as a basis upon which other books on the subject have been founded.

* * *

SEVERAL of our contemporaries have stated that Dr. Emil Berger has constructed a binocular microscope which admits of seeing objects plastically (*i.e.*, in relief), and one of them adds: "If the news is credible, Dr. Berger's invention will prove a great boon to the hundreds of thousands whose profession forces them to use a microscope." Commenting on this discovery, "F.R.A.S.", of the *English Mechanic*, points out that as far back as 1851—forty-nine years ago—Professor Riddell, of New Orleans, devised a binocular microscope for exhibiting objects stereoscopically, or apparently solid. He was speedily followed by Mr. Wenham, in London, and by M. Nachet, in Paris. Then we had Stephenson's form, and later still the binocular eyepieces of Tolles and Abbe. The idea, he adds, of there being any novelty in the mere obtaining of stereoscopic vision by a binocular microscope is simply ridiculous.

* * *

TWO of the February meetings at the Society of Arts should be of very great interest to photographers. On the 14th Professor R. W. Wood is to lecture on the "Diffraction Process of Colour Photography," which he fully described last year in the *Philosophical Magazine*, *Nature*, and other periodicals. A résumé of those writings appears in our ALMANAC for 1900. On February 21, Mr. Edwin Bale is to give a paper on "Artistic Copyright." We hope that Mr. Bale will have something to say regarding those provisions of the Copyright Bill that was introduced to the House of Lords last session, and which sought to substitute for the present satisfactory law of photographic copyright a grossly unjust and tyrannical series of enactments. Those interested in the subject should make a point of attending the meeting, which we commend to the special notice of the Committee of the Photographic Copyright Union.

* * *

AT the [Education] Exhibition, now open at the Imperial Institute, South Kensington, a portion of the Cambridge University exhibit consists of a series of 10 x 8, 12 x 10, and 15 x 12 sepia platinotype photographs closed framed in walnut, and representing interesting bits of the University side of Cambridge. These are the work of that excellent photographer, Mr. F. H. Sanderson, the inventor of the Sanderson

camera, while his partner, Mr. Goodrich, is represented by a Royal group, taken several years ago. The firm is now busily engaged in illustrating eighteen volumes of a new history of the University.

PERSONAL DANGER IN PHOTOGRAPHY.

WRITING without any desire to be alarmist or to arouse attention in Accident Insurance Offices to the profession, inimical to the interests of its members, we may yet point out that the practice of photography entails personal risks absent in many other callings. It may, of course, be said that every walk of life has its own risks; literally speaking, it would be true. A man has been known to strangle himself with one of his own neckties; the patentee of a new form of a dog chain committed suicide by means of a sample of his patent; it was but a short time since that one of the largest provision dealers in the country was fined for adulterating his sugar with twenty-five per cent of paving stones (ground to powder), and the results to any employé incautious enough to take a packet home to his family can be easily imagined. The tale could be increased indefinitely; but these are usual, if not trivial, accidents, and do not compare with the real risks besetting dark-room and studio work. Fire insurance companies certainly entertain an idea that there is risk from their standpoint, as they ask a premium of an unconscionably large rate, and wherever danger of fire is danger to the person exists. It used to be explained that the use of collodion was attended with danger, but, although it is little employed now, the rates are not lowered in consequence.

In referring *seriatim* to the various risks we may suitably start with collodion. First, we may treat of the acids for pyroxyline-making, which entail many dangers in their handling. In using the mineral acids there is always one point to remember, and that is to be careful (and especially is this the case when the acid is stored in carboys) that, in restoring the containing vessel to its upright position after inclining it for pouring from, it be not done with a jerk or suddenly.

This is no idle advice, for we have known instances of persons being blinded by a drop of acid spurting from the neck of the bottle into the eyes; and it is only a few years ago since we recorded a serious injury to the eyes of a society man, who was compelled to leave his party out photographing in Norway and return to England through ammonia spurting into his eye when opening a small bottle of that liquid. Similarly we recorded the death of a young man who, pouring nitric acid out of a Winchester quart, accidentally dropped the bottle on the floor, and, through inhaling some of the fumes so suddenly evolved, succumbed in a day or two to the injuries consequent to his lungs. The gun-cotton, or, more correctly speaking, the pyroxyline used as the basis of collodion, is, on the other hand, not so dangerous as usually supposed, it is not much more explosive than dry cotton-wool.

Again, speaking of danger to the eyesight, it is common knowledge that the practice of retouching involves considerable risk of its impairment, the chief precautions to be taken being to use spectacles the moment it is found that the work is more easily seen when removed a little farther from the eyes. We have also, as have most of our readers, heard many complaints of the strain to the eyesight from the reddish light of the dark room or of the dry-plate manufactory. Care should be taken not to come into the comparative glare of

broad daylight too suddenly and frequently when the eyes have only experienced the red illumination for some considerable time.

We spoke of fire risks, and before leaving the topic we might, while not forgetting the danger of spilling varnish and igniting it at the fire or flame used to heat the negative, call attention to the governing conditions, not always known or thought of, that the danger of fire in using collodion lies in the fact that the vapour of ether, being heavier than air, falls and travels along the floor, and, being explosive and inflammable, may be set on fire at some distance from the pouring bottle if in its way it meets a naked flame.

Again, it is only a week or two ago since we warned our readers against the incautious handling of flashlight powders, or mixing the constituent ingredients by any metal stirrer. As to the danger from the most popular hobby of the day—the use of acetylene—that is well known, and too many sad fatal accidents have already happened through its employment. We must, however, say that, now the curious causes of explosion have been discovered, and attention has been drawn to them, it can scarcely be put down to the account of this gas if the precautions are neglected and accident occur.

Returning to a survey of the chemicals used, it will at once be seen that there is a sufficiency of risk to every photographer. There is danger of accidental poisoning through misadventure with cyanide of potassium, bichloride of mercury, or oxalic acid—all chemicals to be found in use by the all-round photographer, while well-used hypo fixing solution is very poisonous. Another aspect of chemical risks lies in the danger to the hands through the use of such chemicals as bichromate of potassium or developing agents like metol—a very real danger of serious evil to some people, although this is a matter of idiosyncrasy.

Science has lately added another risk to the practising photographer in the use of the Röntgen rays, which, if allowed to fall for too long a time, or too frequently, upon the skin are capable of inducing acute dermatitis.

We may conclude our survey by a reference to one or two of the minor risks, such as the frequent occurrence of cut fingers through handling accidentally broken plates in a dim light, or getting nasty wounds through glass splinters entering the fingers. In another direction we may refer to the experience of a well-known professional, who tells us he always keeps suitable remedies for cut fingers at hand, as it has invariably happened that, when a new hand starts cutting prints with a glass shape, a badly cut finger seems a necessity of the initiation.

We think we have made good the just views of the title to this article, but, at the same time, we may say ordinary care would ensure the avoidance of almost every one of the risks we have tabulated.

Another Picture Lost to England.—We have more than once referred to the number of pictures that leave this country for the States. Many of our readers will be familiar with Sir Benjamin West's picture of the *Raising of Lazarus*, which has been a conspicuous feature of the screen of Winchester Cathedral for over a hundred years. This work has now been sold, much to the regret of the diocese generally, to an American firm for fifteen hundred pounds. A number of criticisms have been passed upon the Dean and Chapter for the sale, and Dean Stephens replies that the picture was not presented to the Cathedral, as supposed, but was purchased in 1781. Nevertheless, the picture is sold by the Dean and Chapter and goes to America, hence once more fine work is lost

to this country. The reason given for the sale is that it was, in the Cathedral, "out of keeping with all its surroundings." Be that, according to the idea of the Dean and Chapter, as it may, we should have liked the picture to have been sold to an English firm rather than an American one; then it might have been retained in the country of its production.

The Three-colour Process for Artistic Illustration.

—Last week we quoted from a daily contemporary some adverse criticisms on the three-colour process for purposes of artistic illustration. The writer, in a further note, says that Mr. Hentschel sends him a very interesting letter, in which he points out that the three-colour process is still in its infancy. But how good or bad it is cannot be told from any of the pictures he sends, rejoins the critic. Wash has got to be made in colour specially for reproduction, just as you must draw with a pen if you want to get a perfect line block. "We certainly have seen some remarkable results from his colour process. But we have one suggestion to offer him. Let him get a clever and intelligent artist to make some drawings in three colours, and have these colours put down like mosaic, side by side, and not superimposed; or let him try to reproduce a Japanese print containing three colours. He will then discover how good or bad his process is. That we are right in suggesting such a method is proved by the fact that the best reproduction he sends us is a page of illuminated manuscript, where the colours are only three or four in number and perfectly flat. But has not in this a fourth printing been added to get the gold?"

Artists and Photographers' Photographs.—The same writer, whose identity it is not difficult to discover, delivers himself of the following ideas on photography *apropos* of some photographs from the Leusart series by Alfred Lys Baldry and W. J. Day recently sent him. "They seem to be clear and sharp," he remarks, "as everything photographed should be; but we hardly see what they are intended for. They can scarcely be, like so many so-called artists' photographs, which are always of the most artless character, for use, to save the difficulty of drawing from a model by tracing over a print; they can scarcely be considered as decorations. These prints only seem to us to prove that, even if an artist and photographer deliberately try to make mechanical pictures, they are doomed to failure. The human form is not often divine, and the camera does not idealise it." The writer's ideas on the possibilities of three-colour and monochrome photography will, we imagine, find little endorsement at the hands of those who have given practical attention to both subjects.

The Admiralty and X Rays.—Severe comments have been made on the War Office departments as to the neglect by them of Röntgen's discovery, and its utility in alleviating suffering on the battlefield. It now appears that there is an apparatus in use there, and we know that the hospital ships, the *Princess of Wales* and the *Maine*, took with them very complete X-ray installations; but these were not supplied by Government. There is no question that this valuable discovery of Röntgen has been far too tardily recognised by the powers that be. It is satisfactory, however, to know that at last they have done something in that direction, as we now learn that the Admiralty has appointed a civilian expert at Plymouth to give a number of naval medical officers in the Royal Naval Hospital a course of instruction in the use of the Röntgen rays in surgical cases. When reading this, one cannot help wondering why, considering the time the rays have been in use in the hospital and their value demonstrated, the thing has not been done before; also why the Army medical staff did not receive similar instruction, and why it was not supplied with proper field equipments before it was dispatched to South Africa? Verily our Government moves slowly, and it takes it a long time to recognise any new discovery, however valuable. Red tape binds tightly!

Acetylene again.—In a suburban paper we read that, at Acton, there has been another serious accident with acetylene. It appears, from the report, that a lad entered an outhouse where an acetylene gas apparatus was situated, and in some way brought about an explosion, with the result that he was terribly injured about the face and head, part of the skull being fractured. It is unfortunate for the future of this illuminant that we read of so many accidents with it, though they can all be attributed to carelessness or lack of knowledge of its properties by those having to do with it. The restrictions and conditions laid down by the County Council and the insurance companies have been severely commented upon as retarding the more general adoption of the acetylene light, but these continually occurring accidents tend to show that they are fully warranted.

ON THINGS IN GENERAL.

THE great event of the year. No, kind reader, I am not contemplating writing a single word on the great century or no-century beginning controversy; this is a serious journal, and our Editor, I am sure, would at once put his foot down upon any attempt at that kind of frivolity. The great event of the year is, I was about to say when interrupted, THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC. I had intended to say so last week, but have been engaged most of the time since in trying to fog out the pagination. What a pity the printers did not put a key to the pages on the front page where they tell us where to find the indexes and other useful trifles hid among such a heap of good things. There is enough solid, substantial, satisfying reading in the book to last for a twelvemonth. It is a great book—1548 pages—never mind the fact that the last page says 1516, not including the covers (mine is a handsomely bound library edition). A man given to much photography hit it off in the vernacular the other day in the crusted old saying “it is as full of good stuff as an egg’s full of meat.” And he was right; but I will pass on from this, for, as good wine needs no bush, every photographer will ere this have found out for himself what a treasure of a shilling’s-worth this cyclopaedia of photographic knowledge is. I have read many of the articles with much interest, some being worth each the whole price of the book. I cannot, however, avoid noting one article, “Time-tables on Enlargements of Bromide Paper.” The writer is evidently familiar with his subject, but by some unaccountable error has misquoted Mr. Debenham’s valuable instructions regarding the time of exposure needed as plates increase in size. He makes Mr. Debenham responsible for the dictum that the exposure is a function of the square of the figures obtained by adding together the measurements of the two sides of the plate. So that, according to this system, the exposures used when a negative is enlarged to 12×10 in. or to 16×6 in., say, would not differ. Obviously, Mr. Debenham’s instructions, which would well repay reprinting periodically, are very different from this.

I am fearful of being accused of attempting to gild the lily, yet, taking the risk, I am about to suggest an extra department in future ALMANACS. It is all very well, and very instructive, to keep on telling us what to do; my suggestion is to have a corner telling us what not to do. Numbers of amateurs anxious to excel are naturally desirous of trying many of the clever dodges recommended in various papers by various writers; but, as I need not say, many of them need a sign-post, which my friend of the vernacular just quoted suggests should be painted with one word, “ROT.” He is rather vulgar, as you will see. Perhaps an example may be given of what I mean. I noted the other day the instruction given (from a high authority) to keep sulphite of soda in fifty per cent. solution; the said H. A. remarked that he always did it. The question arises, What did he put in his precious fifty per cent. concoction? Certainly neither chemically nor commercial sulphite of soda, for, to keep that salt dissolved for six months apparently quite unaltered, outside of a special heating apparatus, would need a conjuror, and a clever one at that.

One more example. A writer signing himself a “Professional Photographer” instructs us how to dry a negative quickly: Wipe it

as dry as possible, and then hold before the fire from four to eight minutes, or, failing that, to put in the sun if it be very hot. Now, really this is trusting to our confiding innocence rather too greatly. Perhaps, however, it is a joke, for such treatment would ruin any ordinary negative. The funniest picture I ever saw was treated this way by an amateur I know. The negative was nearly, but not quite, dry; he was anxious to see a print, so he put the half-dry negative in the sun—not very hot this time. In a short time the whole film became such a mass of distortion that his favourite daughter came out apparently about fifteen feet six inches high, and she really is not so tall as that. It was such a very droll thing, that he made an enlargement from it [and hung it in his drawing-room. I wanted him to exhibit it, but he was sure it would be rejected; but now he is considering whether he would not have a chance at the Salon. If it should be shown there, my readers will now know the inner history of the picture.

Whatever Mr. Bolas writes about, he generally illumines with strong common sense, and I commend his informative paper upon focometers, read at the Royal, to the attention of those who may not have seen it. I think his suggestion as to the value, as a measuring instrument, of Mr. Dallmeyer’s focometer very valuable; but I think the line ought to be drawn at using it for measuring plates. Mr. Bolas makes a strong point as to the want of trustworthiness of the ordinary measuring apparatus. Let the focometer therefore, if needed, be used to verify measures, but let not every Tom, Dick, or Harry, who thinks his badly made dark slide justifies him in finding fault with his plate-maker’s glass-cutting, desecrate the instrument by taking his plate to it and measuring it. I am afraid a ticket would need putting over it after the fashion of the well-known advertisement with the similar illustrations, “Won’t wash clothes.”

I was just writing about sulphite of soda, and I might, with advantage, make a reference to another phase of the sulphite of soda question. Messrs. Lumière & Seyewetz have added another to their long list of valuable contributions to the technique of photographic manipulations in their instructions for making a mercury intensifier, and using it so as to obtain permanent results, a desideratum hitherto not obtained. I heartily commend it to the consideration and employment of any who desire to use an easy and trustworthy intensifier. But here is the point—there is not the slightest need to use anhydrous sulphite of soda in making up the solution as recommended. It is no doubt a useful form in which to keep it, but it is not to be found in one photographic store out of a hundred, nor in our chemists’, and for my own choice I prefer the crystals for all purposes. If they have gone wrong by absorption of oxygen, they will show it at a glance; but kept at all carefully—I keep them in a cask with a wooden lid—they do not readily change.

“Does backing a plate slow it?” seems to be agitating many bosoms just at present. Surely it is not difficult to settle the matter. Back one half of a plate and expose it, first the backed and then the unbacked half, to a sensitometer, say a Warnerke, and see what the results are. A little more doing and a little less saying.

All this agitation in favour of the metric system is not likely to lead to much among the older devotees of photography, or any other science. The fact is we cannot use grammes and cubic centimetres with facility unless we think in grammes and centimetres. We pass a grocer’s shop, and see hundreds of handy packets of tea piled up. How much do they hold? Most of us will say, as we think, “Oh, half a pound.” Our friends of the metric system would say, “Oh, just under a quarter of a kilogramme.” It is all a matter of habit, and we shall have to begin with the young ones if it is to be finally adopted. I, for one, hope it won’t be. For every-day life, our pound weight, our shilling pieces, our yards and feet, are infinitely preferable and much more convenient by reason of their adaptability to subdivision. Referring to tea again, it is a very simple thing to ask for an eighth of a pound as a couple of ounces, but what Englishwoman would go to her grocers and ask for 125 grammes of tea? Any one who knows anything about buying goods in France will tell us the same thing. In the very home of the metric system, the metric system, as a system, is practically non-existent, at any rate for domestic purchases.

"Wad some power the giftie gie us to see ourselves as ithers see us," and the apostrophe has been answered by the American writer quoted last week in these pages, some of his most scathing comments on the framings of our exhibition pictures not being given. It is to be hoped that his teaching may be taken to heart, for of all the pretentious, heavy, inharmonious surroundings to soulless, dead, washed-out leaden results of photographic manipulation, surely the exhibits of last year bear the palm.

FREE LANCE.

FRAUDULENT COPYRIGHT CLAIMS.

THE letter of Mr. Ralph W. Robinson in our last issue must not be allowed to pass without comment, otherwise it might be misleading to some. It is anent an answer we gave to a correspondent a short time ago, in which we said it was illegal to mark a photograph "copyright" in which no copyright existed. Mr. Robinson, in his communication, says: "I think you must have overlooked the fact that copyright is a genuine property previous to registration, and therefore a copyright photograph may be quite rightly marked copyright, although such copyright be unregistered." Just so, if the photograph *is* copyright. The query that we replied to was this: "A photographer here is in the habit of marking the portraits he takes of his sitters in the ordinary course of business, and for which he has been paid, 'copyright' . . . What I want to know is whether he can legally mark a photograph copyright when there is no copyright in it?" Our reply was, Certainly not.

The Copyright Act enacts that, when a painting or photograph is executed for a valuable consideration—*i.e.*, the sitter, in the case of a photograph, pays for the work—the copyright in the picture does not belong to the photographer, "unless it be expressly reserved to him by agreement *in writing*." Therefore, the photographer, it is manifest, has no copyright in portraits which he takes in the ordinary course of business, and is paid for taking, unless he has a special agreement *in writing* to that effect with the sitter. Unless he has a legal copyright, acquired under these conditions, it is illegal for him to mark the photographs copyright, as we told our querist.

Mr. Robinson mentions that "I have noticed that at least one eminent photographer publishes a notice to the effect that he reserves the copyright of *all* portraits taken by him," adding that "it would be very useful for the profession generally to know whether such a notice does really secure the copyright to the photographer." It is a little difficult to conceive how any one can retain what he does not possess, and there is no question that a photographer does not possess a copyright of a portrait he is paid for taking unless there is a special agreement to that effect *in writing* between him and his sitter. We quite agree with Mr. Robinson that it is hard upon the photographer that his work is occasionally reproduced at trade rates to private customers by trade enlarging firms and free-portrait swindlers, &c. But there is another side to the question. A person pays for a thing, and consequently he has the right to do what he likes with it. In the case of a photograph, which he has paid the photographer to take of him, why should he not have the right to have it reproduced, enlarged, or what not, as he may like, and by any one he chooses, whether the result is good, bad, or indifferent? That is his business; he is doing what he likes with his own. We merely allude to these facts because they exist, though they are not what many would have them; still they exist, and, we surmise, will not be altered, so must persevere be endured.

FOG ON PLATES—A QUESTION OF RESPONSIBILITY.

AN old correspondent of this JOURNAL, and a photographer of many years' experience, recently wrote us to the following effect: "I send you to-day, by parcel post, a negative, which, as you will see when it reaches you, has a dark rim around the four edges. It is a copy from another negative. It is an enlargement; the original is perfect. The same dark borders show on views taken direct. I made several trials, with different holders, with same results. What can be the cause if not in original plates, or manufacturer's fault? I am not a new hand at it, therefore cannot blame light in changing plates or developing; and then, why the four edges bad, only centre part perfect, free from fog or light. Camera, &c., twenty years old; holders same. Not the wood at fault,

as the grooves are, and have always been, unvarnished; and this defect only appears now, with a new lot of plates. If light, why four edges, and why also the rims, which are covered by wood, and should always be clear and not dark, as in this instance? With plates not keeping, I always found edges to be less sensitive; but here they seem to be more so. The plates are —, which I have used for twenty years. This is the first trouble. If you can help me I would be very much obliged, as you can see, having a great many dozens on hand yet."

From a careful examination of the negative, we suggested to our correspondent that the packing strips between the plates had, perhaps, not been pure, or the plates might have been stored in boxes giving off exhalations of a nature to affect the sensitive salts. To this our friend replied:—

"I thank you very much for your good advice. This said, I must say that I believe only one part of your sayings to be correct, and that is impure packing; this is proven by markings from paper on edges to separate plates, but here of little consequence. What is more important is the edges all around and the smoky-looking plate all through. The edges may be very well darkened by contact with paper packing all around but how about the balance of plate? As this may interest you somewhat in case of another complaint asking your advice, here are in a few words my trials to find out: Exposure in holder, plates in it for several weeks. Short exposures (ten seconds), small dark edges. Long exposure (ten minutes), larger edges dark. To find out if the holder is at fault; one edge covered with paper, others in contact as usual. After one week's contact result same, all around dark. Next exposure by contact in printing-frame plate right out from original packing, edges dark, the same. At last I developed a plate right from the original package without any exposure whatever, after fixing as usual, results: edges dark and plate smoky; so the original plates are at fault and not my holders. Now, as to exhalations from boxes, &c. Since fifteen years I live in my own house and store the *unopened* packages in the same place and box. From this the plates go direct to the holders to expose within more or less time, but never has that edge troubled before. After exposure I develop, taking plate, from holder direct, using no intermediate box; no damp, no fire, no smell. My opinion is that the origin is in the manufacture, and most probably in the substratum used to prevent frilling, as, if you kept my plate you can see on the edges the drying marks of it darkened and a dirty-looking edge all around, such as dust specks creeping up and showing granulated all around. This is better seen with a magnifying glass. Maybe you will remember a letter I wrote in the JOURNAL a few years ago asking why nowadays plates are no more as brilliant as heretofore, but all more or less foggy-looking; no answer came. Yet it is a fact. Look at it critically, and compare a negative of to-day and one ten years old."

This appears to be a clear case of lack of fault on the part of the photographer for the fogged condition of the plates. Perhaps in bringing the fact to the notice of the various firms of plate-manufacturers, we may be instrumental in assuring an avoidance of such troubles in future.

NEWS-PHOTOGRAPHY.

THE war between Britons and Boers in South Africa has directed a great deal of public attention to those portions of the illustrated press which are the work of the photographer-journalist; in the current saying, he has come very much to the front of late. As some interest may be felt in knowing to what extent this branch of journalism has developed in the United States, the home of journalistic enterprise, we reproduce from the *American Annual* a very readable article by Gilson Willets, which gives a vivid picture of the deft and ready manner in which the smart New York journalist uses his camera in the service of his paper:—

Not many months ago the newspapers depended, for pictures, almost entirely upon artists. The news was illustrated by sketches that sometimes resembled the real scene or person, but which usually looked like something or somebody else. All young women suicides, poisoners, and the like, were shown as the most beautiful creatures the artists could sketch. Events happening a thousand miles away were pictured "by our special artist on the spot," that is, by an imaginative disciple of the brush, sitting in the office of the newspaper that was paying for his sketches.

Now, all this slipshod, any-old-way of presenting the news in picture is abandoned—by enterprising newspapers, at least. The artist has been supplanted by the photographer. Every newspaper of importance employs a staff photographer, who has his corps of assistants. To all parts

of the city and the country—indeed, all over the world—the newspapers are sending photographers to gather the news with camera as well as with pen. These bright, active, daring men are now recognised as news-photographers, and their work is called news-photography.

News-photography is a sign language. Who runs may read it. By means of this language the busy man can learn the news at a glance. This news-photography tells news stories truthfully. None of the inaccuracies of the pen, no fiction, no exaggerating of facts, no news that is not news. A camera does not lie. It shows people as they really look, reproduces scenes with realistic exactness. No chance here for the city editor to make the ugly young woman suicide a beauty, no need of “faking” a picture of events that are happening on the other side of the world.

And it is to be noted, to the credit of the so-called yellow journals, that they were the first to adopt the camera—the truth-teller—in presenting the news. At increased expense the journals who make use of news-photography are obliged to use paper that will take hairpoints from a half-tone on a rapid press. The *New York Journal* was the first, the *World* followed, the *Herald* is now in line. So also are the leading papers of most of the large cities. Not that the newspapers were the original users of news-photography, for the weekly illustrated journals and the magazines used photographs long before newspapers printed any pictures of any kind, even sketches. And to-day the weeklies spend a great deal more money for news-photography than the newspapers.

The news-photographer's berth is no sinecure. He must get up before daylight to photograph a celebrity on an incoming ocean liner. He must travel two or three hundred miles in a single day, hiring a section on a train, or a state room on a boat, to be used as a dark room in which to develop his plates in transit. He must sit up the remainder of the night to develop, to artificially dry, and to make platinum or bromide prints of the flashlights which he has taken in the early evening—that he may deliver the photographs in the early morning. During the war with Spain, he had to go to the front and make pictures, amid every difficulty and without a single convenience, as best he could. He must go out in a blizzard and make storm scenes. He must stand all day and all night, too, in wait for the coming or going of a personage of news importance. Let him fail to get a single photograph which he went to make and, if he is on the staff, he is in danger of losing his position. Let him fail thrice and he is peremptorily dismissed.

Meantime he gets a good salary while on the staff, and excellent pay if a free-lance. One free-lance news-photographer in New York, that I know of, will not take his camera out for less than fifty dollars. Others get five dollars each for negatives, and sometimes an extra allowance for their time. When employed for a special purpose, the news-photographer's expenses are paid. If he makes pictures on speculation, he must, of course, pay his own expenses.

The best known news-photographers in this country are Joseph Byron, who is most famous for his flashlights; J. K. Hemment, of the *Journal* and *Leslie's Weekly*, who made such a fine record during the war; J. Hare, of *Collier's Weekly*, who also achieved a war record and who is such a persistent traveller; Vander Wyde, the celebrity expert; Hare and Hart, who make a specialty of naval news; and Bidwell, who attends to horse events. Of all these, Joseph Byron stands at the head. His work always combines the qualities of timeliness and art. These men, and many others equally worthy of mention, are constantly on the jump, earning their money by the hardest, most nerve-racking kind of labour.

In Havana I saw Hemment, and Hare, and Hart, all three working themselves to skeletons, making photographs of the wreck of the *Maine* and the stirring scenes in Havana. Vander Wyde works day and night, giving the daily papers the story of the news in surprisingly fine pictures. Byron seldom gets but a few hours' sleep o' nights, because of the necessity of developing, and having ready for delivery the next day, the flashlights of “first night” theatrical events, made during the evening.

It is obvious that the news-photographer must have a fine nose for news; must not flinch where others flee; must always look alive; give no quarter even to people who do not wish to be photographed. He is ordered to get a snap-shot of a well-known Society woman. He must follow that lady till he gets a chance to snap his camera, and he must press the button or uncap the lens at the right moment. I was with Byron one winter day, when he—and I, too—stood all day long in the bitter cold and blinding snow, at Lyndhurst-on-the-Hudson, to make a picture of Helen Gould when she should drive up to the castle door, on her return from the city. One hundred dollars was offered for this pic-

ture, but the reward was failure and two bad colds. Another news-photographer was recently ordered to get a snap-shot of Mrs. O. H. P. Belmont. It was a case of dead or alive—get the lady at all hazards. We shadowed her for three days, and at last got a flashlight of the great lady at night, just as she was stepping out of her carriage to enter Delmonico's ball-room. But, alack! even then the picture was only an excellent view of the lady's back. I had even a sadder experience recently in New York, when Admiral and Mrs. Sampson arrived from Cuba. I stood at the gangway on board the ship, and, when the Admiral began descending the boarding steps, I snapped my Kodak. Then, anxious to get Mrs. Sampson also, I snapped again without having turned the film-holder. The result was a blurred photograph, showing neither of the subjects.

The news-photographer must sacrifice art for subject-matter. The subject is everything; the excellence or the demerits of the photograph count for nothing for or against the worker. The idea is, Picture the news, whether the pictures are artistic or not. A poor picture of a public personage at a crucial, newsy moment is worth its weight in gold, while the finest, most artistic photograph of the same person at an unimportant moment is not worth the paper it is printed on. There is no time for posing the subject, or for taking the scene from the best point. Get the subject in the act, get action in the scene; these are the main objects.

News-photography is news-reporting, and the chief merit of a news-photograph lies in its timeliness. To-day the picture has a princely value, to-morrow no value at all. News-photographer Bidwell once sold a certain photograph of Cornelius Vanderbilt to one of the so-called yellow journals for ten dollars; ten minutes afterwards a rival paper offered twenty, fifty, a hundred, and actually two hundred dollars for a copy of that same particular photograph.

An article of this kind should end with practical suggestions regarding which cameras are best suited to news-photography. But, as no one camera is best for all work or for all operators, I can only say that the news-photographers I know best find a six by ten the most useful and most convenient for all-round general work. An eleven by fourteen instrument, with a long-focus lens, is found best adapted for sea work and long-range pictures. Shutters of a very rapid-acting type are an essential. When the use of these larger cameras is not always possible, a four by five snap-shot will be of excellent service. Indeed, for ordinary outdoor work, the success of which depends upon making a large number of exposures in the smallest possible time, the four by five snap has been proved to be the news-photographer's best friend.

A GLIMPSE AT “STEVENS'S.”

Who does not know Stevens's, the well-known Covent Garden auctioneer's, through whose rooms, week by week, an endless stream of photographic and general scientific apparatus makes its way from one set of possessors to another? In the current number of the *Strand Magazine*, Mr. F. Anstey, the author of that amusing book, *Vice-versa*, commences a new story, in the course of which one of the characters has to betake himself to a sale at Hammonds', the Covent Garden auctioneers. In an excellent bit of descriptive writing he gives us the following picture of the sale, which may be witnessed several mornings a week at King-street, Covent Garden: “In spite of the fact that it was the luncheon hour when Ventimore reached Hammonds' Auction Rooms, he found the big, sky-lighted gallery, where the sale of the furniture and effects of the late General Collingham was proceeding, crowded to a degree which showed that the deceased officer had some reputation as a connoisseur.”

“The narrow green-baize tables below the auctioneers' rostrum were occupied by professional dealers, one or two of them women, who sat, paper and pencil in hand, with much the same air of apparent apathy and real vigilance that may be noticed in the Casino at Monte Carlo. Around them stood a decorous and business-like crowd, mostly dealers, of various types. On a magisterial-looking bench sat the auctioneer, conducting the sale with a judicial impartiality and dignity which forbade him, even in his most laudatory comments, the faintest accent of enthusiasm.

“The October sunshine, striking through the glazed roof, regilded the tarnished gas stars, and suffused the dusty atmosphere with palest gold; but somehow the utter absence of excitement in the crowd, the calm, methodical tone of the auctioneer, and the occasional mournful cry of ‘Lot here, gentlemen!’ from the porter when any article was too large to move, all served to depress Ventimore's usually mercurial spirits.

“For all Horace knew, the collection as a whole might be of little value,

ut it very soon became clear that others besides Professor Futvoye had snatched out such gems as there were, also that the Professor had considerably under-rated the prices they were likely to fetch.

"Ventimore made his bids with all possible discretion, but time after time he found the competition for some perforated mosque lantern, engraved ewer, or ancient porcelain tile, so great that his limit was soon reached, and his sole consolation was that the article eventually changed hands for sums which were very nearly double the Professor's estimate.

"Several dealers and brokers, despairing of a bargain that day, left, murmuring profanities; most of those who remained ceased to take a serious interest in the proceedings, and consoled themselves with cheap Witticisms at every favourable occasion."

A USEFUL FORM OF STEREOSCOPIC.

A CONTRIBUTOR to the *American Annual* gives the following particulars of a stereoscope which he attributes to Dr. T. R. Robinson :

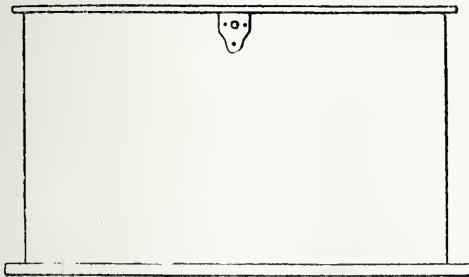


Fig. 1. The instrument when closed forms a case 13 inches long by 11 inches square (inside measure).

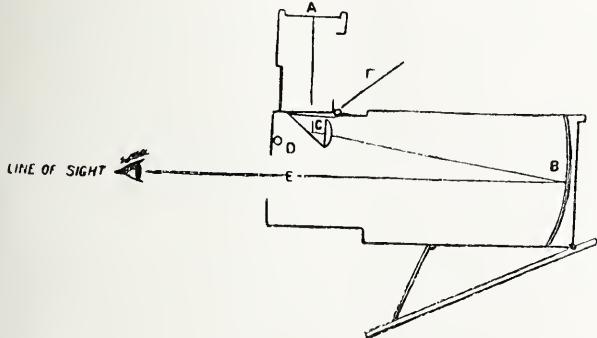


Fig. 2 shows the optical arrangement. A is where the slide faces downwards. C is a right-angled prism with two convex lenses cemented on its front face as shown, the centres of which are a little closer together than the views on the slide, and they form an inverted image on the large concave mirror, B, at the end of the case, and is viewed by the eyes through the opening, E; the top face of the prism is fixed in a line with the top of the case, and D is a milled head by which the part carrying the slide can be raised or lowered so as to adjust the instrument for distinct vision; Finally, F is a mirror for throwing the light up on to the slide.

The mirror (B) is 7 inches square and 11 inches focus. The prism (C) about 4 inches long, the sides including right angle $1\frac{3}{4}$ inches. Focus of lenses, 5 inches and $1\frac{1}{2}$ inches diameter.

DIFFICULTIES IN SILVER PRINTING.

THAT much may be done to produce a good print from a faulty negative, by means of dodging in printing as well as submitting the negative to special preparation prior to its being placed out to print, is a fact well known to every photographer who is possessed of even a moderate amount of photographic experience, and it is also well known that, in the hands of an expert printer, many seemingly useless negatives can be so manipulated as to cause really serviceable prints being pulled from them.

The numerous dodges to which printers resort in dealing with faulty negatives are now and again trotted out in the different handbooks and

other photographic literature, very much of which all run in the same groove, and too often savour of an amateurish nature, for professional printers know when to keep a good thing up their sleeve quite as well as any one.

That a deal may be done to improve the printing quality of a negative by subjecting it to one or other of the common every-day dodges, such as the application of ground glass or mineral paper to certain parts of its surface, and also by reducing over-density by any of the well-known methods so generally practised, is a fact recognised by every one; but, as a rule, all our handbooks and guides to photography stop here, leaving a student to worry over an indifferent-printing negative, and which, in his hands, is never capable of being made to yield anything like the results an expert printer can produce, simply by reason of the fact that the expert printer carries his treatment of a faulty negative a long way further than many might imagine.

During recent years the production of special photographs for reproduction by means of half-tone blocks has caused the utmost attention to be devoted to this branch of photography, and it is quite surprising what is now capable of being accomplished in the way of turning out high-class results from indifferent negatives.

Take, for instance, the case of a dimly lighted interior, in which a stained-glass window forms a prominent object in the view, the details of which are required to be faithfully rendered as well as the architectural features of the building surrounding the window, and we have a by no means easy subject to photograph without special means of lighting, only practised by a few expert architectural photographers. Even with their special knowledge of how best to photograph such a subject it is quite ten to one the negative they produce will be considerably improved by after-manipulation; but it is not only in the treatment to which such a negative is subjected that much of the final success in reproduction lies, there is what may be termed an intermediate stage of dodging not only the negative during its printing, but a very clever system of treating the actual print (during the time it may be said to be printing) in such a manner as completely stops the printing of those parts that are being over-done before the denser portions gain a sufficiency of depth. To many not experienced in printing difficult negatives this may appear almost an impossibility; but, as everything is easy when you know how to do it, so such a method of treating a faulty negative gives little thought or trouble to an expert printer.

When it is impossible to produce a fairly even print by means of ordinary printing, one of the most effectual means of gaining satisfactory prints from an uneven negative will be found to consist in subjecting those parts of the surface of the silver prints that are being over-done to a blocking-out operation, performed by applying a suitable water-colour pigment where it is desired to stop any further action of light. Many young printers, although quite appreciating the *rationale* of such a method, fail to understand how it is possible to obtain possession of a silver print so as to apply to its surface such a pigment in as careful a manner as is necessary without the removal of the print from the surface of the negative, and the consequent liability of being unable to register it in exactly the proper position, so as to avoid even the slightest semblance of what is termed movement in a printing frame.

In practice, however, there is no real difficulty in accomplishing such an operation, and, once a printer has ocular demonstration of this treatment of a print, he for all time coming would never think the operation a difficult one.

To carry out this seemingly difficult printing dodge, the negatives should be printed in frames a size or two larger than that of the negative itself. This is best accomplished by attaching the negative to the centre of a thick sheet of glass by means of strips of gummed paper, binding carefully round its edges, so that it will not move during the time it is in the printing frame. This done, the negative will be found firmly attached to a sheet of glass having a margin all round its sides. This margin is of service in the way of permitting a sheet of paper being used in printing that is larger in size than the negative, and will enable the side or one end of the printing paper being gummed or otherwise firmly attached to the glass support in such a manner as will permit of the negative and its glass support being removed from the printing frame as often as may be desired during the time of printing, so that the most careful examination of all portions of the surface of the print may be made.

The printing paper being of considerably larger size than the negative permits of the print being folded over. After the negative and its support are removed from the printing frame, when folded over, it enables any water-colour pigment, such as gamboge, or ivory or lamp-black, being carefully painted over the very finest part that may require to be stopped off from further printing, and, when the pigment is dry, the print is merely folded down in contact with the surface of the negative again, with the certainty of being in perfect registration. Of course, the application of the pigment is best conducted under a good lamp light, such as a powerful paraffin table lamp would yield in a darkened room. This prevents any degradation of the paper during inspection and manipulation. The painting of an opaque pigment on the surface of a silver print will cause no evil effects to the print, for the pigment will wash off in the first washing water, and the toning operation proceed as

usual, and there is also no difficulty in tracing over the minutest outline if merely an ordinary amount of care be taken and a suitable brush employed.

By this means an expert printer is possessed of almost unlimited power in the production of single as well as even combination prints. Faulty backgrounds being blocked out in the negative will enable any portion of a picture being printed on one negative to any extent, and, this being blocked off on the surface of the print, may then be removed to another negative, and quite a different background printed in.

The secret of success lies in so attaching the print to the surface of the glass support that the entire surface of the printing paper is capable of being got at without the possibility of the image showing any movement from the surface of the negative when readjusted.

To many this method of printing a negative may be considered difficult. In practice, however, it is quite easy of accomplishment, and, once practised, can be made to yield quite a number of particularly fine prints from negatives that would by many be discarded as unprintable.

T. N. ARMSTRONG.

COLOUR PHOTOGRAPHY: KRAYN'S SYSTEM OF VIEWING THE PICTURES.

In Herr Krayn's invention the object is to bring the development of the coloured picture before the eyes of the spectator in such a way that the latter sees at first what appears as an ordinary photograph, and not one that is affected by a colouring light filter, and thereafter part-pictures, appearing in the three ground colours, are successively brought to view, and the complete picture then appears in natural colours.

This purpose is attained by the arrangement of movable mirrors, and contingently also of movable screens in front of separate part-pictures.

In the position of rest, the two mirrors, which are employed for bringing to view two of the part-pictures into the optical axis of the ocular, are outside the range of view of the eye, and only the one part-picture is visible, that which lies directly in the optical axis of the ocular, and which, like the two others, is a glass diapositive in black and white, and is lighted by a white reflector behind. By means of a crank or clockwork, the disengaging of which can be effected by the insertion of a coin in any preferred manner, the mirrors are gradually carried into the interior of the apparatus and within the optic range of the eye, and at length attain, by means of a suitable mechanical arrangement, the

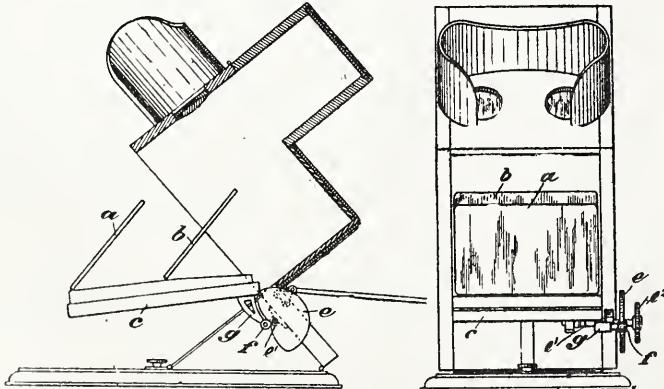


Fig. 1.

Fig. 2.

position in which the other two picture-parts, made visible by means of the mirrors, come into the optical axis of the ocular, and are covered at all points by the directly visible picture.

For automatic purposes the mechanism can be arranged in such a manner that the mirrors, after a certain time, return to the position of rest.

With the mechanism for moving the mirrors, the screens which are intended to cover the two diapositive part-pictures before the moving of the mirrors into the position for use can be so connected that they release the two diapositives successively. The white reflector also, which illuminates the directly visible picture-part, can be so moved aside when the mirrors are moved that the picture-part directly visible becomes illuminated by a yellow reflector placed below.

The movable screens, as also the white reflector, are, however, not absolutely necessary for the intended purpose, as without them the production or origination of the coloured picture will be clearly shown.

The directly visible picture is in this case illuminated by a yellow reflector, and appears in ordinary photographic tones on a bright yellow background whilst in the mirrors, which, in consequence of their position in relation to their axis of rotation, appear successively within the range of vision of the spectator's eye, the red and blue part-pictures become successively visible.

In the chromoscope, *a* and *b* are the two movable mirrors. These are supported by the plate, *c*, and move together with the latter around the axis, *d*. The motion itself is produced by means of a cam, *e*, on the circumference of which a small roller, *f*, supported by a bracket,

g, fixed to the plate, *c*, slides. On the shaft, *e*, of the cam, *e*, a tooth-wheel, *e*, for rotating the shaft, *e*, may be provided as shown in figs. 2 and 4. The rotation may also be effected directly by hand, through the medium of a crank keyed on the shaft, *e*.

The cam is so constructed that, when it makes a quarter turn, the mirrors are moved out of the position of rest into the working position; then, upon the execution of a further half-turn, the mirrors are left in

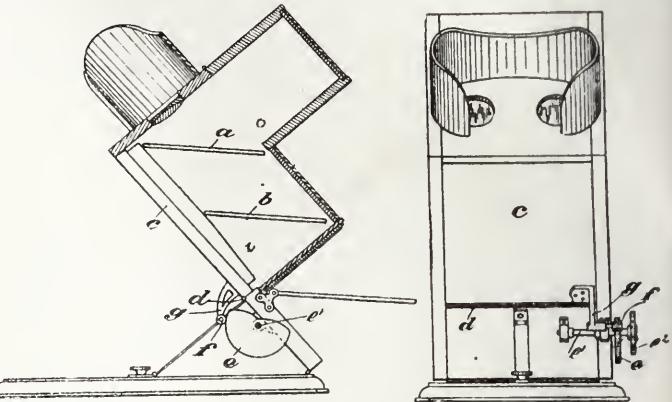


Fig. 3.

Fig. 4

the working position, and therefore, at the last quarter-turn, the mirrors are returned again to the position of rest.

In the position of rest for the mirrors, the small roller, *f*, is in the heart-shaped incision of the cam, *e*, as shown in fig. 1. Upon the cam being rotated, no matter in which direction, the roller is brought out of the heart-shape incision to the concentric circumference of the cam. As soon as this is effected, the mirrors take the working position indicated in fig. 3, in which the three part-pictures are superposed. The mirrors remain in their working position until the roller, *f*, leaves the concentric circumference of the cam, whereupon the mirrors move back again until the roller in the heart-shaped incision of the cam forms their immovable point of support.

NOTES ON MOUNTING STEREOSCOPIC PRINTS.

[Specially translated from the *Revue Suisse*.]

HAVING recently had occasion to mount a number of stereoscopic photographs, the empirical—not to say inaccurate—manner in which this operation is described in the special text-books on the subject led me to study the question for myself with some degree of care; as a result, I found that it is possible to conduct this operation according to determinate principles, the explanation of which is the object of this article.

I propose considering only those prints intended for examination in a direct vision stereoscope of the usual type, passing over the theory of mounting those larger prints for which special and rarely used apparatus is required.

Of course, the method of making stereoscopic prints is well known, viz., by the most usual plan of using a camera carrying two lenses, separated about three and a half inches, thus obtaining two views the planes in which are geometrically similar but slightly differently disposed. If we mount two stereoscopic prints on a card so that the two inside margins touch on what we may call the *axis* of the card, then it is easily shown that, if the distance between two *homologous** points in the foreground is called *d*, the distance, *d'*, between two homologous points in the distance, will be less than *d*. In the right-hand view the foreground is displaced towards the left in relation to the distance, whilst in the case of the left-hand view the opposite is the case. These homologous points are thus drawn towards the *axis* of each print, and therefore their distance apart is less than those of points in the foreground.† This difference of separation is, of course, not large; with lenses of 6 inches focal length it only amounts to .12 of an inch for planes situated 15 feet from the camera, a distance within which one would rarely go. At 30 feet the difference between *d* and *d'* is only .056 of an inch, whilst at 60 feet it falls to .028. It is this difference between homologous points in the two views that is the cause of the stereoscopic effect. As it is practically and inversely proportional to the distance of the different planes from the objective, it is evident that it sinks to a minimum as those distances increase. Consequently the sensation of relief can only be given in stereoscopic pictures in which the foreground is fairly close.

Imagine our two prints mounted on card, and exactly coincident (inner edge to inner edge) with the *axis* of the card. Let us further suppose that their breadth is equal to the distance, *d*, between homologous points

* I use this term to designate the points in each view corresponding to the same point in the subject.

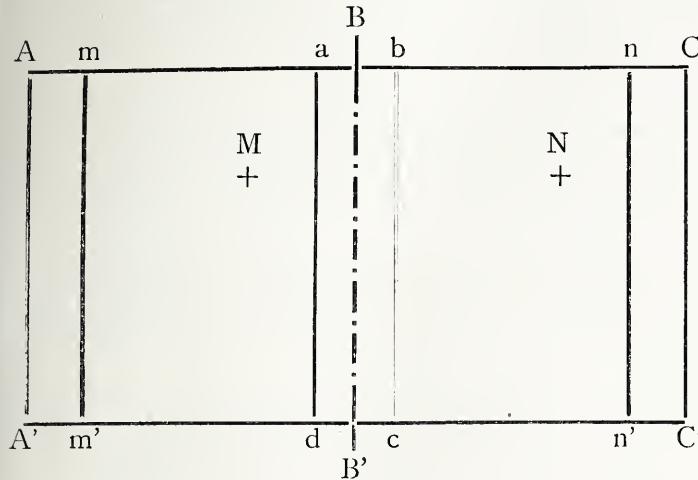
† If we call the focal length of the lenses *f*, their separation *l*, and the distance of the first plane considered, *A*, then calculation shows that

$$d' = d - f/l \times \frac{1}{A-f}$$

in the foreground. I will call this the *normal condition* of a stereoscopic view. This distance, approximately equal to the separation of the eyes of the observer, may vary from 2·56 to 3·35 inches without any inconvenience being felt.*

In the normal state the foreground will be identical in each print; each point will have its homologue in the other. This method of mounting is to be recommended more particularly for paper prints.

I ought to mention here a defect frequently observable in commercial stereoscopic views. Many stereoscopic photographers, following the erroneous directions in the manuals, get into the bad habit of making each of the two views (which meet at the centre of the card) broader than the distance between two homologous points. The natural result is that the points in the portions beyond the normal width have no homologues in the other view, and so do not aid the production of relief. Besides which, it is a necessary consequence of the way in which the majority of



stereoscopes are made that the left eye can always see part of the left edge of the right-hand image, a similar thing taking place in regard to the right eye. When the prints are normal, they exactly coincide, and the eye instinctively disregards the two edges of the images which surround the relief view on either side; but, when the images spread over their outside edges—that is to say, appear there as points without homologues—it is evident that the right eye will project the right-hand edge of the right-hand print to the same point in space where the left eye is projecting the left-hand edge of the same print. The same thing occurs in the case of the outside edge of the other print, and the total result is that the stereoscopic view is bounded on right and left by an irritating appearance of non-coincident images. This is an extremely annoying defect, and greatly detracts from the pleasure of examining stereoscopic prints.

I have before me a collection of views in which the photographer has made his prints 3·3 inches, whilst the separation of homologous points is only 2·76 inches. This difference of .56 of an inch greatly diminishes the stereoscopic effect of otherwise very excellent views.

Other stereoscopes do not possess this inconvenience, and are arranged so that each eye can see only that image which it ought to see. In those cases the superfluous portions of the edges are projected on the black partitions of the apparatus, and the stereoscopic view is bounded on either side by indistinct margins consisting of the parts of each print left without homologues. It is a very simple matter to convince oneself that to retain these parts without corresponding homologous parts is not only useless, but detrimental, to the whole effect.

My advice is to trim each print up to its homologous points. If a wide print is wanted, then a similarly wide separation of the corresponding points in the foreground must be insisted upon; but this must not exceed 3·35 inches, since, beyond this limit, the eye can obtain the sensation of relief only with some strain, and soon grows fatigued. It is better to make this distance and the width of the prints from 3 to 2·55 inches. One can have even narrower views than this latter dimension so long as the distance between homologous points is kept at this figure. This would, of course, mean that the prints would not meet at the centre of the mount.

Obviously, the same rules apply to stereoscopic transparencies, and, as the ground glass of commercial stereoscopes rarely exceeds five and a half inches in length, the width of the prints should never exceed or even reach two and three-quarter inches, i.e., the distance between their homologous points.

One point here must be insisted upon. Suppose we have two views in the normal state, i.e., in which the width, A B, or B C, is equal to the distance, M N, between two homologous points. It is usual to mount transparencies with a mask, by which they are separated, as shown at a b c d. If the outside edges at A' or C' are at the normal distance,

* Lenses are generally placed about 3½ inches apart, so as to give two views on a plate about 7 inches across. This amount of separation is a little too great for the printed views.

the views will embrace superfluous portions corresponding to the parts hidden under a b c d. The masks should be cut so that the outside border falls as shown at m m' and n n'.

It is even a good plan to bring these side masks, m m' and n n', closer to the centre so as to conceal in the right-hand image the homologous points of the line a d and in the left hand-image those of c b. The distance between the edges, a d and n n', or between m m' and b c, will be smaller than that between two homologous points, as M N, and it will therefore appear as though the mask were in front of the view; in other words, the sensation of relief will be enhanced by the suggestion that the scene is being viewed through a window. If, on the other hand, the edges of the mask fall on A' or C' or outside of these lines, the anachronism of the frame behind the view is produced. Perhaps I can explain better by taking an actual example. The masks of the photographic dépôt are sold with openings each 63 mm. (=2½ inches, very nearly), separated by a band 6 mm. (=¼ inch very nearly), giving a total length of 132 mm. (practically 5½ inches). Taking 72 mm. (=2·84 inches) as the distance between homologous points in the foreground, this distance is greater than 36+6=69 (=2·71 inches), the distance between corresponding edges of the mask. The latter will therefore stand boldly out, which it would not do if a smaller separation than 69 mm. were taken between homologous points in each print. The height of the prints does not enter into these calculations, being regulated merely by the conventional proportions of commercial stereoscopes. As a general rule, a height of 70 to 80 mm. (=2·76 to 3·15 inches) is the best. It is, of course, absolutely essential that homologous points shall occupy practically the same vertical position in each view.

Stereoscopic relief is generally attributed to binocular vision; but, if a stereoscopic print is viewed in the stereoscope first with both eyes and then with only one, it is at once perceived that the difference is slight. With the exception of the foreground, the relief in which is much less apparent in the case of monocular examination, the image produces the same impression as when viewed with both eyes. It may be concluded—and this advice is very frequently given by authors of stereoscopic manuals—that in order to obtain stereoscopic prints showing good relief, it is necessary to select subjects possessing striking foregrounds, such as interiors, caverns, gorges, &c., distant landscapes being outside the scope of the stereo photographer.

The use of the stereoscopic relief in the foreground is to give the effect of relief to the rest of the image; it gives rise to the same effect produced in dioramas, the first planes of which are the only ones separate and real, and are skilfully combined with a background painted on canvas. Yet in the diorama the appearance of solidity is as apparent as in nature, and this despite the fact that binocular vision plays no further part in it than it does in the observation of a painting. The perspective of a picture can be appreciated much better with one eye than with two, for in this instance binocular vision, by revealing the flatness of the canvas, helps to destroy the effect aimed at by the painter, whilst the single eye permits itself to be deceived by the illusion of good perspective.

If, therefore, we discern natural objects in relief, it is because of an unconscious education of our eye; and this sensation depends exclusively on perspective—on geometrical perspective as much as on aerial perspective. Binocular vision comes into play only in the case of objects near at hand emphasising the idea of the space between them in a manner impossible to the most successful perspective. If we have the sensation of relief at distances beyond about thirty to forty yards, it is because our eyes have been specially educated, and we experience the sensation of such relief quite as intensely, even when, as in the case of a painted scene placed some yards from our eyes, it is non-existent, provided that some real objects are placed before it to suggest the idea of relief. An additional proof of this is to observe a painting through a tube by which the eye is screened from the sight of all real objects. The eye is, under these conditions, easily led away by the perspective of the picture, with the result that the relief appears as great as that of the middle distance in the stereoscope, or even as that of actual objects occupying a position some distance from the eye. Distant objects cannot be seen in relief by the eye.

J. Bois.

SHORT-LENGTH SPOOLS FOR CARTRIDGE KODAKS.

In the JOURNAL for December 22 last we called attention to the fact that the Eastman Kodak Company, of Rochester, N.Y., were supplying the American photographic public with daylight cartridges for Kodak work, containing rollable film for two or six exposures, and we remarked that this departure had been made to meet the requirements of the photographer who may wish to make a few exposures without using up an entire spool of a dozen exposures before resorting to development. We then anticipated that this new convenience in film photography would in due course be placed at the disposal of European photographers. Kodak Limited now inform us that these short-length spools are available on the English market, and they send us the following particulars and prices of them.

The Company state that now and then, especially in winter, the photographer wishes to take two, or, say, half a dozen pictures, but does not

care to be obliged to use up an entire spool of a dozen exposures before development. They have, in consequence, often had requests for short spools of six exposures. In response to this demand they announce the introduction of short-length spools of daylight-changing cartridge film, of six-exposure and two-exposure capacity each.

The following is the price-list :—

	Six-exposure spool	Box of two spools	Single spool	Ordinary spool	
	s. 6.	s. d.	s. d.	s. d.	
2½ x 3½ for No. 1 F. P. K.	0	11	...	—	... 1 9
3½ x 3½ , No. 2 Bull's-eye, &c.	1	4	...	1 0	... 0 7 ... 2 6
4 x 5 , No. 4 Bull's eye, &c.	1	11	...	1 6	... 0 10 ... 3 9
(4 in. spool)					
5 x 4 , No. 4 Cartridge....	1	11	...	1 6	... 0 10 ... 3 9
(5 in. spool)					
7 x 5 , No. 5 Cartridge....	3	6	...	2 6	... 1 4 ... 6 8
(7 in. spool)					

AN OPEN LANTERN-SLIDE COMPETITION.

THE Southport Photographic Society announce a lantern-slide competition in March 1900. It is to be open to all photographers, and medals, silver and bronze, will be placed at the disposal of the Judges.

Competitors are to send in sets of six slides, for which an entrance fee of 1s. will be charged.

The following are the general regulations :—

1. No competitor shall receive more than one award.
2. All slides must be three and a quarter inches square, properly mounted and marked, and must be from negatives of original subjects, taken by the competitor. The name of the subject or title to be plainly written on the face of the slide when looked at in its correct position. Any slide not properly marked will be disqualified.
3. Sets of slides, addressed to the Hon Secretary, must be delivered free of charge at the studio, 15, Cambridge-arcade, Southport, on or before March 24, and will be returned not later than April 2, 1900.
4. Entry form and fee (1s.) to be enclosed with each set of slides.
5. All reasonable care will be taken of slides, but the Society cannot accept any responsibility for damage.

Judges (not members of the Southport Photographic Society) will be chosen by the Committee. Their adjudications shall be final.

Arrangements will be made for publicly showing the slides in Southport.

The Hon. Secretary is Mr. George Cross, 15, Cambridge-arcade, Southport.

TWO FLOURISHING PROVINCIAL PHOTOGRAPHIC SOCIETIES.

We have this week received the annual reports of two of the most important and progressive photographic societies in the country, the Liverpool Amateur Association and the Birmingham Photographic Society. From the record of the year's work of the former body we take the following extract :—

The membership roll at the beginning of the year contained 326 names; the number of new members elected during the year amounted to 40; resignations, lapses, and deaths, to 38; leaving 328 names in the books at the end of the year.

The Coffee Meetings, held on Wednesday afternoons from four to five, still prove an attraction to a number of members who are inclined for a social chat.

The special feature of the year has been the completion of the new enlarging room, at a cost of about 60*l.*, the greater portion of which was defrayed by voluntary subscriptions from members. The room has been fitted up with all the latest appliances for enlarging on paper, or for making enlarged negatives by artificial light. The source of light is incandescent gas, and the lantern, by Ross, has a ten-inch condenser and the latest stigmatic lens. Altogether it is perhaps one of the finest lanterns ever made for enlarging purposes. Subject to certain necessary by-laws regulating its use, the enlarging room is at the disposal of members free. For those who still prefer to use daylight the old enlarging camera is available as before.

Upon such evidence of prosperity we heartily congratulate the old and historic Liverpool Association.

In like manner we felicitate the Birmingham Society on a year's splendid photographic work, to which the following few extracts from its voluminous report bear testimony :—

The Fourth Annual *Conversazione* was held at the Grosvenor Rooms on January 31, when 148 members and friends spent an enjoyable evening. Mr. Gregory's band again contributed the musical programme, and Mr. C. J. Fowler acted as M.C.

It is with regret that your Council records the retirement of Sir J. Benjamin Stone, M.P., from the office of President, which he held for nine years. During this long period the Society has considerably developed its resources and materially increased its reputation under the potential influence of Sir Benjamin, and every member will cordially join

in expressing hearty appreciation and thanks for his honourable association with the office.

Professor F. J. Allen, M.A., M.D., fulfilled the office of President for the greater portion of the year, but, as he left Birmingham in the autumn, it will be necessary to appoint a successor.

Mr. J. T. Middlemore, M.P., has kindly consented to act in this capacity for the ensuing year.

The list of members has been increased by thirty, thus equalling the accessions of last year, which were the most numerous recorded.

The financial position of the Society continues to be thoroughly sound. The revenue is sufficient to meet current expenditure, and, in addition to the purchase of necessary lantern appliances, drapery, &c., the profits from the Exhibition and *Conversazione* enable further increase to be made to the reserve fund.

Inquiry is frequently made as to the object in creating a large reserve fund. Your Council recognises the desirability of making provision for adverse emergencies, and is also of opinion that, amongst other objects, a portion of the amount may be serviceable for furnishing rooms when suitable premises for the requirements of the Society may be procured.

The Annual Exhibition was, by kind permission of the Royal Society of Artists, again held in their admirable Galleries in New-street.

The pronounced success of the previous Exhibition in these rooms induced your Council to make strong endeavours to still further improve the general character and to raise the standard to the highest excellence upon this occasion.

A scheme of decorative drapery for the whole of the rooms was taken in hand by a sub-Committee, who provided a subdued background of pale green, relieved by darker shades, the colours being reversed in other rooms.

For the first time all pictures sent in were subjected to the approval of a Selecting Committee, and the severity of the ordeal is indicated by the fact that over 180 prints were rejected.

While the total number of exhibits was thereby materially reduced, the quality of the work accepted was much above previous standards, and probably very few frames were hung which were undeserving of attention.

The artistic success of the experiment encourages your Council to strongly advocate the exhibition of none but high-class work.

The old order of classification was dispensed with, pictures of any subjects being accepted in the Open and Members' sections.

In addition to the competitive work, a loan collection of 113 pictures by twenty-five of the leading artistic workers was displayed, and these included the unique series produced some thirty years ago by the late O. G. Rejlander, and kindly lent by the Council of the Royal Photographic Society.

The total number of pictures exhibited was about 470, in addition to the display of professional work.

The total attendance during the Exhibition was between five and six thousand.

In June last the Curator handed over to the City Art Gallery authorities prints to the number of 385, which have been contributed to the Survey by members during the last few years. These will, as soon as sufficient space is available, be exhibited in the City Gallery for a time, and afterwards deposited with the permanent collection, which now numbers upwards of 2000, in the Reference Library.

In addition to this number the Curator received fifty-three prints, contributed by five members of the Birmingham Photographic Society, and these were entered for competition at the last Exhibition, when a silver and bronze medal and certificate of hon. mention were awarded. This is unfortunately the smallest number of prints that has been handed in for several years past, and, considering the extensive membership of the Society, a poor representation of its workers in this section. It may be as well to remind our friends that all members of the Birmingham Photographic Society may contribute prints to the Survey, the only stipulation being that such prints shall be printed in platinum, carbon, or bromide, and should preferably consist of a series of some object, or objects, in Warwickshire not already in the Survey collection. These can be handed to the Survey Curator at any time during the year, and those sent in good time for cataloguing and mounting will be entered by him in the members' names for competition at the next following Birmingham Photographic Society's Exhibition.

It is to be regretted that no meetings of the "Photographic Survey of Warwickshire" have been held for the last eighteen months, and therefore your representatives upon that body have had no opportunity of advancing its cause.

The journey to London for the inspection of the Autumn Photographic Exhibitions, &c., was again included, and may now be regarded as an annual event.

THE CAMERA CLUB.

THE January number of the *Club Journal* states that it has been decided that for the future the *Journal* shall be conducted by a small committee. The gentlemen who have been elected members of the Editorial Committee are Messrs. Charles A. Cooper, Basil E. Lawrence, Henry H. P. Powles, and Horace Wilmer. By special arrangement with the Central

News, Limited, a column printing machine has been placed in the Club House, and is now in working order. It is intended to continue the house dinners during the present year. The next dinner arranged is a cycling dinner, of which due notice will be given. A member, Mr. F. M. Elliot, of Singapore, will be happy to receive any members of the Camera Club who may visit the Straits Settlements, and will place a dark room at their disposal.

To the same number Mr. Andrew Pringle contributes a memoir of the late W. K. Burton, in the course of which he says: "He and I spent many days together in my laboratory working out photographic problems, for these were the vastly interesting days of the earliest gelatine emulsion experiments. I also collaborated with him in writing a very long and exhaustive book on photography, theoretical and practical, a book which, by the way, I had to boil down to about one-eighth of its original size. He was one of the most acute observers I have ever known; no phenomenon, however apparently insignificant, escaped his notice, and he never rested till he had at least made a vigorous attempt to account for it. As an example I shall never forget the time when he noticed that certain plates, though extremely sensitive, had an emulsion almost ruby colour by transmitted light; we puzzled and worked over this for a long time before he, not I, discovered the reason, which I now know to have been the true one. Probably this faculty of observation was the key to his eminence as a scientific observer, for beyond doubt he was one of our best writers and experimenters. I have been told that he was no less a man of mark in his own professional line. He was one of the founders of the Camera Club, and took the greatest interest in its career in the good old one-horse days of Bedford-street. It will be long before we find another 'W. K. B.'"

Other contents of the number, which is a very interesting one, are papers on "Some principles of Development," by Mr. Alfred Watkins; "Continental Romanesque and Gothic Architecture," by Mr. Middleton, and "Illusion and Anomalies of Vision," by Mr. Shelford Bidwell.

THE GLOUCESTER CONVENTION AND THE GLOUCESTERSHIRE PHOTOGRAPHIC SOCIETY.

PRESENTATION TO THE LOCAL HON. SECRETARY.

On Monday evening, January 15, after the usual business in connexion with the election of officials for 1900, the retiring President (Mr. Medland) said that one of the last duties of his official year was a very pleasing one, viz., to hand Mr. Dugdale a cheque which had been subscribed for by the local members in acknowledgment of the very efficient manner in which he had discharged the duties of local Hon. Secretary to the Convention. He had heard on all sides that the arrangements made were excellent, and the members of the Convention who attended the Gloucester meeting were more than satisfied.

Mr. Dugdale, in replying, said that, when he undertook the duties, he did not look for any reward, and was pleased to find that his services met with such a handsome recognition. He had received the greatest assistance from the local Committee, and the success of the meeting was entirely due to them. He need hardly say that the cheque should be put to a good use: in purchasing photographic apparatus.

The new officials appointed for 1900 were:—President, Dr. John Campbell; Vice-President, Mr. S. Jones; Secretary, Mr. E. A. Ind; Treasurer, Mr. John Tibbets; Committee, Dr. Oscar Clarke, Messrs. R. W. Dugdale, and H. Medland; Hon. Lanternist, Mr. A. Pitcher.

News and Notes.

WE are sorry to learn that Mr. Alfred Seaman, of Chesterfield, has been ill with influenza. He has now recovered, and is able to attend to business.

WE also regret to hear of the death of Mr. Mitchell, photographer, of Brighton, who carried on business in the town under the style of "Mora."

THE Hon. Secretary of the Hove Camera Club asks us to state that the medals awarded at the Exhibition in December last have been posted to the successful competitors.

LIEUTENANT ALISTAIR VALENTINE, of the firm of Messrs. Valentine & Sons, Dundee, will be in command of the first battalion of Dundee Volunteers, shortly proceeding to South Africa.

THE SOUTHSEA EXHIBITION.—The Hon. Secretary asks us to state that the 22nd inst. is the latest date for receiving entries for the Twelfth Annual Exhibition of the Southsea Amateur Photographic Society.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, January 23, at 66, Russell-square, at eight p.m. "Note on Dr. Vogel's Method of Preparing Subhaloid Salts of Silver," by Major-General J. Waterhouse, I.S.C.

THE Bay State Photo Company, Lymm, inform us that their monthly developing competition for one guinea has been awarded to Mr. J. Massey, Ruthin-street, Pendleton, for a bromide print developed with their developer.

MR. H. H. H. CAMERON devoted the whole of the proceedings of last Monday evening's performance of *The Snow Man* at the Lyceum to the War Fund. The Lyceum was the first theatre to announce a children's entertainment on behalf of the fund.

MESSRS. FUERST BROS.' latest cinematograph films, taken at Southampton on Saturday last, the 13th inst., are as follows: Arrival of the Lord Mayor, in state, on board s.s. *Briton*; Embarkation of the City of London Volunteers on board the Union Liner *Briton*.

THREATENED STRIKE OF BELGIAN GLASS-WORKERS.—A Brussels correspondent states that an extensive strike is threatened among the glass-workers in the district of Charleroi. The dispute turns on the question of wages and the employment of non-union men.

PHOTOGRAPHIC CLUB.—Wednesday evening, January 24, at eight o'clock, Annual Ladies' Night. Tickets will be forwarded to each member, and any remaining will be distributed to those members requiring them. Early application is requested, as the supply is limited.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next, the 25th inst., there will be a demonstration of the "Biokam Animated Photography," by Mr. Walter D. Welford. Amongst other films those taken at the Belgian excursion will be shown, and members of the Belgian party and other visitors will be welcomed at the White Swan, Tudor-street, E.C.

ACCORDING to the Paris correspondent of a contemporary, Englishmen resident in Paris have been chaffed and jibed at since the war broke out, and they have seen the British uniform hissed and howled at when it was reproduced on the films of the cinematograph, where poor "Tommy," hearing nothing and seeing nothing, could not throw off his belt and jacket and shout, "Arr a mo" to his insulters.

THE "SPHERE."—Mr. Clement Shorter has been for some months preparing for his new paper. Such well-known black-and-white artists as Mr. Prater, Mr. Woollen, and Mr. Schonberg have been sketching in advance in South Africa for the first number, which will make its appearance at the end of this month. Lord Rosslyn has lately been commissioned to use his camera at the seat of war in the interests of the *Sphere*.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.—There will be a meeting of the Council at Anderton's Hotel, Fleet-street, London, E.C., on Thursday, January 25, 1900, at six o'clock. The following is the agenda: To discuss the proposed arrangements for the Newcastle Meeting; to elect three members of Council; to revise the rules in accordance with the alteration agreed to at the Gloucester Meeting; general business.

THE Photographic Club's forthcoming fixtures are as follows: January 24, Annual Ladies' Night; January 31, Paper by Mr. A. H. Wall, "Rejlander. His Life and Work"; February 7th, Lecture, "A Holiday in Norway," by Mr. H. J. Klosz; February 14, Members' Open Night; February 21, Exhibition of Prints and Slides of "The Belgian Photographic Excursion, 1899," arranged by Messrs. W. D. Welford and W. F. Slater.

REDHILL AND DISTRICT CAMERA CLUB.—A lantern exhibition and lecture on "Round about the Matterhorn and Aletsch Glacier" will be given in aid of the scientific apparatus fund of the Club by Mr. Henry Speyer at the small assembly room, Market Hall, on Wednesday, January 24. The lantern will be operated by Mr. William Brooks (late of the Crystal Palace). The chair will be taken at eight o'clock by the Mayor of Reigate (Mr. F. E. Barnes. J.P., C.C.).

THE South London Photographic Society will hold their Eleventh Annual Exhibition at the Camberwell Public Baths as hitherto. It will be opened on March 3 and continued to March 10. Messrs. R. Child Bayley, F.R.P.S., Thomas Bedding, F.R.P.S., and E. J. Wall, F.R.P.S., have consented to act as Judges. Full particulars and entry forms can be obtained from the Hon. Secretary, Mr. F. Goddard, Woodlands, Vanbrugh Hill, Blackheath.

THE TWENTIETH CENTURY PHOTOGRAPHIC EXHIBITION, BIRMINGHAM.—Mr. Walter D. Welford points out that in Class K, "Negative working up," it is not intended that professional photographers should be debarred. Both employees of professional photographers and the photographers themselves are eligible, and are invited to compete. The test negatives are now ready, and may be obtained, along with conditions, from 19, Southampton-buildings, Chancery-lane, London, W.C., price 2s. 6d. each, post free.

A COMPETITOR for a prize offered by a contemporary for some verses about the century makes the following monstrously diverting reference to photography "in the brave days of old":—

"You could not buy a photo then of girls like Edna May,
For Daguerreotypes were negatives, plain English did not pay,
And Slater's female Sherlocks did not snap-shot night and day,
When this old grey-headed century was young."

PHOTOGRAPHS IN A DIVORCE CASE.—In the course of a recent divorce action it transpired that, after he had commenced his suit, the petitioner received a parcel of photographs from the co-respondent, upon each of which there were words in the co-respondent's handwriting. One, entitled "The Welcome," represented the co-respondent and respondent shaking hands; a second, called "A Good-bye," showed the co-respondent on horseback, and the lady saying good-bye; a third, entitled "A Call Back," pictured the co-respondent on horseback, with the lady standing by his side, both looking towards the house; while a fourth, beneath which was the word "Yes," represented the gentleman proposing to the lady, whose answer evidently was "Yes."

THE AUSTIN-EDWARDS MONTHLY COMPETITION.—The following is the list of awards in the Austin-Edwards lantern-slide and film-negative competition for the current month: 3*l.* cash prize, Mr. M. Harding, Shrewsbury, *Statue of Artemis, Eaton Hall*; 2*l.* cash prize, Mr. J. Browning, Lowestoft, *Evening on Oulton Broad*; 1*l.* cash prizes, Mr. G. Bird, Bath, *Happy Childhood*; Dr. P. Sharp, Newark, *Dew-drops on Spider's Webb*; Mr. E. R. Bull, Forest Hill, *The Crypt, Wells Cathedral*; Mr. W. H. Tomkinson, Liverpool, *Frost Scene*; Mr. H. O. Isaac, Bristol, *Sunset on River Avon*. The Frena camera, given each month for the best negative on an Austin-Edwards film, has been secured by Mr. W. M. Dodson, Bettws-y-Coed, for his negative, *South Aisle, Ely Cathedral*.

THE following are some of the Warwick Trading Company's new war films of the Modder River engagement, photographed by Mr. Bennett Stanford of the Company's staff, now with General Gatacre's column in South Africa: Lancers under the Earl of Airlie fording the Modder River on their return from the Emslie engagement, December 8, 1899; The Hospital Corps attending the wounded on the battlefield after the Modder River engagement; Troop train carrying the Seaforth Highlanders over the Modder River, crossing on a temporary bridge erected in place of one blown up by the Boers, showing hundreds of troops riding in open coal trucks, both ends of the train being guarded by an armoured car and engine; The ("Fighting Fifth") Northumbrian Fusiliers making trenches at Orange River, South Africa. The passing of an armoured train.

THEFT BY AN EMPLOYÉ.—James Dalgety, twenty-seven, a warehouseman, of Leighton-road, Kentish Town, was charged at the Clerkenwell Police Court, with stealing from 43, Clerkenwell-road, a Kodak camera, value 3*l.*, the property of George Davison and others, of 43, Clerkenwell-road. The prisoner was further charged with stealing during the past six months a quantity of photographic goods, value 2*l.*, the property of the same prosecutor. Prisoner entered the service of the prosecutor as storekeeper in July 1898, and was discharged in October last. He subsequently offered for sale at premises in Cheapside the Kodak mentioned in the charge. Other property mentioned found in his possession was also identified by the prosecutor. Detective-Sergeant Urben proved arresting the prisoner at Aden-grove, Stoke Newington. At the prisoner's address the officer found some of the stolen property. He also found in Dalgety's possession a number of pawn tickets. Mr. Brics remanded the prisoner.

BOOKS FOR THE SALVATION ARMY.—We have received the following letter from the City Colony Headquarters of the Salvation Army, 20 and 22, Whitechapel-road:—"Commissioner Cadman desires me to bring before your notice an effort we are making to provide small libraries for some of our Homes, and, considering the philanthropic object in view, it has occurred to him that probably you may have some waste or soiled copies of different books which you might feel led to donate for the purpose. Perhaps we should explain that the institutions referred to are those for the men for whom we daily find employment in our workshops and who stay in our Homes at night. You will readily see that something to read will go a long way to beguile the evening hours, and act as a strong counter attraction to the public-house outside. We are not particular for the reading matter to be of a religious strain, but anything which is interesting and at the same time elevating and instructive will be acceptable." Perhaps some of our readers may have books to spare for this deserving purpose.

SUDDEN DEATH OF A BOLTON PHOTOGRAPHER.—Mr. Peter Greshalgh, photographer, of Market-street, Farnworth, and Bridge-street, Bolton, died very suddenly about eight o'clock on Thursday Jan. 11 while in his bathroom. The deceased was sixty-eight years of age, and was a native of Walshaw. He had carried on the business of a photographer and stationer, at Farnworth for more than thirty years, he and the late Mr. Kay being the first to follow the profession in the district. Although not occupying any public office, he always took the greatest interest in Farnworth affairs. He was one of the founders of the Moses Gate Wesleyan Church, leaving Holland School with other friends to labour in that locality, and in connexion with the school he has been a class leader, trustee, superintendent, and for very many years teacher of the first male class. He was very greatly interested in the temperance work, and was the Vice-President of the Farnworth P.S.A. Some time ago he was troubled with a serious heart affection, and for six or eight months he had suffered very acute attacks, although he has not been confined to bed for a long period. He was busy photographing on Wednesday.

IN the course of a recent lecture at the London Institution, Dr. A. H. Fison referred to the phenomenon of the persistence of vision, explaining why the image of an object formed on the retina did not immediately disappear when the object was removed from the sight, but gradually faded away until, in about one-quarter of a second, it had completely vanished. It was for this reason, he said, that the eye could not follow very quick motions, and that a red-hot poker swung round rapidly gave the impression of a circle of fire. After illustrating this persistence of vision with several experiments, the lecturer said it was the basis of a method of mixing colours—that known as Newton's whirling disc—which he proceeded to describe. If a disc, painted in stripes with the colours of the spectrum, were rapidly rotated, no single colour was distinguishable to the eye, but the mixture of all the colours gave the sensation of white. Dr. Fison showed several examples of this mixing, and pointed out that a given tint could be matched by several different combinations of colours, though the matching might not be correct in every light. The general law of colour mixture was next set forth, and it was explained that every colour in nature could be produced by the combination of red, green, and violet, which, on that account, were termed the primary colours.

THE Clifton Cabinet Competition at the National Trades Exhibition resulted in the gold medal diploma being awarded to Mr. Muirhead, photographer, Albany Chambers, Charing Cross, Glasgow, for a cabinet photograph of Bothwell Castle on the Clifton sensitised paper.

WE understand that Mr. Arthur Rayment, late of the firm of Messrs. Perkin, Son, & Rayment, 99, Hatton garden, E.C., will in future devote himself to the business of wholesale agent in photographic and optical goods. Mr. Rayment's wide and intimate knowledge of the business should stand him in good stead, and we are sure that he will carry with him general good wishes for his success.

WE are sorry to hear of the death, in London, recently, of Mr. D. H. Hogg, the well-known dealer, of Montreal, Canada, the result of an accident on board *ss. Majestic*, en route a business trip to Europe. We are informed that the business will be conducted on behalf of Mrs. Hogg, and that the many customers and friends of the late Mr. Hogg will be accorded the same treatment as during his useful and thoughtful life.

MESSRS. PERKEN, SON, & CO., of 99, Hatton-garden, E.C., notify us that the partnership that has subsisted for some years between them and Mr. Arthur Rayment (under the style of Perken, Son, & Rayment) was determined by effluxion of time on the 31st ult. Messrs. Edgar T. Perken and F. L. Perken will continue to carry on business at the above address under the style of Perken, Son, & Co., and, by arrangement with Mr. Rayment, will receive accounts due to and discharge all liabilities of the former partnership. We wish the well-known and respected Optimus house continued success. The business, which dates back some forty years, was formerly known as Lejeune & Perken, and is one of the oldest and most esteemed in the photographic trade.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
22.....	Bradford Photo. Society	Secco Film Company's Demonstration.
22.....	Camera Club	{A Year and a Half's Experience with a Benz Motor Car. J. H. Knight.
22.....	Kingston-on-Thames	Defects and their Remedies. E. Dockree.
23.....	Birmingham Photo. Society	The Western Shores of the Emerald Isle. Miss E. M. Finey.
23.....	Bootle	Lecture: With the South London Photographic Society in Belgium.
23.....	Camera Club	Club House Dinner.
23.....	Hackney	{Some Recent Developments in Photography. R. Child Bayley.
23.....	Leeds Photo. Society	Conversazione and Exhibition of Members' Work.
23.....	Royal Photographic Society	Note on Dr. Vogel's Method of Preparing Subhaloid Salts of Silver. Major-General J. Waterhouse, I.S.C.
24.....	Ashton-under-Lyne	Demonstration: Platinotype Printing and Developing. Dr. Hamilton.
24.....	Borough Polytechnic	Lantern Night.
24.....	Croydon Camera Club	Tele-photography. Ernest Marriage.
24.....	Photographic Club	Annual Ladies' Night.
24.....	Redhill and District	{Round about the Matterhorn and Aletschi Glacier. Henry Speyer.
24.....	Southport	Exposure. Alfred Watkins.
25.....	Camera Club	The Massai. Captain Hinde.
25.....	Leigh	{The Eye versus the Camera. Joseph Jones, M.B., Ch.B.
25.....	Liverpool Amateur	Evening Exhibition of Competition Prints.
25.....	London and Provincial	Demonstration: Biokam Animated Photography. Walter D. Weiford.
25.....	Oldham	{Plates and Papers for Pictorial Work. Reader, J. Wrigley.
26.....	Ashton-under-Lyne	Elementary Photography Class.
26.....	Borough Polytechnic	Practical Evening: Development.
26.....	Bristol and West of England	Marine Photography. H. A. Hood Daniel.
26.....	Croydon Microscopical	{Demonstration: Cristoid Film. J. H. Baldock, F.C.S.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 16.—Photo-mechanical Meeting.—Mr. W. B. Ferguson, Q.C., in the chair.

PHOTOGRAVURE IN COLOURS.

MR. IGNATZ HERBST showed several examples—some of them very large—of photogravure printing in colours. He said they were produced in England, and at one operation. They were examined with much interest and were greatly admired, and, as considerable curiosity was evinced as to the method employed, Mr. Herbst kindly undertook to read a paper upon the subject at a future meeting.

SCREEN GEARS FOR HALF-TONE.

MR. W. GAMBLE read a paper on "Screen Gears for Half-tone," starting by defining a screen gear as any mechanism for adjusting the distance of the ruled screen relative to the fixed position of the sensitive plate when working the half-tone process. Such a screen gear might be contained in the body of the camera or in the dark slide, but the term was more generally applied to a gear contained in the rear of the camera body. It had been found that to obtain dots of a proper size on the negative there existed a definite proportion between the distance of the lens from the plate and that of the screen from the plate, and that this proportion also bore a fixed ratio to the size of the diaphragm opening and the size of the screen opening. If, therefore, it was

Commercial Intelligence.

MESSRS. ROSS, LIMITED, of 111, New Bond-street, W., and Cockspur-street, Charing Cross, are opening a branch of their business at Paris.

THE interesting process of colour photography known as the Kromaz will, we understand, shortly be brought prominently to the notice of the public by a syndicate now in process of formation for that purpose.

FOR a considerable time past there have been rumours as to a projected combination of English plate and paper-makers. We have the highest authority for stating that such a combination is not now likely to take place.

necessary to change the camera extension to suit different sizes of copies, to change the stops to govern exposures, and to change the screen to suit the demand for varying degrees of fineness in the ruling, it was obvious that the screen distance must also be shifted, and the object of a screen gear was to mechanically vary the distance to any desired extent. The genesis of modern half-tone was dated from 1893, and in that year Mr. Gamble's firm made the first screen gear, which included also a means of rotating a single-line screen for the purpose of securing a crossing of the lines during exposure. The paper then proceeded to describe the various stages of progress in the construction and improvement of the apparatus, and the modifications which had been made on the original idea. The author thought that the present tendency was to put more and more metal into screen gear cameras, and to make them unnecessarily complicated; but he expressed a fear that makers might go too far in the direction of making the camera a masterpiece of mechanical engineering. He showed an American screen gear which possessed a bewildering multiplicity of attachments, and which was said to be capable of everything but talking. In his opinion, all improvements in mechanism of this kind should be in the direction of greater simplicity. Every part likely to go wrong should be improved; every detail should be made so definite in direction that the operator could not possibly turn it the wrong way—in fact, every effort should be made to spare the operator from thinking, for the poor fellow had quite enough to think about to get the work out, and did not want to lose an exposure by forgetting to turn some knob or screw. The best way of setting screen distance was stated as follows: Insert the screen, pin up the copy, and focus it sharply, and of proper size; insert a suitable square stop of medium size proportional to the camera extension, putting it in the lens with its sides parallel to the sides of the camera; then take a powerful focussing eyepiece, and apply it to the clear space of the ground glass; move the screen up, and the dot effect will gradually become sharper, the dots having much the appearance that they take on the negative, but less dense and precise. The correct position is, as nearly as possible, at that point where there is a chess-board effect, the corners of the dots being distinctly square. When this effect has been secured, look again more closely, trying to see white squares, and try to shift the screen so that these white squares just touch at the corners.

Messrs. BOLAS and LAMBERT and the CHAIRMAN spoke in eulogistic terms of the value and lucidity of Mr. Gamble's paper, but there was no discussion, the members present proceeding to inspect the apparatus, comprising the most approved system of screen gear, which he had brought for exhibition.

COMING EVENTS.

January 23, Technical Meeting, "A Note on Dr. Otto Vogel's Method of Preparing Sub-haloid Salts of Silver," by Major-General Waterhouse, I.S.C. February 6, Lantern Meeting, "Shakespeare at Home," by Mrs. Catherine Weed Ward. February 13, Annual General Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 11.—Mr. E. T. Wright in the chair.

The question of the effect of backing upon the speed of a plate was again brought up.

Mr. R. BECKETT understood the argument to turn upon the point whether or no the backing, by absorbing light which would otherwise be reflected again into the film, reduced the amount of light action upon the plate to that extent. It was, he took it, a question of exposure, and not of actual speed of emulsion.

Mr. PHILIP EVERITT suggested that it might be that the speed of the emulsion was affected. As an example, he said, suppose one backed a plate with aurantium dissolved in collodion. The surface of the gelatine was immediately bedewed with moisture from the atmosphere, caused by the chilling influence upon the glass plate of the evaporating solvent, and some little time elapses before the film regains its former dryness. He was assuming that the plate was coated with emulsion before the backing was applied, although he did not assert that this was done commercially. Would the partial damping of the emulsion surface involved in the operation described and the following drying process affect the speed of the plate? It is not altogether a question of the difference of speed between a wetted and a dry plate, but as between a dry plate and one wetted and dried.

Mr. A. HADDON said a friend who had tried the experiment found that a plate was slower before it was dried than when dry, the difference being two numbers on Warner's sensitometer.

Mr. S. H. FRY considered that an emulsion was generally ripened up to its reasonable maximum before coating, and that consequently there should not be much difference between its speed wet and dry.

Mr. EVERITT said that it had been asserted by Mr. Wellington that the fact that an emulsion had set and been melted again increased its sensitiveness.

Mr. BECKETT stated the position respecting backing was this: Backing renders a plate capable of taking more exposure than it would if unbacked. There was, as a consequence, less danger of over-exposing, and a far more correct rendering was also given.

Mr. FRY said that the better rendering was given only if the exposure had been enough. A short exposure on a backed plate tended to give hardness, on account of the elimination of fog by the backing medium.

It was hoped that members would make some experiments to determine whether there was a difference in sensitiveness in consequence of wetting a plate, and the following tests were suggested: to dip half of a plate in water and then expose; and, secondly, to dry the plate before exposure.

PHOTOGRAPHIC CLUB.

JANUARY 10.—Mr. Hans Müller in the chair.

Mr. CHARLES R. ROWE gave an interesting lecture on

FAIR DEVON,

illustrated by many lantern-slide pictures taken within the county. The

United Devon Association, which he represented, was one whose aim was to smooth the paths of the tourist, and it was with a hope that he might influence many who journeyed annually to the Continent for their recreation to turn their backs thereon this season, and come to their delightful county of Devon. The views included all the principal places of note—Exeter, Teignmouth, Dartmouth, Plymouth, and neighbourhood, and others on the north coast and interior.

A vote of thanks was passed to Mr. Rowe.

Hackney Photographic Society.—January 9, the President (Mr. W. Fenton-Jones) in the chair. The feature of the evening was a demonstration of the

SANDELL CRISTOID FILM,

by Mr. J. T. SANDELL. Mr. Sandell claimed for the film all the good points of the well-known multiple-film plates, with many additional advantages. Any developer might be used, but one of pyrocatechin was recommended. In warm weather a preliminary bath of formalin was necessary. As the solutions acted on both sides of the films at once instead of on one side only, as in the case of the glass plates, the operations of developing, fixing, and washing were shortened, the average time for development being about six minutes, and that of washing after fixing not more than half an hour. After washing, the films would be found to have increased in size about twenty-five per cent., but this enlargement might be reduced if desired by immersion in methylated spirit before drying. To dry the films they must be squeegeed upon glass or ferrotype plates, stood in a cool place, and allowed to dry naturally. Mr. Sandell developed at the meeting four films at the same time in one dish, giving each the same amount of developing, although the respective exposures had varied greatly, being, in fact, one second, fifteen seconds, fifty seconds, and five minutes. The one-second exposure seemed by the results to have been the correct one; but, although the last two negatives were much too dense, they were made good printing negatives by reducing in a ferricyanide bath. A large number of negatives, prints, and lantern slides were shown to illustrate the capabilities of the Sandell multiple-coated plates and films.

North Middlesex Photographic Society.—January 8.—At the Annual General Meeting of the above Society Mr. Mummery, to the great regret of all the members, announced that circumstances compelled him to relinquish the post of President, which he had held for the past four years. He read his annual report, which showed that the Society was as vigorous and in as good a position as ever it had been. The election of officers for the current year took place, and resulted as follows:—President: Mr. R. Child Bayley, F.R.P.S.—Vice-Presidents: Messrs. H. W. Bennett, F.R.P.S., and F. W. Cox.—Council: Messrs. J. J. Armitage, S. Barnard, S. H. Fry, F.R.P.S., E. W. Hickox, A. G. Lawson, J. W. Marchant, F.R.P.S., J. O. S. Mummery, F. L. Pither, R. R. Rawkins, C. R. Steele, and W. Taylor.—Librarian: Mr. F. A. Haylett.—Treasurer: Mr. H. Smith.—Secretary: Mr. H. Stuart, 40, Lambton-road, Hornsey-road, N.—Assistant-Secretary and Curator: Mr. T. Pring. Mr. Child Bayley, on his election, said he would try and follow in the footsteps of his predecessor. He recognised that it was no easy task before him, but would do his best, and asked for the hearty co-operation of the members. He would like, if it was in order, to propose a hearty vote of thanks on behalf of the Society to Mr. Mummery for his untiring efforts for its welfare. This was seconded by Mr. Marchant, and carried unanimously.

West London Photographic Society.—January 5.—Mr. J. BROWN (Hon. Secretary), gave a practical demonstration of the

CARBON PROCESS BY SINGLE TRANSFER.

He commended the process for its ease and cheapness, and for the wide choice of colour and surface which it afforded. Using a smooth thin paper for the support presented no difficulty, but, in the case of the thick and rough papers, certain precautions were necessary in order to obtain thorough adhesion between tissue and support. He always soaked such papers for fully half an hour after having first squeegeed them vigorously, under water, to a glass plate or to the bottom of the dish, and in some cases it was desirable that they should be soaked in warm water. By these means air bubbles were removed, and the paper thoroughly permeated with the water. With such papers the tissue required more vigorous squeegeeing, and they should be kept under pressure for thirty minutes or longer. In very warm weather there was a risk of reticulation taking place in development, and as a preventive it was advisable to cool the sensitising bath and the water in which the tissue was to be soaked. It was usually regarded as a drawback to the process that development must take place the same day as the exposure on account of the well-known continuing action of light, but this could be overcome by either keeping the exposed tissue in a calcium tube or by thoroughly washing out the bichromate after exposure. Burton's actinometer was recommended as the simplest form. A number of very fine prints, showing the various colours in which the tissue is prepared, were kindly lent by the Autotype Company, and much admired by the members present.

Leicester and Leicestershire Photographic Society.—The Annual Meeting was held on Wednesday, January 10. Mr. J. Toone was elected President for the year, and Mr. W. Murray, 185, Melton-road, Leicester, Hon. Secretary.

Liverpool Amateur Photographic Association.—January 10, Mr. Paul Lange (President) occupied the chair.—Mr. F. W. SAXBY gave a demonstration on

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS WITH AN ORDINARY CAMERA. Mr. Saxby dealt with his subject in a very able manner, and lucidly explained how, by the aid of improvised apparatus, such as might be possessed by any photographer, objects on microscopic slides could be photographed in enlarged dimensions. A number of beautiful slides, taken by himself, were passed through the lantern in illustration of the demonstration, and were greatly admired by those present.

Edinburgh Photographic Society.—January 10, Mr. James Hay (Vice-President) in the chair.—A lecture was delivered by Mr. F. P. MOFFAT on

PORTRAITURE AT HOME.

The lecturer said that the branch of photography which he had taken for his subject was not an easy one; in fact, it was perhaps one of the most difficult; but, at the same time, it was also one of the most fascinating. When taking photographs in an ordinary room, he thought photographers should avoid aiming at the production of what he might call studio photography, or the head-and-shoulders style, of which millions were being turned out yearly. He was not running down that style, which was perhaps the most popular of all, but he thought it was quite impossible to get any but second-rate results in a room where there were no appliances for the regulation of light and shade. Speaking of what he characterised as the most important element in home photography—lighting—he said that they must always remember that the light should come from one direction only. After giving a number of valuable hints, the lecturer discussed the question of backgrounds. He did not recommend artificial backgrounds, except for bust photographs. With regard to lens, he said the most suitable and convenient was a good rectilinear landscape lens, not too short in the focus. In conclusion, Mr. Moffat spoke against photographers striving to get what he might term professional attitudes. Let them take their friends in their own natural positions, with their usual expressions. The more unlike a photograph was to the ordinary run of photography, the better chance they would have of pleasing, as there would be less chance of unfavourable comparison. The lecture, which was illustrated by limelight views, was closely followed throughout by a large audience. After the lecture the presentation print for 1900 was distributed to the members. It is from the negative by Mr. J. B. Johnston, entitled, *In Largs Bay*, which secured in 1898 the Society's silver medal, being the highest award for landscape work.

FORTHCOMING EXHIBITIONS.

1900.

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| January | Huddersfield (Invitation). W. A. Beevers. Cloth Hall-street, Huddersfield. |
| " 29-31..... | Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea. |
| February 10-24 | Edinburgh Photographic Society. J. S. McCulloch, 10a, George-street, Edinburgh. |
| " 24-March 3 | Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley. |
| March | South London Photographic Society. |
| " 26 | Twentieth Century International, Birmingham. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C. |
| " 26-31 | Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin. |
| April 3-7 | Birkenhead International. C. F. Inston, 25, South John-street, Liverpool. |

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

The following applications for Patents were made between January 1 and January 6, 1900:—

PLATE-CHANGING APPARATUS.—No. 12. "Improvements in Photographic Apparatus and in the Method of Changing Plates or Films in Photographic Cameras also applicable to Colour Photography." C. G. WARNECKE and W. H. HEATH.

PLATE-HOLDERS.—No. 17. "Improvements in Envelopes and Holders for Sensitive Photographic Plates." P. WALLIS and E. F. WALLIS.

CAMERAS.—No. 218. "Improvements in and relating to Photographic Cameras." Complete specification. J. A. PAUTASSO.

HALF-TONE SCREENS.—No. 249. "An Improved Method of Making Screens or Light Subdividers for Use in Making Process Blocks." E. SPITZER.

EXPOSING APPARATUS.—No. 294. "An Improvement in Apparatus for Taking a Number of Photographs on One Plate and at One Exposure." T. BROWN.

PHOTOGRAPHY ON COPPER.—No. 301. "A Method of Producing a Permanent Likeness on Copper or other known Metals or Alloys by the Aid of Photography for the Purposes of Decoration." W. H. BABINGTON.

CAMERAS.—No. 306. "Improvements in Photographic Cameras." I. G. SIGLER.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

THE DEVELOBOX.

To the EDITORS.

GENTLEMEN,—I read with most interest in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC (p. 867) the article concerning the apparatus of Mr. Donny, the Devolobox, for which I am the exclusive agent in the United Kingdom, so I take the liberty to point out a slight mistake.

Instead of the "cover or cloth," mentioned in your article, "placed over the upper part of the apparatus, and over the head and shoulders of the operator," we have devised a pair of special eyepieces with plush-covered openings, through which the eyes may follow the various manipulations inside the apparatus, whilst all outside light is strictly shut out. The addition of these eyepieces is a capital improvement. The Devolobox, being provided with a developing dish, in which, by means of a special leather, the plates can be perfectly protected from the light, allows the operator to move about, to leave the eyepieces or the sleeves, and even to open the door without any risk of spoiling or fogging his negatives.

Hoping you will take notice of this last improvement in the Devolobox,
—I am, yours, &c.,
O. LAMIRault.

[We insert the desired correction with pleasure, but it must be pointed out that our information was obtained from the patent specification of the invention.—EDS.]

FREAK PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I read in THE BRITISH JOURNAL OF PHOTOGRAPHY references to pictures showing subjects through others or the like. I think, until further proof, that they are double exposures. To illustrate this, I will give you the experience of a friend of mine using a Kodak. Some time ago he went to the Combat Naval, an exhibition now shown here in advance of the big 1900 Exhibition, and took a few views of same. Shortly afterwards, and before developing the three or four views taken (out of the twelve of the roll), he met with a small accident to his Kodak, and went to a dealer to have it repaired, mentioning the fact of the exposed films. By mistake the dealer or his clerk replaced the film in his drawer with a quantity of others for sale, and put an entirely new film in the Kodak. My friend is now without the views, but what will the party that bought the other film think when, upon developing, he finds a war ship across the lovely face of a dear friend, or, maybe, standing upon her head, or over a "bus," or across a landscape? No hole in the camera will ever explain this mystery to him. Some similar subject appeared some years ago in THE BRITISH JOURNAL OF PHOTOGRAPHY, and was answered, but I doubt if it ever was tried conclusively or in any satisfactory way. In the postman's case (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1900, p. 16), are you quite sure that the postman did not press the ball accidentally while partly down postman's coat, &c., and exposed door first?—I am, yours, &c.,
A. LÉVY.

Asnières, Seine, January 9, 1900.

THE PARIS EXHIBITION.

To the EDITORS.

GENTLEMEN,—I am desirous of exhibiting at the forthcoming Paris Exposition, and shall feel grateful if you could give me information on the following through your valuable paper:—

1. Where must I apply, and to whom, in France or England?
2. Do you know anything about wall space and charges?
3. What would be the most suitable subjects, portraiture or native rural scenes?

4. Large or small work, and what style of framing, all gold or otherwise, and any other suggestion that you might think useful?—I am, yours, &c.,
Easebourne-road, Midhurst, January 11, 1900.

F. COZE.

[The authorities of the Paris Exposition have apportioned very little space for British photography, and do not invite an exhibition of it. Mr. Craigie, of the Photographic Salon, and General Waterhouse, of the Royal Photographic Society, have been asked by the British Commission to organize a small collection of pictorial and technical work, and this we believe is being done by invitation. With this exception it may be taken that British photography is shut out of the Paris Exposition.—EDS.]

PHOTOGRAPHING A PRINT FROM A BOOK.

To the Editors.

GENTLEMEN,—Replying to "Amateur" in your issue of the 12th, I would recommend him to press the leaf heavily with a warm iron, placing a sheet of tin under it and thin paper over to avoid scorching or soiling, and to back up with black paper to diminish contrast, not with white, which would increase it.—I am, yours, &c., THOS. STOKOE.

Clare, Suffolk, January 12, 1900.

COLOUR PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—I have been arguing with a gentleman concerning coloured photographs. He says photographs can be taken in colours. That is, photographs are taken on the plate in colours.—I am, yours, &c., 18, Great Church-street, Wisbech, January 12, 1900. A. E. HENSON.

[The gentleman is, in effect, correct. By the Lippmann interferential process, often described in our pages, you can obtain a picture on glass in natural colours.—EDS.]

COPYRIGHT.

To the Editors.

GENTLEMEN,—Mr. Ralph W. Robinson's letter on the above subject should interest all photographers. As the matter stands, the sitter who pays for his or her photographs is supposed to have the copyright thrown in into the bargain, for the "good and valuable consideration," which the framers of the Act wrote, instead of the words "payment" or the "coin of the realm." This being so, evidently the photographer will have to buy back the copyright from his sitter. Could not this be done by stating on the price-list that the photographs are supplied at a certain rate on the express condition that the sitter, at the time of sitting, signs his or her name in a book, making over the copyright to the photographer, and that any sitter who objects to do so, or who wishes to retain the copyright of his or her portrait, will be charged twice the amount stated in the price-list?

Whether the following words would be legally binding I cannot say, perhaps you can tell me?

THE COPYRIGHT in the portrait of the undersigned is the property of John Jones, photographer, of Slocum-on-Podgis, according to the price-list issued by him, dated January 1, 1900.

Date.....

Sitter's Signature.

Date.....

Sitter's Signature.

Whether any benefit would revert to the photographer is doubtful, for the game of taking legal proceedings against infringements of copyright is not worth the candle to the photographer, for the pirates are men of straw. The photographer, and the photographer alone, has to pay all expenses, and, if the pirate is a man of property, he takes his revenge afterwards.

But the photographer, when he gets his copyright, can please himself whether he fights the pirates or not. If he is wise, he will get the Copyright Union to fight for him.—I am, yours, &c. FRANK M. SUTCLIFFE.

Whitby, Yorks, January 12, 1900.

[We have some remarks on the subject of copyright in another column. In the suppcsititious case put by Mr. Sutcliffe it is doubtful if the document would be legally binding. A properly executed assignment, registered at Stationers' Hall, might be necessary. We shall, however, be glad to hear the opinions of any of our readers on the matter.—EDS.]

PHOTOGRAPHY IN WARFARE.

To the Editors.

GENTLEMEN,—You have some informing notes relative to the above in your last issue. Since sending you a letter which appeared in a recent issue, I have learnt that several military men, and more than one war correspondent now in South Africa, are equipped with cameras fitted with the tele-photo lens. Mr. Shelley has a remarkable photograph of Lord Methuen directing operations at the Battle of Magersfontein, taken at a distance of over a quarter of a mile by the aid of the tele-photo lens, in the second number of the *King*. The photograph is a notable achievement for all concerned. The proprietors of the illustrated papers, at any rate, recognise the value of the invention. Photography as a means to effective illustration is just now being taken full advantage of. It is an interesting fact that Mr. René Bull, the special correspondent of *Black and White*, supplements his drawings by means of photographs taken by himself.

Mr. Thomas R. Dallmeyer strongly believes in the value of balloon tele-photography as an aid to successful warfare. There are some striking "telephotograms" taken in this way, in his recently published book on *Tele-photography*.

You point out that the military authorities are already fully alive to the importance of the possible uses of photography in warfare. This being the case, much that has recently been written on the subject is perhaps superfluous, as you suggest. Probably I come under your castigation.—I am, yours, &c.,

J. A. REID.

'Kincraig,' Cutcliffe Grove, Bedford, January 13, 1900.

[With regard to the last line of our correspondent's letter, it is right to say that Mr. Reid was not one of the persons referred to in "Jottings." He is obviously better informed on photographic matters than the ignorant people who write in the daily papers on the subject, and whom "Cosmos" had in mind. A paragraph in this week's *Ex Cathedra* may be of interest in connexion with the matter.—EDS.]

THE COMMERCIAL PRODUCTION OF STEREOSCOPIC PRINTS AND TRANSPARENCIES.

To the Editors.

GENTLEMEN,—I see, in "Jottings" in your last issue, a reference to making prints and transparencies from stereoscopic negatives, and quite endorse your views as to the difficulty of getting properly cut and mounted slides, many commercial ones being very faulty in this respect. As I have had twenty or thirty years' experience in this class of work and making slides on either wet or dry plates, I shall be happy to undertake any work of that class from photographers' own negatives, feeling sure that they will be satisfied with the result.—I am, yours, &c.,

E. H. ALLIS,

11 Grove-lane, Denmark Hill, S.E., January 13, 1900.

[Messrs. Seaman & Sons, of Chesterfield, and other correspondents write us to the same effect. We hope this department of trade-printing will receive increased encouragement at the hands of professionals and amateurs.—EDS.]

PHOTOGRAPHIC MASONIC LODGE.

To the Editors.

GENTLEMEN,—I should be obliged if you would kindly announce that a meeting will be held in the Masonic Temple, Anderton's Hotel, Fleet-street, E.C., on Wednesday the 24th inst, at eight p.m., to further consider the preliminary steps in connexion with the above scheme, which has already been ventilated in your columns. All those interested in the matter are invited to attend, or, if unable to do so, to write me at the address below.—I am, yours, &c.,

W. E. DUNMORE.

110, Shaftesbury avenue, London, W., January 15, 1900.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

J. A. Horsburgh, 4, West Maitland-street, Edinburgh.—Photograph of General Wauchope, in uniform, Black Watch. Photograph of the Right Hon. the Marquis of Lothian. Photograph of the Hon. James Horier, M.P. Photograph of the late Lieut.-Colonel Lownan.

W. VICK (Muswell Hill).—1. In your particular case, perhaps not worth specially troubling about; some firms are, we hear, making it known that they undertake the work. 2. We could not suggest what to charge.

BOOK ON HALF-TONE.—W. H. W. says: "Will you kindly advise me the best book I can get on half-tone negative-making and printing?"—In reply: *The Half-tone Process*, by Verfasser, published by Percy Lund & Co., Bradford.

BROKEN CONDENSER.—P. HAIGH says: "One of the glasses in my four-inch condenser is cracked right across the middle. Can you tell me of any cement with which I can repair it so that the break does not show, as I do not want to go to the expense of a new glass if I can help it?"—No, the lens cannot be repaired. The only thing is to get a fresh one. It will not cost much..

MOUNTING.—C. E. says: "Will you kindly tell me if you know of a mountant for mounting P.O.P. prints in albums without wetting them? I know it can be done, but cannot find out how. When the prints are wet, I have to wait for each to dry, which takes a long time, besides which the leaves cockle."—This subject was fully dealt with on pp. 659 and 706 of our last volume, to which our correspondent is referred.

PHOTO-LITHOGRAPHY.—GEO. BRAY says: "I have a small 'model' printing press, and I want to try my hand at photo-lithography. I find that I can, by a slight alteration, make the press to take a thin lithographic stone. Do you think, with that alteration, I could use the press to produce photo-lithographs?"—No, we do not; because, with the press mentioned, the pressure is a flat, direct one; whereas, for photo-lithography a scraping or a rolling pressure is required, as it is applied by the lithographic press.

CENTRIFUGAL SEPARATORS.—CENTRIFUGAL says: "I remember seeing a description of a centrifugal machine for making silver emulsion in THE BRITISH JOURNAL OF PHOTOGRAPHY. Will you kindly give me the following information? 1. Where can I obtain it? 2. Can I make it? 3. Is it possible to separate resin from oil by the same?"—In reply: 1. Our correspondent can obtain the machine, we believe, from Messrs. Watson, Laidlaw, & Co., Glasgow. We give the address from memory. 2. It is engineers' work. 3. We should think so, but have no data on the subject.

OXIDISING STEEL, &c.—H. P. asks: "1. How can brass and steel be oxidised? 2. Where can aluminium be bought, and how can it be chemically blackened? 3. Where can leather be bought for covering hand cameras?"—1. We scarcely understand what is meant by oxidised in this case. Is it blackened? If so, a receipt for blacking brass is given on page 972 of the ALMANAC for last year. 2. The Aluminium Co., Goswell-road. We do not know a satisfactory method of chemically blackening it. 3. At any of the dealers' in bookbinders' material.

COMMENCING BUSINESS.—PICTORIAL says: "I am about to commence business as a landscape photographer, and shall feel obliged if you will kindly reply to the following questions: 1. When supplying dealers in photographs, stationers, &c., with views, is it usual to sell them the views, or to allow commission on the sale of them? 2. What is the usual discount or (if the latter is the rule) commission allowed?"—In reply: 1. It is quite a mutual arrangement between the photographer and those he supplies. Both systems are in vogue. 2. This also is quite a matter of arrangement.

LIABILITY FOR COPYRIGHT INFRINGEMENT.—J. A. R. says: "I sent some photographs to an illustrated paper some time ago. They were reproduced, considerably enlarged. The affairs of the paper were recently in liquidation, when I was informed that there would be no prospect of any payment being received. The paper is still in existence, but my requests for payment are ignored. What redress have I?"—In reply: None, we fear; at any rate, if the former proprietor of the paper has failed, it looks like a case of throwing good money after bad to sue.

SPOTS ON PRINTS.—PLATINO TONE says: "Can you tell me the cause of spots on the enclosed? I am very careful in manipulation, using separate dishes: 1, One first wash; 2, gold tone; 3, second wash; 4, platino tone, well washed; then, 5, fixing. They will appear sometimes in a few days. These were toned on December 20 last."—On the data given it is impossible to say the cause of the spots beyond that it is want of care in the manipulation, but at what stage we cannot say. The spots rather look as if particles of pernicious matter came in contact with the paper while in a moist condition.

ARTICLING PUPIL.—GUARDIAN writes: "I am guardian of a youth who has a great taste for photography, and has already done some fair pictures. About what should you say would be a fair sum for articling him for three years? A photographer here, in a small way of business, wants 75*l.* for three years, the lad to have no wages the first year, 2*s. 6d.* a week the second, and 5*s.* the third. The lad is 18 years of age."—We should say, in the circumstances, Don't pay any such sum under such terms. There is not much to learn in photography now that everything is supplied ready for use, and the remuneration now is very small.

A. G. B.—1. The method described should answer. 2. It is a chemical and not a mechanical mixture, and therefore a comparison cannot easily be made. 3. Let F =focus of lens, f =focus of supplementary lens, and d =distance of separation, the focus of the single combination being, we will suppose, 12 inches, and you wish to obtain a focus of 10 inches, the following formula is given $10 = \frac{F \times f}{F + f - d}$. The best position would be behind. Yes; biconcave for increasing, and biconvex for decreasing focal length. 4. The omission is an oversight, although the substance is referred to in Practical Notes.

ANIMATED PHOTOGRAPHY.—CINEMATOGRAPH asks: "1. The names and addresses for films and cinematograph apparatus for entertainments, same as used at Empire and Palace theatres, London. 2. What is about the cost of cinematograph complete (without films)? 3. What is the power used to drive films on apparatus? 4. Have seen them driven by hand. Is that the usual method? 5. What is the largest picture shown on screens, and has the sheet to be wet or damped, similar to magic-lantern and limelight views?"—In reply: 1. The pictures at the places of entertainment named are, we believe, shown by the Biograph Syndicate, of Great Windmill-street. Write them for particulars. 2. Difficult to say, but it might range between ten pounds and a hundred. 3 and 4. The pictures above referred to are, we believe, electrically driven, but they are commonly driven by hand. 5. Twenty feet square would be considered a very large size; the screen need not be damped.

STEREOSCOPIC PHOTOGRAPHY WITH ONE LENS.—COLONEL GUBBINS says: "I remember seeing an advertisement of an arrangement for taking stereoscopic pictures with one lens. The price was, I think, 10*s. 6d.* I have looked for it in vain in the ALMANACS, both this and last year. Can you tell me (1) the name of the apparatus, which was an arrangement of mirrors; (2) the maker, or where it can be bought; (3) if it is of any use?"—In reply: Apparatus of the kind can be obtained of Mr. Theodore Brown, of Salisbury, or Mr. Fallowfield, Charing Cross-road, W.C. The system is quite practicable for taking stereoscopic photographs with a single lens, but the lefts and rights of the picture are reversed.

FACTORY ACT.—W. says: "I have a small house away from the studio for printing, where six girls are employed. The other day a man called, who said he was a factory inspector, and that I must not employ the girls so long as I do, and that I must give them certain hours for meals, as well as a half-day holiday a week; also I must have an abstract of the Factories Act posted in the place, and a lot of other nonsense. What I want to know is, Does an ordinary photographic place come under the Factory Act?"—Yes, certainly; and you will have to conform with it in all its particulars. The Act is for the purpose of protecting *employés*, and for preventing them being employed too long hours &c.

WARPED DARK SLIDE.—E. JOHNSON says: "One of the dark slides of my 10×8 camera was left for a couple of months in a damp attic, and, when I wanted to use it, I found that the shutters would not draw out and the glue at the joints was soft. It was put some distance from the fire to dry, and now not only are the shutters warped, but the slide itself is twisted. What can I do?"—We fear very little. We would, however, suggest that the shutters be taken out, and the whole be put in the attic again till they become as damp as before, and then be put under pressure to dry slowly in a dry place, so that they be kept flat the while. That is the best suggestion we can offer, though we are a little doubtful of the result.

REMOVING GLASS FROM OPALINE; COPYRIGHT.—OPALINE says: "1. Could you kindly tell me the best way to get a broken glass from the P.O.P. photograph of an opaline view? It was broken coming through the post, and I want to remount the photograph. 2. I have taken the interior of a church on my own account, and have sold several copies of the same. Now I find a block has been made from one of the prints, and is being used as a cover to a magazine without my being asked if it could be used for such a purpose. If I put the photograph into copyright, will it prevent any more prints being taken from the block without my permission?"—1. Soak the opaline in water for some hours; it can then probably be removed. 2. Yes, we think so; but the photograph should have been registered in the first instance.

DEVELOPMENT OF UNDER-EXPOSED NEGATIVES.—G. BARKER says: "1. I should be glad to know how far development of negative ought to be carried in case of under-exposure. I find that, when the developer is much or little diluted, the plate begins to fog at the end of twenty or thirty minutes. I have tried adding bromide—say at the end of ten or twenty minutes—but this does not prevent the veil or fog. 2. I should also be glad to know how to improve an over-exposed and fogged negative. I tried reducing, then intensifying, but the result was plate returned exactly to its original state."—1. The development should be continued as long as any detail can be obtained. You do not say what developer you employ, but there should be no fog in the time named. That may, possibly, be due to too much light while developing. 2. Only by the method you have tried. Probably you did not reduce sufficiently, or, more probably, the negative was light fogged.

LENSSES FOR FLASHLIGHT WORK.—QUICK LENS writes: "Could you inform me the best kind of lens to use for flashlight photography? I should want a lens that would give a good depth of focus, say a dinner table with a dozen men down each side, and the room so small that it would be impossible to plant your camera anywhere but at one end, looking straight down the table. I have been using a Ross 12×10 Doublet, which, of course, is a good lens, but thought perhaps there might be a quicker lens and one with greater depth of focus, as I have to stop a Ross down, and therefore make it slow."—In reply: Most of the best flashlight work recently produced has passed under our observation, and we have found, upon inquiry, that it has been produced by the aid of lenses very much diaphragmed down. Some of the newer anastigmats might answer our correspondent's requirements at a larger aperture than his old lens, but the cheapest advice we can give him is to continue using the latter, and abbreviate his exposures by increasing the efficiency of his light.

ENLARGING, &c.—MERCURY STAIN writes: "1. Given an average negative, about how many times may it be enlarged and still appear about as good as the original (without any working up), many enlargements looking rather inferior because of the absence of half-tone? 2. Is it usual when applying for a situation to ask for rail fare? 3. When intensifying with mercury, unless all the hyposulphite of soda has been washed out of the film of the negative, a brown stain is caused. Is there any method of getting rid of the stain? If so, how?"—1. All depends upon the quality of the negative; and what is an "average negative?" Generally, when there is an absence of half-tone, that is due to the negative, or the quality of the enlargement, rather than the degree of amplification. 2. If at a long distance, we believe it is. 3. In intensifying with mercury, when there are brown stains, they are generally caused by imperfect fixation, i.e., the silver hyposulphite not brought into the soluble condition. It is doubtful if the stains can be entirely removed. Try rebleaching in the mercury solution.

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EX CATHEDRÂ.

SOME time ago we inserted an appeal from the Head Master of the Orange-street Board School, Southwark, for lantern slides, wherewith the children of one of the poorest quarters of London could be entertained and instructed. What measure of success attended the appeal we do not know. A day or two since, however, we received from the well-known amateur photographer, Mr. John Bushby, whose pictorial work in South-eastern Europe has brought him well-deserved distinction, a case of lantern slides, which he has authorised us to use on his behalf for a good purpose. We have sent them to Orange-street, and we are sure that, by whomsoever they are seen, the pictures will be highly appreciated. Mr. Bushby tells us that he is off to Corfu and Greece for a couple of months. More power to his (photographic) elbow, so often as it is exerted on behalf of the poor children of squalid Southwark.

* * *

We are asked to again draw attention to the International Congress of Photography, which will be held in Paris this summer. A Committee has been appointed under the presi-

dency of M. Janssen. This Committee is subdivided into five sub-commissions, which will have charge of the five sections, and will prepare the programme of the work to be carried out in the sessions of the Congress. These five sections are constituted as follows: 1. Physical Questions relating to Photography. 2. Photographic Materials. 3. Photographic Chemistry. 4. Terminology and Bibliography. 5. Legal and Professional Questions. All applications for admission to the Congress, for which the fee is fixed at ten francs, as well as all other communications, should be addressed to the General Secretary, M. S. Pector, 9, Rue Lincoln, Paris. Among the members of the Committee may be mentioned Messrs. Vidal, Lippmann, Braun, Lumière, and Molteni. We trust that the Congress will be successful in its aims, although, having regard to the results of former meetings at Brussels, Paris, &c., during the last eight or nine years, we have no faith that the outcome of the gathering will have any practical advantage for photography in these islands.

* * *

LIKE their brethren in this country, American photographers are being exercised by a proposed Copyright Bill, which seeks to injuriously affect their interests. By the kindness of a friend we have received the report of a judgment recently given in a United States Circuit Court, the effect of which can scarcely be to leave the equanimity of the American photographic profession undisturbed. It appears that the Judge gave a decision that no photograph of animate or inanimate subjects can be copyrighted unless there is something strikingly original and out of the ordinary in the artist's treatment of the subject. It was an ordinary case of infringement of a coloured photograph. The Judge said: "A photograph of natural scenery is not the subject of copyright, because it is not an original conception of the artist, it is merely a skilful manipulation of the camera. Further, it is not shown there was any originality about the colouring of the photograph in question, and it was shown by the defence that the result achieved was old and in common practice."

* * *

THE gist of the remainder of the Judge's opinion was that mere skill and ability to take a good photograph was not a

subject of monopoly by the copyright laws. There must essentially enter into a valid copyright originality of conception, and, where that is wanting, no copyright can be valid. It does not appear, he remarked, that the process of colouring is anything but a skilful mechanical device, producing an extremely clever imitation of nature, and about nature there is no originality. Originality might exist in the process (which might be a subject of patent), but the imitation of nature negatives idea of originality. From the English standpoint this judgment is, of course, against common sense. Even the unjust Bill introduced into the House of Lords last session, which sought to whittle away photographers' interests in their own copyright productions, did not go so far as to absolutely deny legal protection to a man for his own work in photographic print-making, plain or coloured, due to the "skilful manipulation of the camera," which, according to the sapient American Judge, always does duty for "originality of conception."

* * *

ELSEWHERE in this week's JOURNAL we print an announcement that the London Spiritualist Alliance have appointed a special Committee to investigate and experiment with the phenomena of psychic or spirit photography. The Committee, which includes Mr. Page Hopps, Mr. J. J. Morse, Mr. Dawson Rogers and Mr. F. W. Thurstan, invites photographers to send in accounts of experiments, with the prints of results, if any, accompanied by the negative. It is the intention of the Committee to establish in London a kind of museum for permanent reference, in which negatives, prints, reports, pamphlets, &c., will be stored. The names of the Committee are well known in the spiritualist world; but there is a marked absence of persons identified with practical photography, whose co-operation we should have thought would have been invited in experiments and investigations where considerable special knowledge of the subject is decidedly called for.

* * *

IT is announced that the President of the Board of Trade has appointed a Departmental Committee upon the subject of patent facilities. The official terms of the reference are "to consider various suggestions which have been made for developing the benefits afforded by the Patent Office to inventors, and to report." The Chairman of the Committee will be Mr. F. J. S. Hopwood. Other members will include Mr. Carpmael, President of the Chartered Institute of Patent Agents; Mr. C. N. Dalton, C.B., Controller-General of Patents; Mr. Kempe, Deputy Chairman of the Board of Customs; and Mr. S. E. Spring Rice, C.B., of the Treasury. Mr. Arthur Reeves, of the Board of Trade, has been appointed Secretary to the Committee.

* * *

MR J. CRAIG ANNAN will provide the first of a series of "One Man" shows, to be held at the Royal Photographic Society's house, 66, Russell-square, by the exhibition of a selection of his work. The Exhibition will be opened on Wednesday, January 31, at eight p.m., when Mr. Craig Annan will make a few introductory remarks, and it will remain open during the month of February, from ten to four. Admission on presentation of card.

* * *

THE second and third numbers of the *King*, published by Messrs. Newnes, contain many interesting war photographs,

and for the first time in the history of illustrated journalism a feature is made of the power which tele-photography supplies, of taking direct enlarged views of distant scenes. Some incidents of the campaign have been photographed in this manner by Mr. H. C. Shelley, the *King's* energetic "special" (of whom we give a brief sketch in another part of this week's JOURNAL), and we gather from a note in our contemporary that it is intended for the future to place great reliance on tele-photography for its illustrations of the progress of the war. We congratulate the *King* on its enterprise; and we are pleased to learn that it is meeting with great success.

ARTICLING PUPILS IN PHOTOGRAPHY.

LAST week we had to reply to a correspondent as to what might be considered a fair sum for "articling" a pupil to learn the business of photography. We may mention that this is by no means the first time we have been asked such a question by parents and guardians. It is a difficult one to answer, seeing that there is really so little to learn in photography now that everything is supplied ready for use and with full directions for using them; and in face of the fact that remuneration to employees is so small, that is,—if one may judge from the salaries often offered in the advertisement columns of the JOURNAL. For example, here is one that appeared a few weeks back: "Operator and Retoucher, quick and good, abstainer, Sunday work, for branch at _____. Wages 21s." In the same issue was another: "Young man as Operator and Printer, all-round-hand, P.O.P. used, address, _____. Wages 20s. Open on Sundays." Last week we notice this: "Operator and Retoucher for branch, 25s. per week, must be quick."

Taking the first advertisement referred to, we see that twenty-one shillings for seven days' labour is three shillings a day, and, supposing that the hours are from nine till six—they are sometimes longer—this comes out at fourpence per hour. Now, the minimum wage of day labourers, such as "navvies," bricklayers' labourers, and the like is, we believe, from sixpence to sevenpence per hour; and that of carpenters, bricklayers, and similar mechanics, ninepence and upwards per hour. Of course, a photographic operator has to dress well and make some appearance, and for this and his skill he is offered fourpence an hour! The advertisement we quote stipulates that the man must be an "abstainer," and he must, perchance, we surmise, be an abstainer from more things than those indicated in the advertisement. Now comes the question, What is a fair sum, as premium, for articling a pupil to enable him to earn the munificent salary of fourpence an hour and dress well upon it?

It must not, however, be taken that the cases we have quoted at all represent the salaries that operators are usually paid, though we regret to say that they are generally very low nowadays, and for the reason that there is at the present time so very little to learn, and, as a consequence, the labour market, as the unskilled labour market always was, is over-stocked. It is a relief to know that high skill and artistic abilities are better recognised and remunerated in some quarters, for we notice an advertisement only last week of a gentleman seeking an appointment at four and a half guineas a week. Of course, to earn any such sum as this a premium is warranted; but, in many cases where a premium is obtained, it is more for the

money and services for nominal salaries than anything else that the "articling" premium is obtained.

But, though it be granted that, with modern plates and papers, cheap apparatus, and readily accessible elementary literature on photography, the difficulty of producing passable results in portrait and view work is greater than we have supposed, nothing is detracted from the fact that the articling or apprenticeship system in photography is never found to work satisfactorily. It is not easy to define a "knowledge of photography," or of the "business of photography." An honours' medallist at the City and Guilds' examination may find himself very much at sea when he comes to take his first studio portrait of a squalling infant, or attempt to persuade a lady sitter to order a 24×20 framed carbon enlargement from a cabinet portrait. These things are not learned in the ordinary way, and cannot be assured by articling or apprenticeship.

We begin to think that the successful photographer, like the poet, is born, not made. A good studio manner, like the good bedside manner so much prized by professors of the healing art, does more towards making a man popular with the public than a whole encyclopædia of dark-room knowledge. To paraphrase the popular saying, It is not exactly what you do, it is the way in which you do it. And again, though the grammar of lighting and posing may be acquired by constant work and observation in the studio, success in portraiture may not follow as a matter of course. In many trades and professions the service of an apprenticeship passes for competency; but, in photography, the mere fact that a young man has been bound for a time to a professional photographer is a guarantee of nothing. The sole test of ability in photography is the production of work which shall command the remunerative patronage of the public.

We come across many cases of youths anxious to learn portrait photography by working in the studio with the principal, but it is seldom that a photographer in good practice cares, even with the inducement of a premium, to prepare a possible rival. It is a very human feeling in such times of keen competition. In no other profession with which we are acquainted does the personal element count for so much as in photography, and those men who have made a position for themselves in it are scarcely to be blamed if they give scant encouragement to a system which may operate adversely to their continued success. On the other hand, the lower grades of photographers may look kindly on the articling or apprenticeship system for reasons of their own. As a rule, such men have little to teach, and their pupils, of course, have therefore no great opportunity of learning much. But, as we have already said, the articling or apprenticeship system does not work well in photography, and we are sorry that we can see no way at present in which matters can be improved.



Minature Painting and Photography.—Will minature painting ever take the place it once held in the fine arts? The Society of Miniature Painters, which was formed a few years ago, is making good progress, and several R.A.'s have become honorary members of it. The fifth Annual Exhibition of the Society is now open at the Modern Gallery, in Bond-street, and professional portraitists will do well to visit it. There is no question that photography did a great deal towards killing minature painting, but, at the same time, many of the old minature painters turned photography to a good account by colouring photographs; exquisite work they did, and high were the prices charged, and obtained, for the work. Three, five, and up to ten guineas was not uncommon for

a highly coloured small photograph; but then the work was really worth the money, they were like fine ivory miniatures. Where is such work to be found now? High class—that is, really *high class*—coloured photographic miniatures seem to be quite ignored by first-class photographers, who at one time made a special feature of them—but why? By the way, it may be mentioned that the late Sir Wm. Newton, who was one of our finest miniature painters, was one of the founders of the Photographic Society—now the Royal—and was for some years one of its Vice-Presidents.

Aluminium.—The uses to which aluminium are being put at the present time are indeed multitudinous. In connexion with photography its applications are tolerably well recognised. It is largely, by reason of its lightness, taking the place of brass for the metal fittings of amateurs' field cameras. For the same reason it is extensively employed for the mounts of lenses. Another application of the metal in connexion with photography is in flashlight compositions in place of magnesium. Its advantage over magnesium in this case is that its light is considered to be more actinic than that of magnesium, and that the product of combustion—the "soot"—is lighter and more easily got rid of out of the apartment. The latest application of aluminium that we have heard of is for the manufacture of horse-shoes. American owners of racehorses have, so we read, been using them a good deal of late. Owners of cameras with aluminium fittings that have been long in use will, no doubt, fancy that aluminium horse-shoes are better suited to the grass of the race-course than they are to macadam roads or the granite blocks of the streets of large towns.

New Instantaneous Shutter.—At the meeting of the Paris Academy of Sciences, held on the 8th inst., a new arrangement for the product of quick exposures mathematically measured was exhibited and described by M. Guido Sigriste. The modifications embodied in the apparatus, as set out in the *Comptes Rendus*, consist in a means of regulating the width of the slit of the shutter, keeping the edges absolutely parallel, and of moving the plane of the shutter a small determinate distance (0.1 millimetre) from the focal plane. The duration of the exposures can be varied the fortieth to five-thousandth of a second. The photographs exhibited showing the work of the new shutter (a "focal plane" type) had no fog, and no part suffered from imperfect illumination.

Lens Formulae.—At a recent meeting of the Physical Society Mr. T. H. Blakesley read a paper on "Exact Formulae for Lenses." He made use in it of his previously given definition of focal length with respect to magnifying power (referred to in the *Proceedings of the Physical Society* for November 1897). By this method, instead of as usual representing the focal length of a lens as the distance between two points, the author treats of it as a simple line. Following the lines of his paper referred to, Mr. Blakesley showed a method of determining accurately the constants of combinations of lenses, and showed how practical use could be made of it in the method of racking out telescopes for astronomical work, determining refractive indices, &c.

Formalin as a Preservative.—Photographers are familiar with this most useful substance as a hardener of gelatine merely, but it has functions that might be useful to them in other directions. It is one of the best preservatives known of various animal and other substances liable to putrefaction and other fermentation. Obviously the very property it possesses which renders it useful in the known direction referred to would prevent its use as a preservative of thin solutions of glue; but, without having tried it, we yet are under the impression that it should be an excellent preservative of that favourite mountant of all—starch. Then, again, with carbon prints in frames, which, under certain conditions, are liable to attacks of the mildew fungus, it would be an excellent thing, before placing the backboard of the frame in position and pasting it down, to place at the back of the print a piece of blotting-paper dipped in formalin. Its vapour would diffuse into all the air inside the frame, and effectually kill any mildew germs, which are what may be termed seeds or spores of the mildew fungus.

Does Backing Plates Interfere with Sensibility?

—A few weeks ago we called attention to a discussion at the Photographic Club as to the allegation that backing a gelatine plate rendered it slower than it would have been if unbacked, and also mentioned that, as the assertion had been made before, it would be desirable to settle the point in a tentative way. Since then the subject has twice been discussed at the London and Provincial Association without any definite conclusion being arrived at. The general impression, however, appears from the reports to be that it really does not in reality slow the plate; but, as it prevents the reflection of light from the back of the plate on to the film, a brighter negative is obtained—one more free from veil—which might lead to the idea that it was less fully exposed. One thing, however, is quite certain, namely, that for very many subjects the backing of the plate does very materially improve the quality of the negative. Still, the question remains, Does a plate that is backed in reality necessitate a prolonged exposure? It is an interesting as well as an important one; it is also one that should be decided authoritatively.

Photogravure in Colours.—As will be seen from the report, some photogravures in colour were shown at the meeting of the Royal on the 16th, which were much admired, though the method of their production was not described. Prints from engraved plates in colours are not new, neither are they from photogravure plates, as they have been done systematically by the house of Goupil and that of Hanfstaengl and others for some years, but the method is somewhat tedious. It is this: The plate is inked up locally with the different colours, which are blended in the operation, and, when the inking up is completed, the impression is taken. It need not be mentioned that great skill on the part of the workman is required to obtain good results in this way, and the rate of production is necessarily very slow. Some time back we saw the method in operation in a Continental house, and we were told that it was only possible, with the large plates we saw being worked, for a man to get more than a couple or three prints off per day. They were, however, very fine when obtained. It is to be hoped that the prints shown the other night are produced by simpler means than this.

BRITISH PHOTOGRAPHY FROM THE AMERICAN POINT OF VIEW.

[THIRD ARTICLE.]

So much interest has been aroused by the extracts we have already given from the American criticisms of British photographic work recently exhibited in the United States that we are induced to make levies upon a further batch of notices that have appeared in some of our Transatlantic contemporaries lately to hand.

In the *Photo Era*, a well-illustrated and most artistic monthly production emanating from Boston, the following very high compliment is paid to English landscape work:—

The landscapes from England show the highest artistic merit and the greatest intimacy with artistic effects. In them lies a lesson that will take long to learn. Last year the same lesson came, and as forcibly as this; but our landscape workers have not, as a general rule, profited thereby. It will be, at least, unfortunate to let another such opportunity pass. I speak, of course, only generally.

The most obvious elements of excellence in the British landscapes are these: Primarily, a broad, broken, expressive foreground, as in paintings, an unimportant middle space, and abundance of appropriate, well-defined clouds filling in the sky. Even a casual glance shows these merits to be general in the English work.

To compare our American landscapes with them, the exhibit by numerous examples shows a tendency in American work manifestly inartistic, but surely easy to overcome. The faults, to mention only three, are, first, a foreground often blank and generally inexpressive for lack of sufficient light and appropriate objects; secondly, a centralisation of objects of interest, especially in the middle distance; and, lastly, empty skies. Blank foreground, centralised objects, and plain sky—forty-eight out of sixty-five landscapes from American workers had one or more of these shortcomings, while among the English pictures only four out of thirty-three failed in a like respect, and that, too, in such a way as perhaps to be entirely excused by the nature of the subject treated.

Mr. E. Lee Fergusson, in the *Photographic Times*, which, under its new editor, is making a great feature of pictorial photography, is not very complimentary to the Linked Ring work.

It is most unfortunate, he says, that the best of the foreign exhibitors appear to consider anything good enough for Philadelphia. After being specially invited to exhibit because they are members of the Linked Ring, and because they have won other laurels, they owe it to themselves and to those who compliment them by extending the invitation to either send a representative exhibit or gracefully decline. Such names as Demachy, Craig Annan, Ralph W. Robinson, and others, look well in the catalogue, but some of the things they saw fit to send belittle them and the world-famed organization of which they are honoured members. It were better to ignore the Europeans until such time as they shall be willing to treat our efforts seriously than to pay all charges on their third-rate work.

But Mr. Fergusson's criticisms are hardly less sharp than those of the editor of the *Times* himself, who caustically points out that the English pictures present were nearly all there [*i.e.*, at the Philadelphia Salon] by invitation, an invitation which meant admittance without examination and approval by the jury. Now, this, he proceeds, is an exceedingly pretty compliment to the recipient. It tells him—or is evidently meant to—that his works are beyond criticism, and that he will do honour by the presence of his pictures. "But, when I am invited to show myself and honour others by my presence, I put not on my worst clothes, nay, not even my second-best, but don my prettiest tie and my least-worn shoes. But not so in the case of these invited guests. True, they endeavoured to show us how big they are—by the size of their pictures, giving a decorative effect, at least—but they did not show us how strong they are—in art. A half-carat diamond is more valuable than a ton of iron, but it is infinitely smaller. And there were enlargements there from the "other side" (I cannot call them pictures) which could almost be measured by the yard, and which would not have been looked at twice by the jury had they had to stand examination. And then the monotony. A scene of bracken and trees is beautiful when well composed, but why three similar scenes, all large, and all from the same author?"

The writer proceeds: The American work was certainly the best that has yet been shown in any public exhibition, and did not stand one whit behind the best English work on the walls. This speaks volumes for the great strides our photographers are making, and I predict that it will not be long before the members of the Linked Ring will send only their best work to be shown over here, and will not send it on invitation either, but will have to submit to a jury like the rank and file. Of course, there were some poor pictures present, pictures lacking in judgment, in harmony of light values, in purpose, but the general average was excellent.

REFLECTION AS AN AID TO EXPOSURE.

THE editor of the *Photographisches Wochenschrift* gives an account of some experiments he has made to utilise the light which passes through the film during exposure without affecting it. That such is the case may readily be proved by placing one plate behind another in the dark slide: upon development an image will also be found upon the second plate. Herr Gaedicke points out that the first attempt to utilise this waste light by turning it back to the film was made by Brewster. Unfortunately, the thickness of the glass presents difficulties in applying the idea to plates, but films, being much thinner, are comparatively free from drawback. A pack of six films was exposed for 120 candle metre seconds behind a sensitometer. The following numbers appeared after simultaneous development:—

Film	1	2	3	4	5	6
Sensitometer No.	15	11	8	4	1	0

A number of experiments were then made to obtain by trial and error three negatives exactly corresponding with films Nos. 2, 3, and 4. The exposures were converted to seconds and used to express the quantity of light which each plate had received. This gave the following result:—

Film	Exposure Given.	Calculated Exposure.	
		Given.	Calculated
1	120'0 c. m. s.	—	
2	33·3 "	33·3	$= \frac{5}{18} \cdot 120$
3	9·4 "	9·25	$= \frac{25}{18^2} \cdot 120 = (\frac{5}{18})^2 \cdot 120$
4	2·6 "	2·57	$= \frac{125}{18^3} \cdot 120 = (\frac{5}{18})^3 \cdot 120$
5	— "	0·71	below the inertia of the plate.
6	— "	0·2	

It follows that each film absorbs $\frac{5}{18}$ and transmits $\frac{13}{18}$ light. The co-efficient of absorption is, therefore, 0·722, and of transmission 0·278. The peculiar fact was also observed that comparatively small quantities of light did not deviate in their effect upon the film, and were absorbed.

and transmitted in similar degrees. Experiments were then made by exposing films backed with paper and tinfoil. The latter was, of course, the more efficient. If the transmitted light could be totally reflected, the normal exposure should be reduced to $\frac{1}{18}$, but, as there is some loss in reflection, it was found by experiment that $\frac{1}{12}$ normal exposure was the correct proportion. It follows, therefore, that exposure may be reduced 25 per cent. when films backed with tinfoil are used, a consideration of some importance for instantaneous photography under unfavourable conditions. When using films backed with tinfoil, two important facts must be remembered. As the image is partly at the back of the film, the developer must be given sufficient time to bring out the full exposure. As a film saturated with developer can only be freed from it by prolonged washing, it is desirable to fix the film before exposing it to light.



SOME METHODS OF CONTROL IN PHOTOGRAPHIC PRINTING.

SPEAKING before the Borough Polytechnic Photographic Society, on the 17th inst., Mr. G. J. T. Walford said that in pictorial work the proportion of negatives that would not be improved by some control deliberately practised in printing was a very small one indeed, and he held that, for the photographic picture-maker, any device in printing was permissible by which the limitations incident to the process were successfully overcome.

He had recently had the opportunity of examining a large number of landscape negatives, and, speaking generally, he thought that, as regards skies and clouds, they might be classed under four heads, viz. :—

(a) Negatives in which suitable clouds were not only present, but in which they also printed out with the landscape, and needed no control to secure the best results. It was not often desirable, however, to obtain, by a compromise in exposure, clouds and landscape on the same plate, as such a procedure usually resulted in a very distinct loss of quality. "Sea" and "open river" subjects gave, perhaps, the most satisfactory results without recourse being had to any method of control.

(b) Negatives in which suitable cloud effects were present, but which required a longer, sometimes a very considerably longer, time than the landscape to print out. These could be remedied by the application of matt varnish on the glass side of the negative, which should be scraped away from those parts at which its assistance was not required; or the back of the negative might be covered where necessary with tissue or tracing paper and worked upon with stump or water colour, but he obtained the most satisfactory results through the medium of ground glass. A spoiled negative was cleared of all emulsion and squeezed in contact with a damp silver print made from the negative to be treated, then by means of fine emery powder a ground-glass effect was produced on those parts of the glass that coincided with the portions of the negative it was desired to control, the sky being left quite clear. The silver print was then removed, and printing performed through the partially ground glass in conjunction with the negative. A focussing screen might be substituted where difficulty was experienced in grinding the glass, and the necessary control obtained by means of blacklead or water colour.

(c) Negatives that possessed a thin sky, without clouds, but with a broken and intricate sky line, presented perhaps the most difficulties, and he thought there were probably not many photographers of the rank and file who would accomplish the task of blocking out such a sky with credit to themselves. The lecturer then went on to explain a method by which cloud forms might be suggested, the existing weak skies of this class of negative being utilised to this end. A sheet of ground glass was placed in a printing frame with an uncontrolled silver print, and fastened up together as a child's drawing plate. Finally, powdered blacklead was then worked into the ground glass with chamois leather, or other suitable material, over such places as it was desired that the high lights of the sky should come. Water reflections or other high lights could also be introduced at pleasure in a precisely similar manner.

(d) This class included negatives without clouds, but in which it was desired to introduce some by means of combination printing. If the negative was sufficiently opaque to secure a white sky after the landscape was printed, well and good, but, if not, some means must be adopted to obtain it; and this could be done by the usual methods of blocking out either by painting over the sky with Brunswick black or one of the other preparations sold for this purpose, or by vignetting.

Leaving the question of clouds, he next proceeded to deal with those negatives which exhibit excessive contrast and hardness. In such cases he advocated a judicious treatment by the method of control known as sunning or toning down. With P.O.P. this was very simple, but he

assumed that most pictorial work was executed either in platinum or carbon. With either of these processes the difficulty was that the image in the printing frame was in the one case but partially visible, and in the other not visible at all. For platinum he recommended the following mode of working: Estimate the amount of toning down required, then place the printed paper under clear glass, covering those parts needing no treatment; fix with a drawing pin near the part to be treated a small piece of P.O.P.; then allow the light to act on the selected portions of the print and also the scrap of P.O.P. together. The tinting of the P.O.P. will serve as an indication of the actinic value of the light, enabling the worker, with a little practice, to correctly gauge the amount of reduction secured. With carbon, he placed a sheet of ground glass in contact with the negative, and sketched lightly with pencil upon the ground glass the leading lines of the composition and of the parts requiring modification. If this was done, a carbon print might be controlled almost as easily as platinum and in much the same manner, the carbon print, however, being treated under the pencilled ground glass.

Such methods of control as he had described could, of course, be applied in any other ways that would readily suggest themselves to the individual worker, and results might often be considerably modified, according to the will of the worker, by the omission of some object or detail considered objectionable, as well as by the addition of some object deemed desirable.

FOREIGN NEWS AND NOTES.

Starch in Emulsion.—An interesting controversy is pending in the German law courts concerning the use of starch in emulsion. From the *Deutsche Photographen Zeitung* it appears that a photographer named Junk obtained a patent in Germany some time ago for the preparation of sensitive materials with an emulsion composed principally of boiled starch, with a small addition of gelatine, such material being especially suitable for subsequent retouching or colouring. The granting of the patent was opposed at the time by the Berlin Photographic Society, but unsuccessfully. The Dresden United Photographic Paper Company bought the patent, and an effort was then made to bring gelatino-bromide papers within its scope. The Eastman Company was attacked, and, although they were using raw instead of boiled starch, the action was successful in the Courts of First Instance. An appeal was granted, and the matter stands for a new trial at an early date. Meanwhile, the *Neue Photographische Gesellschaft* has informed the patentee that they also use starch in the preparation of gelatino-bromide paper. As the latter has declared this to be an infringement of his rights, the *Neue Photographische Gesellschaft* has instituted an action to annul the patent. We trust the action will be successful, for not only is the process devoid of originality, but there seems also to have been a want of discernment on the part of the Judges in extending the scope of the patent to the raw material.

The Preservation of Indiarubber Goods.—*Helios* states that, according to Fane, stearine is a very good preservative of articles made of indiarubber. The stearine should be cut into fine shreds and used as a packing. Portions of diving dresses have been kept in this manner for twenty years without becoming brittle or stiff. The hint may be of use to photographers in keeping their apparatus in good order.

The Cinematograph and Surgery.—We recently drew attention to the value of the cinematograph as a means of instruction in surgery. Some further remarks upon the subject, by Dr. Doyen, appear in the *Bulletin Phonographique et Cinématographique*, and they deserve the attention of our surgeons. Dr. Doyen states that many technical details, which appeared to him satisfactory, have had to receive further consideration since he has studied the cinematograph records of his own operations. The cinematograph supplies him with a true picture of what he has done, and he can thus reconsider the most minute details of the operation, with a view to their improvement in future cases. It must be self-evident that the opportunity of seeing an animated photograph of an operation from the point of view of a spectator should be of the greatest interest to the surgeon.

Hard Negatives.—The *Photographische Chronik* recommends that the plates should not be alumed, and that, after fixing and washing, they should be immersed in a weak solution of blue-green dye. This stain will be absorbed most in the shadows, where no reduction of silver has taken place. After drying, the negative will print with less contrast and give a better rendering of the lights and shadows.

An Old Lens.—In Liesegang's *Photographischer Almanach*, Dr. von Rohr asks for information concerning any types of lenses he has omitted to include in his recent work on the "History of Photographic Optics." In particular, he would be glad to receive for inspection a lens constructed by Petzval in the fifties or sixties. It was a doublet, and both combinations were composed of three cemented lenses. A specimen made by Voigtlander would be preferred.

A SIMPLE METHOD FOR PREPARING SALTED PAPER.

FRANZ HOFBAUER describes, in the current number of the *Camera Obscura*, the following simple method of preparing a matt-surface plain paper, which differs from most methods in that plain and not boiled arrowroot is used for the salting solution.

Strong white paper is coated by means of a badger's-hair brush with a mixture of—

Arrowroot (finely powdered)	10 grammes.
Salt	0·66 gramme.
Distilled water.....	33 c. c.
Carbolic acid (pure)	6 drops.

This mixture should be well shaken before use till the whole of the precipitate is suspended. The brush should be kept about half full of the mixture, and the paper brushed over in all directions, so as to obtain as even a coating as possible, and, finally, all marks evened out with the damp brush. Any streaks faintly visible after drying will not matter, as the important thing is not so much an even coating as an even damping of the paper. The paper should now be allowed to dry spontaneously, without heat, in a place protected from dust; it should be left to lie flat for twenty-four hours.

In order to sensitise this paper, the two following solutions should be prepared:—

A.	
Silver nitrate	5 grammes.
Distilled water	25 c. c.
B.	
Citric acid	5 grammes.
Distilled water	25 c. c.
Carbolic acid (pure).....	6 drops.

Mix immediately before use just enough of these solutions by pouring one part of solution B into two parts of solution A. The paper should be supported at an angle of 45°, and fastened down by the corners by sealing-wax, and the sensitising solutions painted across it from left to right without pressure, so that the streaks of the liquid shall run into one another. Metal pins must not be used, nor should the brush be fastened with metal.

The sensitising solution will gradually become cloudy from the chloride and arrowroot taken up from the surface of the paper by the brush, but this is of no moment, if the brush be not dipped too far into the liquid so as to disturb any precipitate.

Thick, rough papers as a rule require more coatings than thin smooth ones, though a good deal depends upon the kind of paper.

The sensitised paper should be allowed to dry spontaneously in a place free from dust, and, as a rule, paper sensitised at night will be ready for use the next day; it will keep longer, but better results are always obtained if it is used at once, and the freshly prepared paper is always slightly damp, which is in favour of the prints.

The finest prints are obtained from tolerably plucky negatives with the following platinum bath. The paper should not be much over-printed, and then washed for about half an hour in three changes of water and then treated with the following:—

Potassium chloro-platinite	1 gramm.
Distilled water	300 c. c.
Nitric acid (pure)	20 drops.

The prints will turn first reddish-brown, then violet-black, and finally black. Toning should only be carried to the violet-black stage, then washed and fixed in a ten per cent. solution of hyposulphite of soda for a quarter of an hour, and then well washed and dried. Greyish-black tones are thus obtained. If toning is carried on too long, the whites become yellow.

If, when dry, the prints do not show a fine grey and the whites are yellow, they may be toned in the following bath:—

Ammonium sulphocyanide	10 grammes.
Sodium phosphate	12 "
Distilled water	250 c. c.
Solution chloride of gold (one per cent.)	30 "

EXPERIMENTAL PSYCHIC PHOTOGRAPHY.

SIGNED by D. S. Hehner, J. Page Hopps, J. J. Morse, E. Pierce, E. Dawson Rogers, Lt.-Col. Le M. Taylor, and F. W. Thurstan (Hon. Sec.), the following appeared in the last issue of our contemporary, *Light*:

The London Spiritualist Alliance, Limited, has recently delegated to us as a Committee, with power to add to our number, the task of investigating, and experimenting in, the phenomena of "Psychic" or "Spirit" Photography.

We therefore invite all persons and periodicals interested in psychic research and spiritualism to give publicity to the fact that a regularly constituted body has been formed for the above special line of investigation, and that we invite any evidence that may be sent us by correspondents from every part of the world.

The following are some of the special classes of evidence which we are anxious to collect, tabulate, and report upon:—

1. Accounts of experiments made by private or professional operators, whether with or without cameras.

2. Prints of results, good or indifferent, accompanied, if possible, by the negative.

In both cases the evidence will be considered valuable in proportion to the information sent on the following definite points:—

(a) The social and psychic character of the operator or operators who may have exposed, developed, or handled the plates or films.

(b) The same with regard to the sitters, if any.

(c) The nature of the camera, plates, or films, and developers used.

(d) The quality of light in the room at the taking of the photograph.

(e) Whether any special background was employed.

(f) Any special tests or proofs that the results submitted were not obtained by double exposure, second negatives from altered positives, fluorescent chemicals, and other well-known methods of imitating psychic results.

(g) Precautions in regard to the plates used, and whether there was any chance, in a series of experiments, that the marked plates of any particular occasion were taken away unused, tampered with in private, and then substituted at a subsequent experiment.

Besides collecting the above evidence and reporting upon it to the Alliance, and thereby to the public, we intend, so far as the small fund at our disposal will permit us, to conduct a course of experiments ourselves, and to invite and help others to do the same. To this end we invite the assistance of any one who can offer to us personally, or through a friend, the quality of psychic mediumship through which experiments in this way are likely to be successful. In the case of professional or other mediums who require some compensation for their time or travelling expenses, a small fee will be offered.

We wish it to be expressly understood that we desire psychic photographs of every description, whether obtained by camera or without one, or whether through a negative or without one.

It is our intention, if an adequate response is given to our invitation, to establish in the rooms of the Alliance a portfolio or case in which any negatives, prints, reports, books, pamphlets, magazine articles, cuttings of publications, and similar records on the subject, may be kept as a sort of museum for permanent reference. Gifts for this purpose are respectfully solicited.

There is always a special value in cumulative evidence; but, if our proposal be fully carried out, that special value would be greatly increased, as the various pieces of evidence, gathered from witnesses and operators far apart, could be compared at any time, as objects of vision, and not as matters of mere hearsay; and certainly, if evidence of the reality of spirit or psychic photography can be accumulated, an immense service will be done, and a remarkably interesting and convincing method of spirit-communion will be brought to light.

Considering the important nature of the inquiry committed to the care and conduct of this Committee, it is felt that a ready response will be made to the foregoing requests from thoughtful students of psychic phenomena all over the world.

Communications of all kinds should be sent to the Hon. Secretary of the Committee on Psychic Photography, care of London Spiritualist Alliance, 110, St. Martin's-lane, London, W.C.

PHOTOGRAVURE.

At the meeting of the London and Provincial Photographic Association, on January 18, Mr. E. A. Hunt gave a description of the process of photogravure. His preliminary remarks were upon the position of photogravure amongst reproduction processes for art works. If, he said, artists could now get accurate reproductions of their pictures in a far shorter time than was previously the case, the credit was due to photogravure. So, too, was the fact that large numbers of the old masters and other educational art productions were now obtainable, and at such cheap rates compared with those for the older engravings, which were beyond the means of all but a few. At the same time, if the future of line engraving now looked so dull and unpromising, the credit was still due to photogravure. Photogravure exerted an influence greater than would be supposed. Not only had it affected reproduction processes, but production processes had alike been influenced. Art publishers,

and that the cheapness of photogravure, looked at alongside the cost producing engravings by the old methods, placed them in a position to produce ten plates where previously only one could be accomplished. Opposing half of these failed commercially, the loss was nothing like so serious as it would have been under the old system of line engraving. Consequent upon this, artists were able to bring their works within reach of the pockets of an ever-increasing number of people. The orthochromatic plate and the use of light filters rendered it also possible to produce the colour values of any picture, but it would be noticed that the colours of pictures had also been affected. Notwithstanding the great perfection of methods of rendering colour values, it was well known at some sets of colours reproduced better than others. Artists, knowing this, paint their pictures, which are intended for reproduction in colours suited for the purpose, possibly different to what might otherwise have been used. It would be, perhaps, interesting to observe the essential differences between photogravure and the processes which it has so largely superseded. In the old line-engraving process a steel plate was taken, and upon it was drawn the picture to be reproduced. The lines which are necessary to make the smooth steel a printing plate had then to be cut out by hand with a special tool, with an expenditure of an immense amount of artistic ability and a great deal of time. The difference between line engraving and photogravure lay in the fact that the effects of light and shade were produced in the first by lines of varying depths and breadths, while in photogravure they are produced in half-tone. Another process of producing *intaglio* plates—the etching process—is that in which a copper plate was covered with an acid-resisting varnish. Upon this was drawn, with a needle, the picture to be reproduced, and then, by means of various etching fluids, nitric acid, for instance, the design was bitten in, the acid affecting the copper only where the needle had penetrated the coating of varnish. The mezzotint process—yet another means of producing *intaglio* plates—was entirely different to the line engraving, approaching more nearly the nature of photogravure, in that the lights and shadows are in half-tone and not in line. Very few mezzotints were produced nowadays, but an example of this process, and of the preceding methods, was passed round. A copper plate was taken, and the whole of its surface rolled over with a tool like a minute file, producing a uniform burr all over the plate. Printed in this condition, it would yield a solid black impression. The artist produces his picture by scraping down the portions more or less where the high lights and half-tones are to appear. In a sense this is a reversal of previous processes, where one started with a plate which could give a mass of high light, the shadows having to be cut in by a file. In mezzotint one commenced with a plate giving all shadow, and produced the lights by scraping down. None of the methods so far depend upon the camera.

With reference to the examples of line engraving, etching, mezzotint, and photogravure passed round, it would be seen that there were certain marked differences. The photogravures looked like satin, while the true line engravings in the deep shadows were rough to the touch. Many so-called line engravings were turned out, which were in reality photogravure productions of line engravings. By remembering that the shadows of the true engraving were rough to the touch, such impostures could be detected.

To come to the production of a photogravure plate: If a painting is to be reproduced, orthochromatic plates and light filters are necessary for the truthful rendering of the colour luminosities. It is well to notice that, finally, a photogravure reproduction is at least a reproduction of a reproduction of another reproduction. Every reproduction tends to lose detail, so that one should choose a developer in the first place which will give the sharpest outlines possible.

Mr. Hunt saw no reason to name a developer, holding the opinion that was the ability of the user rather than the constituents of a developer that gave a satisfactory result. Given the negative, a transparency on glass was next required, and this was made by the carbon process. The carbon process conveniently gave a reversed image, which was necessary, unless one was content to have the final print in reverse. In transferring the carbon positives on glass, the use of collodion was often stated to be necessary, but Mr. Hunt never used so much as would fill a teaspoon. His secret lay in using rolled or plate glass instead of sheet glass. The best copper is required. If not perfectly hammered out after rolling, hollow places will exist below the surface, which, directly the acid is applied, are found out and revealed. The result is disastrous, especially if the holes occur in the high lights, as they produce, of course, a black impression. The copper then should be perfectly hammered, and "round" polished. Straight polishing gives minute lines, which greatly disfigure should they cross a face, whereas those following "round" polishing are not aggressive. The copper must be scrupulously clean. American potash in solution is brushed over with vigour, a brush like a scrubbing brush, only softer, being employed. This is followed by a bath of sulphuric acid, when the plate should be reasonably clean. When dry, the plate has to be "grained" with a very fine dust. Various gums are used: in France resin is much used; in Germany, where the finest work is produced, bitumen or asphalt as fine as flour is employed. Two or three pounds are placed in what is known as a graining box. This box is capable of being revolved on an axle, causing the dust to rise in a cloud according to the nature of the grain to be applied to the plate, the box is

then allowed to stand. The coarser particles of dust soon fall, and the longer the box is left before inserting the copper plate in the bottom of the box to receive the falling dust, the finer will be the grain. If a coarse grain is wanted, one would insert the plate at once. Looked at obliquely, after dusting, the plate appears like a fawn-coloured cloth, but directly downwards there is not much change. This grain has to be fixed by heating. The grains of bitumen become first transparent, then steel blue (the proper condition), finally, if left long enough, melting and spreading over the whole plate. In such a condition the etching fluid would fail to reach the plate at all, whereas the object of the grains of bitumen is only to prevent its access to the plate in parts.

From the carbon positive previously referred to one makes a print in the Autotype photogravure tissue, a tissue very lightly pigmented. This print is transferred to the grained copper in the usual way, using the copper as one would the single transfer paper. Exceeding care is here wanted. If anything gets between the copper and the carbon transfer, it will pierce the carbon film and allow the acid improper access to the plate. Again, no collodion is necessary for transfer, the grain on the plate is sufficient to hold the film during subsequent development of the carbon print and the etching process.

The carbon print having been developed, the next thing is to etch the plate, first varnishing the same with an acid-proof varnish on the back and round the edge to the margins of the picture, to prevent undue action of the etching fluid. The etching fluid is almost universally the perchloride of iron. Seven pounds are added to five pints of water, and the mixture allowed to boil in an enamelled pan. The clear portion is poured off, and tested with a Beaumé hydrometer for heavy liquids. It may register 50°. If so, pour off a pint and bottle it up. Add more water and boil. Test, and it should be a little weaker, say 45°. Go on until one has solutions from 50° down to 30° in easy stages. It is curious that the strongest bath with which one commences only penetrates the thinnest parts of the carbon resist. The plate, it will be noticed, grows black in these thin parts, and, when it has ceased to blacken, the plate should be put in the next weaker bath, and the next thinnest parts are etched. So one goes on, using the weaker and weaker baths, until the whole of the plate is etched except the high lights. The plate is then placed under a strong stream of water, or in a solution of potash, to stop action. The carbon film removed, one may examine the work, and, however well done, it will look to the beginner very bad. The bitumen grain is next removed by making the plate hot and rubbing off with turpentine. The copper is next thoroughly cleaned, as the slightest trace of etching fluid left in the fine detail will go on acting and clog up the work. The plate may then be proved. If one has over-etched the high lights, the burnisher will correct it; or, if the shadows want strengthening, the roulette will give a little more burr, which will retain the ink and give more depth to the print.

There was considerable discussion upon Mr. Hunt's interesting remarks, and a vote of thanks was passed with acclamation.

A SCOTTISH PHOTOGRAPHER AT "THE FRONT."

In the ranks of the special correspondents at present with our forces in South Africa, Glasgow can lay claim not only to the *doyen* of war correspondents on the active list—Bennet Burleigh, but also to the first photographic illustrator—H. C. Shelley. It is true that in previous campaigns artists have used the camera to register the scenes on and around the battlefield, but in their case the camera was only an accessory to the pencil; in Mr. Shelley's case the camera, *plus*, of course, the man in charge, is the illustrator, and, as a good horseman can take more out of his horse than a novice, so, in the hands of the expert photographer, the camera is capable of successes in circumstances which to the *dilettante* would spell failure.

This is Mr. Shelley's first experience of war, but he is peculiarly well equipped to take the field as the pioneer of a new branch of illustration in the days of specials, and the photographs that he has contributed to the first number of *The King*, Newnes' new weekly, show not only the stern, bare realities of war, but in several instances, notably *Difficulties of Transports*, have the added merit of artistic qualities. His *Dead showing a dead Boer lying in the trenches*, simple in the extreme, is yet one of the most telling pictures of the actual horrors of war that we have seen.

Mr. Henry Charles Shelley is a man in his prime, born in the sunny month of June, 1860; his father was a yeoman farmer and part of his early days were spent in Lincolnshire, in the vicinity of Peterborough, where the proximity of so many of the grand cathedrals of England would in all probability instil into him that love of the beautiful which has found vent through the medium of his photography. Here he learned the accomplishments of a "young man from the country," and his ability to ride a horse, and shoot straight, are the acquisitions that he will now find the benefit of, although we trust that his peaceful calling—peace in the midst of war—will not render his shooting necessary.

That he has not forgotten the country of his early days is proved by his admirable lecture on "The Broads," where his discourse, with its racy anecdote and eloquent flow of language, vied with the beautiful lantern

slides in securing for him a very high place in the esteem of his audiences.

After he came to Glasgow, he wrote a considerable number of articles for *The Glasgow Herald*, including a series on microscopic work, on which he was an authority. Photography now gained a hold on him, and his "capacity for taking pains," assisted by an inherent artistic faculty, speedily gained him a prominent place in the art-science. The method and attention to details, necessitated by his microscopic researches, proved useful and prevented the "artistic" running away with him, so that we see in none of his work that extravagance that mars the work of not a few holding high place in the photographic world.

He claims to be the originator of photographic notes in the modern lay press, by reason of the "Photographic Jottings" which he inaugurated and conducted with great success in the *Glasgow Evening Times* for many years. So great was the popularity of this feature in that paper, that it resulted in the founding on March 11, 1895, of the *Evening Times Camera Club*, a society that at one time laid claim to being in the first flight of the "large" photographic societies in the kingdom. For some years Mr. Shelley acted as Honorary Secretary of the Club, and under his tactful and enthusiastic guidance it flourished amazingly. He did not exhibit to any extent, but, on the few occasions on which he submitted his work to the criticism of the Judges, he gained several medals.

He has a thorough knowledge of photography in all its branches, and his ability with the hand camera, combined with the pen of a ready writer, make his employment as a war-correspondent illustrator an acquisition indeed to Newnes.

In April 1897, he left Glasgow for London, but his friends would not allow him to go away empty-handed, and, as a token of the high esteem in which he was held in Sanct Mungo's Town, he was presented before his departure with a handsome gold watch.

Since going to the metropolis he has contributed articles to the *Windsor* and *Ludgate Magazines*, the *Sketch*, *Black and White*, and many other important papers, including *American Illustrateds*.

He has also wandered into the realms of book-making, and his *Homes and Haunts of Robert Burns* (illustrated) gained a fair share of public favour.

As a man, he had in an exceptional degree the faculty of making and retaining friends; the following tribute from a personal friend, may well conclude this meagre sketch: "He was a man, who, having once set his mind on a thing, would carry it through, and in emergencies was ever 'cool as a leek,' and will therefore make a first-rate war correspondent, as he will not scruple to face any danger to gain his ends. A kind, sympathetic, and trusty friend, and a most sociable companion, a better man never walked in shoe leather; he was ever ready to put his hand in his pocket to assist a more unfortunate brother, and his advice was always sound and helpful. I pray God that he may be spared to come back among us, when I know he will have made a name for himself."

ALLAN BLAIR.

IS A SHOW-CASE A STRUCTURE?

At the North London Police Court, on January 17, Thompson Fisher, photographer, of Mare-street, Hackney, was summoned before Mr. Fordham for erecting a building in the forecourt of his house beyond the general line of frontage without the consent in writing of the London County Council.

Mr. Chilvers appeared for the County Council, and Mr. C. V. Young defended.

Mr. Chilvers said that the defendant had erected a show-case in his front garden for the display of his photographs without the consent of the Council as required by the London Building Act of 1894. This structure was 13 ft. long, 8 ft. high, and 3 ft. wide, and was made with wood, covered with zinc, on a brick foundation. The front was glazed, and at the back were panelled doors. It was lighted by gas. Evidence was given to show that no consent for the erection of the show-case had been given, and that it stood 8 ft. 9 in. beyond the general line of frontage.

Mr. Young contended that the London Building Act was designed for the regulation of the habitations of men, and he argued that, as this was not a habitable structure, it would be exempt from the operation of the Act. He quoted cases to show that a builder's office, which was 10 ft. high, and a wood and iron bungalow of four rooms, erected as an advertisement and for sale, had been held not to be buildings within the meaning of the Act.

Mr. Fordham: In the first case, the office was on wheels; in the second, the bungalow was never meant for habitation or use at the place where it was erected.

Mr. Young: This structure is not intended for habitation.

Mr. Fordham: It is intended for use—for the display of the defendant's photographs.

Mr. Young went on to say that the present show-case took the place of a similar one which had been there since 1891, and had never been interfered with. Moreover, the County Council had proceeded against

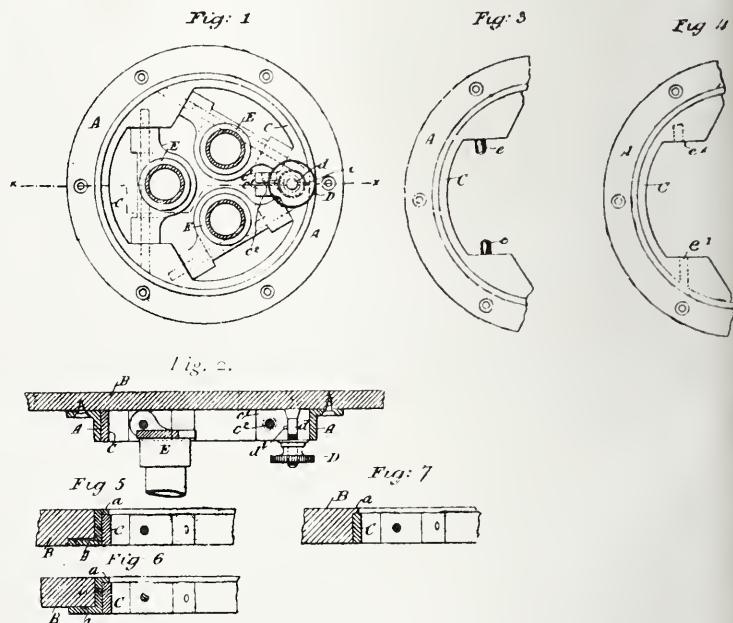
another photographer in the same street, in 1894, for erecting a similar show-case, and had failed. As they did not appeal, the defendant thought he would be quite safe in taking away his old case and renewing it.

Mr. Fordham said at present he was of opinion that this show-case was a structure, and that the consent of the Council was required for its erection; but, still, he thought it would be very hard on the defendant to pull down a structure which really did no harm to any one. He adjourned the case to consider his decision, and in the mean time he hoped the defendant would come to some arrangement with the Council.

A NOVEL TRIPOD HEAD AND STAND.

MR. G. W. ATKINS, of the Palmers Villa, Elstree, is an esteemed worker of many years' standing, to whose accomplishments in the mechanical branches of photography our pages in former times often bore witness. He will be remembered by many of our readers as a valued member of the London and Provincial Photographic Association, of which he was long an officer. Endowed with many abilities out of the common, Mr. Atkins is alike highly skilful in making his own cameras, shutters, brasswork, and even his own lenses. One of the best types of amateur workers, he has long been a devotee of stereoscopic photography. For some years resident in the country, he has now returned to take up his residence near London.

The latest outcome of Mr. Atkins's ingenuity takes the form of an ingenious method of attaching the camera to the stand. Quoting from the words of his patent specification, the bottom of the camera is furnished underneath with a metallic ring, permanently secured. Into this ring is inserted another ring, to which are secured the legs of the tripod. This ring is divided transversely, so as to be capable of ex-



pansion or contraction within the other ring, to make a firm bind therein or to permit of easy removal.

To proceed with the description: A is a metal ring, permanently secured to the camera base, B. When a ring is used, it may be secured by means of screws, as shown in fig. 2, or by letting the ring into the base, as shown in figs. 5 and 6.

In the cases of figs. 5 and 6, where the camera base is cut away to receive the ring, an internal flange, a, at the upper edge of the ring, is provided, and in fig. 7, where there is no ring, but merely a recess, a flange, a, is formed out of the material of the camera base.

c is also a metal ring divided transversely at c, and provided at that point with an expanding device; for instance, a conically ended screw, d, inserted between the lugs, c¹, c¹, and furnished with a thumb nut, e, for operating the cone or wedge to and fro, to expand the ring to the extent of its capacity, or allow it to contract. Its capacity for expansion is limited by a screw, c², passed through the lugs, c¹, c¹ (see fig. 1). d¹ is a small pin inserted in the screw, d, to prevent its rotation when the thumb nut, e, is turned.

The ring, c, being inserted into the ring or recess, a, so that it bears up against the camera base, or against the flange, a, the thumb nut is operated to expand the said ring, c, as above explained, to bind tightly with the ring or recess, a, attached to the camera, and in this way a quick and rigid attachment is effected.

To remove the support the thumb nut is unscrewed, thereby releasing

the wedge and allowing the ring, c, to contract, when the apparatus can be readily taken apart.

Mr. Atkins has shown us one of the new tripod heads. These are made, at present, of aluminium. In use, the head is placed in the ring in the base of the camera, instantly "expanded" by means of the screw adjustment, and so firmly fixed that there is absolutely no fear of the camera becoming detached. It is one of the simplest and most effective means of attaching the camera to the tripod that we have seen, and, if placed on the market, will, no doubt, be highly popular.

JAMES PATRICK—AN EDINBURGH PHOTOGRAPHER.

IN the *Photo-Beacon* for January Mr. F. Dundas Todd gives the following sympathetic sketch of Mr. James Patrick, the well-known Edinburgh photographer:—

Some dozen years ago, when I was living in Scotland's capital, and "artistic" photography ran in my mind night and day, a bright idea suddenly flashed upon me, and that was to organize a club whose sole aim would be to help its members in that particular direction. I had acquaintanceship with a number of really good amateur and professional photographers, and was also fortunate enough to have the run of about half a dozen painters' studios; so I laid my little scheme before them, and ultimately we formed the "View-finders" Club, which was composed in equal numbers of painters and photographers. We met once a month, and each member in his turn had to produce at least four examples of recent work for criticism by the others. I will never forget these meetings—how we sat around the poor victim, and between puffs of tobacco smoke told him very plainly what we thought of him and his work. This I will say, it was a capital training, and when I was in Edinburgh recently I met a number of the old members, and one and all referred, with bright and glowing eyes, to the good old times now gone.

One of these was "Jim" Patrick, as we all liked to call him. Although engaged in professional photography, he had never been associated in any way with a photographic society, but I had spotted the work he was doing, and willingly or unwillingly—I must frankly say modesty is his greatest failing—he had to become a member, and a splendid fellow he proved to be once his diffidence began to wear off.

Though far removed from him during the past seven years, I never lost sight of him, and with pleasure I marked his steady upward progress. Every now and then I saw his name published, with the information that he had been the winner of another gold, silver, or bronze medal, as the case might happen to be, and so, when I once more found myself in "Auld Reekie," I invaded him in his home one evening, and insisted on seeing every one of his medalled pictures. I was simply charmed with them, both from a pictorial and from a personal standpoint, for all of them were made round about Swanston, a "sleepy hollow" lying under the shadow of the Pentland Hills. It is a locality dear to lovers of the picturesque, but has other interests, for it was in this neighbourhood that Robert Louis Stevenson spent his youthful days, wandering at his sweet will among fertile fields or climbing to the higher pastoral solitudes.

Many of my readers will be tempted to exclaim, "No wonder he could make pictures! With such material, who could fail?" But one of Mr. Patrick's friends confessed to me that he had frequently visited the same region with his camera, and never yet had brought back anything that was worth comparing with the work of Mr. Patrick, and I may add he is no mean photographer; so that it is not merely a question of subject, but very much a matter of individual. Now about this individual and his method of working. Mr. Patrick first saw the light not so very many miles from where I did, but I should fancy a few years later, and I acknowledge being forty-one. His father was and is a professional photographer, having started in business as far back as 1853, and is well known as the maker of possibly the most successful portrait of Thomas Carlyle, which, by the way, was reproduced about a year ago in *Scribner's Magazine*, and was accompanied by a very interesting article by Mr. Patrick, sen., giving his reminiscences of the great author. Before entering the photographic profession our subject underwent a very thorough art training. For four years he was a student in the Royal Institution, Edinburgh, and, having then shown sufficient ability, was permitted to attend the Royal Scottish Academy Life School, which he did for four years more. During that period and since, he exhibited in the Royal Scottish Academy and many other exhibitions. So, when he turned to photography, he brought to it a training for his future work that was simply ideal.

His photographic training he received from his father, his first and only employer, and for that branch he was certainly in good hands.

Mr. Patrick's methods of working certainly spell success, but I am afraid there are but few who would care to follow them—the more's the pity. He haunted Swanston until he simply became saturated with the glamour of the place, and had every topographical feature in his mind's eye. When the idea of a picture gets into his head, he pins a large sheet of white paper on his easel, and with charcoal sketches the main features of the scene. Then the sheep, cattle, or horses, as the case may be, are sketched in, and the composition arranged down to the minutest detail. Weeks are sometimes spent in this way, and then he arranges with the shepherd, if sheep be the accessory, or grieve, should it be cattle or horses, to be on the ground at a certain day or hour—even the

particular condition of light is settled beforehand. After the camera is in position it is not unusual for hours to be spent in getting the animals into the correct position, and only when everything is just as he planned it is the exposure made. On one occasion it was only after days of patient labour that the predetermined combination was secured, but the result was a much-medalled picture.

As showing the thoroughness of Mr. Patrick's nature, I may state that, in the case of the beautiful picture of the old lady, entitled *Eventide*, in order to get sufficient light to give a little detail in the shadow side of the figure, he had a mason knock a hole in the wall, and then sent a carpenter to put in a window.

Stevenson describes Swanston as "a little hamlet of some twenty cottages in the woody fold of a green hill." Mr. Patrick says of it, "Abundance of pictorial wealth is all around. At every turn the eye is delighted, and, in whatever mood one may wander, sympathetic scenery presents itself. Nature is continually delighting the mind with its atmospheric glamour, and in every mood one sees new possibilities of picture-making. One could work here for a lifetime, and always find something new."

THE LATE J. A. HARRISON.

WE are sorry to learn of the death of Mr. J. A. Harrison, which took place on the 19th instant as the result of an attack of pneumonia. The deceased gentleman, who was seventy-eight years of age, only survived the death of his wife ten days.

The late Mr. Harrison will be chiefly remembered in connexion with the Pantoscopic Camera, of which he and the late J. R. Johnson were the inventors over thirty years ago. Of this camera the late Mr. Traill Taylor in the ALMANAC of 1892 gave the following description and opinion: "Probably no camera which has ever been introduced at all approaches in mechanical ingenuity the one I shall now endeavour to describe. Although every part of it except the stand is in motion by means of clock-work during the taking of the picture, such is the perfection of both its principle of construction and its workmanship that I have frequently subjected negatives taken by one in my possession to examination under a compound microscope, the limit to the power employed being that degree of amplification at which the silver granules forming the collodion image became too pronounced.

"The pantoscopic camera is composed of a small chamber capable of rotating freely on a strong pin fixed in a circular base plate. This pin is situated directly under the optical centre of the lens. The back is closed, all but a narrow slot reaching from top to bottom, and has wings fitted to it for the purpose of opening or narrowing the slot, or making it wider opposite the foreground and closer for the sky, so that, no matter how dark the one and how bright the other, the picture will be harmoniously rendered. Attached to and projecting laterally from each side of the camera is a steel rail, on which runs, on two castors, a carriage bearing the dark slide, which is covered with an endless band of opaque cloth running over two rollers at each end of the carriage, and is attached to the camera proper by means of a brass flange. The edge of the circular plate on which the camera rotates is grooved, and on this groove two strings fold, one end of each being attached to the base, the other to the carriage that carries the dark slide. The camera rotating, and the base being stationary, the strings fold and unfold respectively, giving a rectilinear motion to the carriage, which runs upon the rail at the back of the camera. The diameter of the circular plate upon which the strings fold has a definite relation to the focus of the lens, and thus the relative motion of sensitive plate and lens is obtained. The plate is therefore always tangential to the supposed cylinder upon which the image ought to be received. The camera is driven by clockwork so arranged that a perfectly uniform motion is maintained during the whole time that the camera is being rotated. The dimensions of the plate depend, of course, upon the focus of the lens and the angle of view to be obtained. If the focus of the lens be three and three quarter inches, which is that in our camera, then, if the whole horizon is to be included, the length of the plate must equal the circumference of a circle whose radius equals the focus of the lens. Our camera, however, is fitted for half-plates, and on these we secure an angle of 120° on the base line, the extreme ends being necessarily as sharp as the centre.

"When in action, the camera, carrying the carriage with the dark slide, moves round the central pivot below the optical centre of the lens. The carriage, at the same time, has a movement of translation from one end of the rail to the other, this being effected by the strings spoken of. The axial rays only of the lens are employed in forming the image, hence there is no distortion.

"Pantoscopic negatives of the size above indicated have yielded enlargements 36 x 12 inches, in which there is no want of sharpness. The perspective is panoramic. This invention was originated in 1862, but it was three years later ere it was quite perfected."

Many other ingenious mechanical photographic devices of which he was the inventor were from time to time exhibited by the late Mr. Harrison at various societies, including the South London, the Photographic Club, the London and Provincial, the Royal, &c.

DEVELOPERS, OLD AND NEW.

On the 18th instant, Mr. C. H. Bothamley gave a lecture upon "Developers, old and new," and found awaiting him a large audience. This was, no doubt, due in the first place to the nature of the subject, for it would attract not only those who are students of photography, but the less thoughtful ones who try in turn every new developer which is placed upon the market. It must also be noted that Mr. Bothamley lectures with such charming ease, clear enunciation, and well-chosen phrases, that it is quite a pleasure to listen to him. This last consideration had, no doubt, its influence in swelling the attendance at his lecture.

Since Mr. Bothamley gave his experiences of ortol to the Club, two years ago, no fewer than four others have, by the enterprise of German chemists, made their appearance. The lecturer said that each of these had a strong claim to public support, and that a consideration of their merits would form the groundwork of his lecture. Although his chosen title was "Developers, Old and New," the older compounds would be merely referred to by way of comparison. Some might say that the old developers were good enough for them, and that they did not want to bother themselves with anything new. But we can never say, in this world, that we have attained the best possible results, or, at any rate, the best under all conditions.

What has been the solid gain to photography through the introduction of these new developing agents? We may most certainly say that they have put the printing of bromide papers upon an entirely new footing. Few realise the enormous difference between the bromide printing of to-day and that of a few years back, when the operator had only one developer—ferrous-oxalate—with which to coax an image from the paper. In this important field of work we have at least gained, and we say also that in a lesser degree these new developers have helped us to produce lantern slides on bromide plates with ease and certainty. Some lantern slides, developed with the new agents about which he had to tell would be shown on the screen at a later stage of his lecture.

The first developer which he would notice, diamido-resorcin, had a close relation to amidol, which, it would be remembered, was nearly allied to phenol, or carbolic acid. At the risk of frightening those nervous souls who generally fled at the sight of a chemical or mathematical symbol, he would point out the actual difference between the composition of these bodies. [Demonstration.] Amidol and diamido-resorcin darkened to about the same extent with access to air, an action which was at once retarded by the addition of a preservative such as sodic sulphite. They still darken, but at a slower rate. Amidol crystallises in white crystals, and diamido-resorcin in small yellowish leaflets. He believed that the extent to which amidol alters in the air has been exaggerated; it seems to be largely dependent upon purity. Here was a bottle of amidol-Hauff, which he had purchased years ago, which was as good as ever. On the other hand, he had another sample, obtained from a different source, which had discoloured to an alarming extent. Diamido-resorcin alters very little in the dry state, even if left exposed to the air on a sheet of paper; it should be used with sodic sulphite, and the fact remembered that it is more soluble in a three per cent. of that salt than when the strength is raised to five per cent. He would hand round prints of bromide paper which had been developed with this new agent, and, although the two prints were of the same subject, they were very different in appearance. The difference was gained by varying the length of time under development. A short immersion in the developer gave a soft negative, or bromide print, but, if development is allowed to go on, you can get as much vigour as you like. The drawback with prolonged development is a deep orange stain, which will affect both gelatine and paper. On the whole, it may be thought that diamido-resorcin does not present any great advantage over amidol.

The next developer to come under review was a very peculiar substance indeed, and its name was hydramine. It is formed by the combination of hydroquinone with another substance, and was presented in the form of plates having a pearly lustre. Dissolved in a solution of sodic sulphite two per cent., with two per cent. of potash metabisulphite, it can be left in an open vessel for weeks without getting discoloured. One of the most curious properties of hydramine was that it would act as a developer when mixed with water alone. It was unusual and remarkable to find a substance which would do this. He only knew of two others, of which eikonogen was one. Certainly it took a couple of days to do its work, but still the fact remains that an aqueous solution of hydramine, without anything else, would develop the photographic image.

The developing power of hydramine is not much increased by the usual agents, and the best alkali to use is found to be caustic lithia, which possesses several advantages over caustic potash or soda for the purpose. The composition of the developer recommended in 1000 parts of water is as follows:—Anhydrous sodic sulphite, 16 parts; hydramine, 5 parts; and caustic lithia, 3 parts. This solution keeps well, and, even if exposed to the air in an open dish for twenty-four hours, the discolouration only amounts to a golden tint. The addition of a small quantity of bromide to this developer sets up a restraining action, and there is a very decided alteration in the gradation. (A number of plates developed with hydramine were here shown, as were also some bromide prints. The latter showed a tendency to fog, but half a grain of bromine per ounce of developer was sufficient to clear the whites, and the scale of gradation was shortened, as in the case of negatives developed with the

same agent.) Hydramine has no tendency to stain like diamido-resorcin; it is, in fact, a substance of an entirely new class, with certain points of resemblance to both metol and amidol.

The two remaining new developers to which he would call attention were first cousins to hydroquinone, and these again represent a new class of developers. A chemist would describe them as halogen substitution derivatives. These two developers were respectively known as adurol-Hauff and adurol-Schering, denoting the names of their German makers. In the first-named, and comparing its composition with that of hydroquinone, an atom of hydrogen was displaced by one of chlorine; but in the second developer—adurol-Schering—the atom of hydrogen was displaced by one of bromine. One could therefore otherwise describe the first-named as chloro-hydroquinone and the second as bromo-hydroquinone. As they all knew, hydroquinone by itself was not a developer, but each of these new bodies—the adurols—have a faint developing action. They alter very little by exposure to air; they are more soluble in water than hydroquinone, and with sodic or potassic carbonate they exert a developing power greater than that of the last-named.

As they all knew, it was next to impossible to get good results in cold weather with hydroquinone; indeed, on some occasions in winter he had failed with that agent to get the ghost of an image. This is not the case with the adurols. They are good developers for either plates, bromide paper, or lantern slides, and he would show examples of such. Mr. Bothamley's admirable lecture concluded with an exhibition of lantern slides developed by the various agents which he had described, and they evoked much applause.

A short discussion followed the reading of the paper, the trend of which can be sufficiently seen by the following brief summary of the lecturer's reply.

He said, with regard to the amount of bromide added to the developer to affect the colour of lantern slides, that, so far as his experience went, the colour of the image depended chiefly upon the time occupied in development. If this is retarded by dilution with water or hastened by heat, you get much the same results. The repeated use of the same lot of developer for many plates is a question depending upon the degree of discolouration of the liquid by the air. One of the most useful properties of these new developers is that they do not, like pyrogallol, get rapidly dirty. When they discolour, you must change the solution. All the slides he showed were developed one after the other in their respective developers, only one batch of solution being used for each lot. The influence exerted by the addition of bromide to the developer was by no means the same in every case. With hydroquinone the effect was very great and immediately apparent; with metol, on the other hand, a large quantity of bromide must be employed before one could get any marked result. If the whole of the light action is developed out, much the same result can be scored with all developers, the colour of the image being the only point of difference discernible. He believed that the adurols would be found very valuable for cold-weather development, and that they would work well with metol, but his experiments in this direction were not yet concluded.

Mr. Webber, who occupied the chair, closed the proceedings with a few well-chosen words.

THE THORNTON "GLASSOLINE" FILM.

The prospectus of the Thornton Film Company is in circulation, the capital being 20,000*l.*, with a present issue of 7500*l.*. Two of the Directors, Messrs. J. E. Thornton (Chairman and Managing Director) and C. F. S. Rothwell (Chief Chemist) are Directors of the Flexoid Syndicate, the promoters, who have fixed the purchase price of the patent rights a 9000*l.*

A perusal of the prospectus, which extends to eight pages, shows that the Company anticipate an immense opening for the film, the advantages of which are set forth at considerable length and in great detail. Glassoline film is described as "pure gelatine, coated with the sensitive emulsion, and having a backing of transparent paper, which can be instantly removed from the film itself when the negative is finished and dry." Between the film and the backing is a transparent material, "flexoid," which "renders the backing waterproof, thus preventing stretching, cockling, unequal expansion," &c. Other properties of flexoid and the entire film are also quoted. The "disadvantages of films hitherto produced" are set forth, and glassoline film is declared to be "the perfection of simplicity, reliability, and cheapness."

It is stated that, so soon as the parent Company shall have successfully shown the scope and value of glassoline films, a larger Company, with a capital of 100,000*l.*, will be formed. Messrs. Cunliffes, Brooks, & Co., of Altrincham, are the bankers, and no doubt they will furnish copies of the prospectus on application.

Financial criticism does not fall within our province, and we have not seen a sample of glassoline film, so that upon these two points we are not called upon to offer a remark. But we may pause to note the references of the prospectus to the "disadvantages of films hitherto produced." Roll celluloid films are declared to be a trouble to manipulate, owing to their tendency to roll, and this and other difficulties are stated to cause many photographers to discard their use, whilst novices and amateur photographers are said to find almost insurmountable difficulties in their use. Again, after stating that "all the other

materials or methods hitherto tried for film supports have been found wanting," a paragraph is devoted to pointing out the respects in which each of those systems "did not fulfil all photographic requirements."

It will thus be seen that, in claiming to succeed where all those systems are declared, in the prospectus, to have failed, glassoline film demands to be judged by very stringent tests indeed. We await its introduction with much interest. In the meanwhile, we cannot help feeling that its chances of a favourable reception at the hands of the photographic public are somewhat handicapped by the wholesale condemnation of past and present film processes in which the prospectus somewhat incautiously indulges. We are practically familiar with the history of film photography for the last twenty years. Most excellent results were produced by some of the older methods, whilst of modern systems it is sufficient to say that some of them have great possibilities, and at least one of them is in successful world-wide use.

THE "KRISTAL" PLATES.

At the Photographic Club, on Jan. 17, Mr. J. P. W. Goodwin demonstrated the use of B. J. Edwards & Co.'s "Kristal" plates for lantern and stereoscopic slides and transparencies by contact printing. The "Kristal" plates may be handled without the use of a dark room, in an ordinary gas-lit room, without fear of trouble. The aim has been to make a plate not only easy to work and convenient to use, but also one which should give results as nearly as possible like the old slides by the albumen process, which was the prince of processes for lantern work. No better slides have been made than the old albumen slides. "Kristal" plates had an exceedingly fine grain; only a high-power glass would reveal it. This, with pure blacks or any degree of warmth, perfectly clear high lights and detail in the shadows, were the characteristics of the plate. Consequent upon the extreme slowness of the emulsion, the plate was suited only for contact printing, and not reduction, although he had made slides with the plates by reduction, two or three hours to a whole day, being required. The plates were not intended, however, for reduction processes. In the speaker's opinion they possessed all the advantages of the ordinary plate in addition to other good points. First among these, naturally, is the fact that no dark room is essential when using the plate. Secondly, good results are to be got from negatives which with ordinary plates would be out of the question. Then there was the big range of colours, very easily obtained. Two developers are given, one for black and one for warm tones. It should not be forgotten that with some negatives it was almost impossible to get a good black. In that case he would ask—why try? It will give a good warm tone, perhaps! Mr. Goodwin preferred warm tones, and found a tone much to his liking by diluting the black tone developer and increasing the exposure. He showed what he would call an average negative, and proceeded to print from it for black tones, an inch of magnesium ribbon burnt at twenty inches distance giving just about sufficient exposure. For brown tones he would increase the magnesium to four inches, or decrease the distance, according to the tone required, and dilute the black tone developer. Several slides were produced during the evening with great precision and ease, and a number of finished slides by Mr. B. J. Edwards and Mr. Goodwin were afterwards shown upon the screen. The use of Rodinal for black tones, with any class of negative, was alluded to, and the following formula was given:—

Rodinal, 1 part in 12.

Bromide, 2 grains per ounce of mixed developer.

THE PHOTOGRAPHIC CLUB.

Of the Photographic Club, now in the twenty-first year of its existence, Mr. Alexander Mackie has recently written the following short but sympathetic history:—

During the summer recess of the old South London Photographic Society, in 1879, a number of the members met weekly, by invitation of Mr. A. Brittlebank, at his studio, to discuss the then absorbing topic of the gelatine process. These meetings proved so pleasant, and the informal and conversational character of the proceedings was found to bring out such a valuable fund of knowledge and experience from men who would not willingly speak at the formal meeting of a scientific society, that, at the resumption of the Society's session, it was resolved to form a separate organization to continue the "Brittlebank" meetings. Accordingly the Photographic Club was formed, and held its first meeting on November 19, 1879, and has continued to meet every Wednesday evening to the present time.

For several years no subjects were announced for discussion, but it must be remembered these were times when every photographer was of necessity an experimenter, when even the more simple processes of photography were not so thoroughly understood as they are now, and when but few of the preparations which every dealer sells now were to be had commercially. Of late years, however, it has been the custom at most of the meetings to have a lecture, demonstrator, or set subject for discussion announced, though opportunity is still afforded to members to bring forward matters of interest, or to ask for information with regard to their difficulties. The Club always extends a hearty welcome to all

interested in photography, and at lantern lectures, of which there are several during the winter session, ladies are specially made welcome.

The Club has a good photographic library, and members have the privilege of borrowing the books for home reading.

In the twenty-first year of its existence, the Club has naturally to some extent changed its methods; but it has not departed from its traditions and has not changed its nature. Its meetings are social meetings of photographers to discuss photography.

THE THORNTON-PICKARD COMPETITION.

THE Thornton-Pickard Manufacturing Co., of Altrincham, announce the following photographic competition for 1901, in prizes. The competition will be divided into three classes as follows:—Class I.: 35*l.* will be given in prizes for the best sets of four instantaneous photographs of subjects of general interest taken with the Thornton-Pickard "Amber" or "Ruby" Camera and Time and Instantaneous Shutter. Class II.: 35*l.* will be given in prizes for the best sets of four instantaneous photographs of quickly moving objects taken with the Thornton-Pickard Focal-plane Shutter. Class III.: 35*l.* will be given in prizes for the best sets of four instantaneous photographs of any subjects of general interest taken with any of the Thornton-Pickard various patterns of "Time" and "Instantaneous" or "Snap-shot" Shutters. There will be five prizes in each class as follows, making a total of fifteen prizes: First prize, 15*l.*; second prize, 10*l.*; third prize, 5*l.*; fourth prize, 3*l.*; fifth prize, 2*l.*

The following are the principal rules:—

All competing photographs must be sent in on or before October 1, 1900. Any received after that date will not be admissible.

The prizes are offered for sets of prints. Each set must consist of four prints from different negatives. Any number of sets may be entered in either class. They may all be different subjects, or a series of the same subject in different styles or positions, but must be instantaneous exposures of from $\frac{1}{8}$ to $\frac{1}{1000}$ sec.

The prints may be any size, but must be printed direct from the negatives. Enlargements not allowed.

All prints must be mounted; this may be done in any way the competitor desires, but framing is not allowed.

The pictures may be printed by any process, on any kind of paper, but transparencies are not allowed. Composite negatives or printing from two or more negatives not allowed.

Ordinary spotting of defects on the prints or negatives will be allowed, but retouching will result in disqualification.

Both prints and negatives will become the absolute property of the Thornton-Pickard Manufacturing Co., Ltd., who will have the sole right to publish, copyright, and use them for advertising and other purposes.

Successful competitors must furnish such information as may be deemed necessary, and, if desired, submit their apparatus for inspection and state when and where it was purchased.

Intending competitors in Class I. must use both the Thornton-Pickard Camera and Shutter. Either the "Ruby," "Amber," or any other pattern of their cameras, and any pattern of their Time and Instantaneous Shutters may be used.

In Class II. any make of camera (including hand cameras) may be used, but the picture must be taken with a Thornton-Pickard Focal-plane Shutter.

In Class III. any make of camera may be used providing it is fitted with any of their various patterns of "Time and Instantaneous" and "Snap-shot Shutters."

Competitors can enter in one class only.

Every print must be clearly marked in ink on the back of its mount with the following particulars:—

- (a) The name and address of competitor.
- (b) The class in which it is entered.
- (c) The exposure given, and full particulars of the circumstances under which the picture was taken.
- (d) The pattern of camera and shutter used.

The negatives must accompany the prints.

The pictures will be judged by the Directors and officers of the Thornton-Pickard Manufacturing Co., Ltd., whose decision shall be final. No Director, officer, or employee of the Thornton-Pickard Manufacturing Co., Ltd., will be allowed to compete.

The pictures in Classes I. and III. will be judged mainly from the standpoint of technical excellence, general interest, form and arrangement of subject.

Those in Class II. will be judged mainly from the standpoint of technical excellence, movement, form, and uniqueness of subject.

Entry forms will be supplied on application to the Company.

Our Editorial Table.

THE CORNEX FINDER.

R. & J. Beck, Limited, 68, Cornhill, E.C.

THE construction of the Cornex finder is such that the amount of view included in it is stationary, and remains so from whatever position it is observed.

The shade which is provided to prevent the reflection from the top lens folds down when not in use and protects the lens from injury.

At the back of the front lens an oblong mask has been placed, which can be revolved by turning the small knob on the top of the finder, and by this means a vertical or horizontal view is seen.



For attaching the finder to the camera two separate metal carriers are provided. It is recommended that one of these be screwed on to the top and the other on to the side of the camera, in the required position. It is then only necessary to press the finder down on to whichever carrier is to be used, and it will be held firm and in position by the springs at the sides of the carrier.

An examination of the Cornex finder shows it to possess the properties claimed for it, the image given, besides being stationary, being also extremely brilliant. It is strongly and neatly made, the outer case being of metal, retails at five shillings, and should be found of great service by hand-camera workers.

CATHEDRAL PICTURES BY PHOTOGRAPHY.

By Frederick H. Evans, 27, Fairford-road, Bedford Park, W.

In the sympathetic photography of cathedral architecture Mr. Evans is probably unexcelled. He has the faculty of extracting all that is pictorial and, we might add, poetical, out of his subjects, and he does it by means of pure photography. His work is always well defined; it is characterised by natural effects of light and shade, and bears throughout the impress of having been produced as a result of a thorough mastery of the tools at hand, yet, whilst it satisfies the most artistic tastes. In fine, while Mr. Evans is doing perfect justice to his subjects, he is also, consciously or not, illustrating the capacity of photography for rendering pictorial architectural effects without the assistance of photo-faking or photo-patchwork.

In deciding to publish some of his well-known architectural photographs Mr. Evans is making an experiment to which we cordially wish every success. Four specimen prints are before us. They are signed proof impressions in photogravure by the Swantype Company and it is in this form that it is intended the prints shall be issued for sale. The prints are, of course, on plate-marked paper, but they are enclosed in brown cut-out mounts, $15\frac{1}{2} \times 12\frac{1}{2}$, being thus adapted either for the portfolio or for framing.

The following four subjects comprise the first issue:—Lincoln Cathedral: The Towers, from the castle; A Stairway, in the south-west turret; The Angel Choir, from the south choir aisle. Ely Cathedral: The Octagon, from the north choir aisle (free from the usual benches and chairs).

Mr. Evans states that, if this first issue should be taken up freely enough, he proposes following it at intervals with others from his cathedral sets, his intention being to issue nothing but what is exceptionally artistic, both in choice of subject, treatment, mode of reproduction, and issue.

We trust that the result of his experiment will justify Mr. Evans in continuing the issue of his series of cathedral photographs. Of the four examples before us we can say nothing in higher praise than that they are beautiful photogravures of beautiful photographs, well worth the half-guinea each it is proposed to charge for them. They would constitute an excellent adornment for the walls of a gentleman's house. Their delicacy, their charm, their refinement are so distinct and convincing that in years to come we shall be disappointed if we do not find that they have outlived in popular esteem most of the puffed-up and belauded "pictorial" rubbish of the day which is the outcome of photo-faking.

PHOTOGRAPHIC MOSAICS FOR 1900.

Edited by Edward L. Wilson. New York: E. L. Wilson. London: Dawbarn & Ward. *Mosaics* is the last of the American annuals to reach us; but, though late, it is welcome. In its 300 pages there are some sixty excellent half-tone reproductions of portraits and studies, about the same number of articles, and a lengthy summary of the experiences of 1899. It is a chatty and instructive volume, and many of the portraits are delightful representations of the fair sex. A practised hand has been at work in the compilation of *Mosaics*, which we can recommend to our professional readers as likely to supply them with many a useful wrinkle in practical work, many a pose for adoption in the studio.

THE "AXE" BRAND CARTRIDGES.

Fuerst Brothers, 17 Philpot-lane, E.C.

THE latest introductions of the Axe-brand preparations for photography comprises a flashlight powder which, it is stated, contains no explosive material such as chlorate or permanganate of potash or picric acid. There is no report on combustion. Each package contains a fuse paper, by means of which and a lighted match ignition is secured. The powder has been tried in our presence, and we can state that it is a safe and pleasant mixture to employ. With the Axe flashlight cartridges a small piece of fuse paper is also supplied; each cartridge contains sufficient powder to photograph a group or interior. The intensifying cartridges give a deposit of a reddish colour, which can be reduced by water, if necessary, or removed altogether by solution of ammonia. The reducing cartridges contain material for mixing a reducing solution, which may be used indefinitely.

CATALOGUE RECEIVED.

The Thornton-Pickard Manufacturing Company, Altrincham.

IN sending us a copy of their New Illustrated Catalogue for 1900, the Thornton-Pickard Company state, in regard to the sale of their well-known shutters, that after making them for the last twelve years, during which time the sales have gradually increased year by year, the year 1899 eclipses all previous records. The experience the Company have gained during these years enables them now to produce what is really a faultless article. Every single part of every shutter is most carefully made, and all evenly balanced, which accounts for the fact, as the Company point out, that it is so seldom one hears of a Thornton-Pickard shutter going wrong. Although of late the raw material employed in the making of every part of the shutter has gone up in value, yet the prices of all the Company's shutters remain the same as last year.

Besides shutters, the Company's other productions, as cameras—the well-known "Ruby" and "Amber" patterns—plate-holders, automatic stands, lenses, film-carriers, &c., are fully described.

There are also particulars of a new prize competition, in which cash prizes to the sum of 100 guineas are to be given for the best sets of instantaneous photographs sent in.

The Company send out these catalogues to all applicants for them who are interested in photography, gratis and post free.

The Company have just enlarged their premises, this being the second time they have done so since their factory was built a few years ago.

MESSRS. ROSS, LTD., of 111, New Bond-street, W., and 31, Cockspur-street, S.W., are issuing a series of neatly produced supplementary catalogues of their optical and photographic instruments. Prominent notice is given to their prismatic binocular glasses, which it is stated are supplied to Sir Redvers Buller and many other officers in the South African Field Force.

* * Owing to exceptional pressure on our space this week, we are compelled to hold over several notices of apparatus and other items for Editorial Table.

News and Notes.

WITH a neat Calendar for 1900, Mr. R. W. Howes, of East Dereham, also sends us his latest price-list of enlargements, &c.

WE are pleased to learn that Mr. A. L. Henderson is now fully restored to health. He is shortly proceeding to Bordighera for the spring.

Photographic Light is the name of a new monthly magazine devoted to photography. It is issued by Messrs. J. H. Smith & Co., Chicago.

OFF TO THE WAR.—A son of Mr. E. H. Holder, of the Studio, Redhill, Surrey, is proceeding to the front with the Imperial Yeomanry. Mr. Holder, who has had considerable experience in South Africa, will carry with him the good wishes of all.

MR. ALFRED UNDERHILL, of 32, Clarendon-road, Croydon, writes: "Having seen the paragraph re name of maker of stereoscopic slides in THE BRITISH JOURNAL OF PHOTOGRAPHY of January 12, I beg to inform you that I can make and supply stereoscopic slides either on glass or as paper prints."

THE Röntgen Society's next Ordinary General Meeting will be held on Thursday, February 1, at 20, Hanover-square. A paper will be read by Dr. Hugh Walsham, "Röntgen Rays in Diseases of the Chest." Mr. A. Hastings Stewart, M.R.C.S.E., will show a small Egyptian mummy and skiagrams of the same.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—At the meeting on February 1 there will be a demonstration of the new Sandell film. Visitors are welcome at the White Swan, Tudor-street, E.C. It is announced that Mr. H. Vivian Hyde will see to the musical arrangements at the Annual Supper in February.

At the Ordinary Meeting of the Manchester Literary and Philosophical Society on January 9, 1900, Mr. Thomas Thorp exhibited two film gratings of a ruling designed to weaken the direct image, and to condense the illumination of the spectra of the first and second order, and thus to compete with the prism spectrum in brilliancy.

CRIPPLEGATE INSTITUTE.—A course of eleven practical lessons in photography, specially arranged for amateurs, will be given at the above Institute Fridays, at seven p.m., commencing Friday, February 2, 1900. Instructor, r. C. W. Coe. Further particulars can be obtained on application to the manager, Cripplegate Institute, Golden-lane, E.C.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY'S EXHIBITION, February 27 to March 1, 1900.—Mr. W. E. Dunmore, of the Tella Camera Company, Limited, 110, Shaftesbury-avenue, London, W., has kindly consented to receive and forward London exhibits for the Loan Collection. Envelopes may be sent to Mr. Dunmore, addressed as above until Thursday, February 22.

A DAILY contemporary says that Mr. W. L. Wyllie, A.R.A., is about to assume the position of a pavement artist, though he will, doubtless, earn more than a pavement artist's emoluments. His appearance in this capacity is due, not to necessity, but to charity, in order to help the Mayor of Rochester's fund for the sufferers by the war, and will take place at a promenade concert in the Corn Exchange of the City on the Medway, which has inspired his most successful pictures.

HOW KIPLING WAS PHOTOGRAPHED.—Mr. Kipling left for the Cape on Saturday. On boarding the liner his chief desire was to escape the interviewers and the camera. There were two or three animated picture operators aboard, anxious to snap-shot the great man. They waited for him at casual corners. It was hopeless to think he would pose, and one of them, it is understood, succeeded in his fell purpose. Mr. Kipling was certainly photographed. He had gone upstairs to his cabin. As he came on deck he found a camera directed towards him. He turned hastily to retreat, but Sir Donald Currie, entering to the spirit of the thing, seized him by the arm and compelled him to stand his ground. So the two were photographed side by side—the man who makes us run and the man who makes them talk.

"**ACUTENESS OF VISION AMONG SAVAGES**," the first of three lectures on "The uses of Primitive Man," was recently delivered at the Royal Institution by Dr. W. H. R. Rivers, F.R.C.P. According to the rough observations of travellers, he said, savage races have far more developed senses than races that are civilised. Careful and scientific investigation, however, shows that what Europeans lack is not so much acute senses, but the highly specialised knowledge which would enable them to take note of small indications. Short sight is almost unknown among primitive peoples, and there is no doubt that savages possessed the power of adjusting their eyes to darkness and distinguishing objects in a far greater degree than civilised men. Little doubt exists that this power is due to the accumulation in the retina of "visual purple," which is found in nocturnal animals. Therefore it would be interesting to learn if some primitive peoples can see better in the dark than themselves.

SEQUEL TO BETTING.—At the Clerkenwell Police Court, on January 16, James Dalgety, twenty-seven, of 9, Leighton-road, Kentish Town, was charged with remand with stealing from 43, Clerkenwell-road, photographic appliances, value 32*l*, the property of Kodak, Limited. Prisoner was formerly in the employment of Kodak, Limited, and subsequently entered the service of Emetfink, Cheapside. At the latter firm he was found in the possession of a kodak, the possession of which he could not satisfactorily account for. The property turned out to be the property of Kodak, Limited, and Dalgety was remanded. Dalgety had in his possession pawn tickets relating to a quantity of property belonging to his former employers, which he had pledged. The prisoner pleaded guilty, and exclaimed, "I must have been a fool. I started to bet, and could not get out of it." Mr. Bros said he thought the spirit of gambling was at the bottom of the prisoner's behaviour. Betting was generally associated with charges of this sort. The lightest sentence, however, he could suggest on the prisoner was three months' imprisonment.

Commercial Intelligence.

MESSRS. A. E. STALEY & CO., 35, Aldermanbury, have been appointed London agents for Messrs. Krauss & Co., Paris.

RE W. J. LE COUTEUR, Managing Director of the Photographic Association, Limited, Brook-street, Hanover-square. The public examination of this debtor was held at the London Bankruptcy Court, on January 19, before Mr. Registrar Brougham. It appeared that the Photographic Association was formed on March 31, 1899, for the purpose of acquiring his business. The statement of affairs showed unsecured liabilities, amounting to 3,916*l*, and assets estimated to produce 10*l*. The examination was concluded.

On the 16th inst. a company was registered by Jordan & Sons, Limited, of 20, Chancery-lane, London, under the title of The Brighouse Photographic Company, Limited, to carry on the business of photographers, photographic chemists, and dealers in photographic and optical goods and apparatus. The nominal capital of the Company is 1000*l*, divided into 1000 shares of 1*l* each. The registered office is situated at 2, Victoria-street, Brighouse, Yorks. The Memorandum of Association was subscribed by Mr. Arthur Hoyle Ormerod, Greenroyd, Brighouse (silk spinner); Mr. George Albert Farrar, Spring Villa, Brighouse (surgeon); Mr. John Wood, Ravenspring, Brighouse (silk spinner); Mr. Spence Ormerod, Boothroyde Park, Brighouse (silk spinner); Mr. John Edward Longbottom, Castle Fields, Rastrick, Brighouse (bank manager); Mr. Bogdale Edward Edwards, Claremont-villas, Brighouse (surgeon); Mr. Martin Manley, The Terrace, Brighouse (optician). The first Directors are to be appointed by the subscribers to the Memorandum and Articles of Association.

The case of Kodak, Limited, *versus* Elliott came before Mr. Justice Mathew in the Queen's Bench Division on January 16, and is of importance to dealers in photographic materials. Mr. D. M. Kerly appeared as counsel for the plaintiffs, and Mr. Spokes for the defendant. The plaintiffs are the well-known firm of photographic materials manufacturers, and owners of the Kodak

patents. The defendant is a dealer in photographic materials and a customer of the plaintiffs. It was stated by counsel that the plaintiff Company, in the interests of its dealer customers, imposed upon them individually the condition of selling its manufactures retail not below list prices. Finding that a particular firm of dealers were underselling Kodak goods, they took steps to prevent them obtaining supplies, and to this end they imposed the further condition upon all dealers not to resell wholesale to any other dealer without having previously obtained a written undertaking that the conditions of sale of Kodak, Limited, would be observed. The defendant agreed to these conditions on July 6 last, and goods supplied to him were subsequently traced to a cutting firm, by whom they were sold retail below list price. The plaintiff Company (Kodak, Limited) sought to recover damages for breach of the conditions of sale. Judgment was entered for them, with damages 50*l*, and costs.

Patent News.

THE following applications for Patents were made between January 8 and January 13, 1900:—

CAMERAS.—No. 406. "Improvements in and relating to Photographic Cameras." S. D. MCKELLEN.

ANIMATED PHOTOGRAPHY.—No. 432. "Improved Means of Exhibiting Photographs in Rapid Succession." J. A. PRESTWICH.

REDUCING AGENTS.—No. 470. "Reducing Agents for Photographic Negatives." Communicated by La Société Anonyme des Plaques et Papiers Photographiques A. Lumière et ses Fils, France. B. J. B. MILLS.

CURVED PRINTING SURFACES.—No. 557. "Improvements in the Production of Curved Printing Surfaces." E. S. SHEPHERD.

ARTIFICIAL LIGHT.—No. 611. "Intense Lighting Apparatus for Instantaneous Photography." J. F. GUIMARAES.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
29.....	Bradford Photo. Society	Annual Conversazione.
29.....	Camera Club	{ Some Effects of the Bicycle on the New Man, New Woman, and New Child. Rev. C. H. Grundy, M.A.
29.....	Kingston-on-Thames	{ Exhibition of Lantern Slides by Affiliated Societies.
29-31	Southsea	Twelfth Annual Exhibition.
29.....	Glasgow and West of Scotland	Sending-in Day for Exhibition.
30.....	Ashton-under-Lyne	A Tour in Scotland. Thos. Glazebrook.
30.....	Birmingham Photo. Society	Fifth Annual Conversazione.
30.....	Bootle	Adjourned Annual General Meeting.
30.....	Hackney	{ Lowestoft and Neighbourhood. H. Vivian Hyde. Pictorial Treatment of Lantern Slides.
30.....	Isle of Thanet	J. A. Hodges.
31.....	Croydon Camera Club	{ All Abroad with a Hand Camera. R. Child Bailey. Rejlander, his Life and Work. A. H. Wall.
31.....	Photographic Club	{ Opening of "One-man" Exhibition by J. Craig Annan.
31.....	Royal Photographic Society	
February.		
1.....	Camera Club	{ The Discharge of Electricity through Gases. Charles Edward Phillips. Demonstration: Messrs. Wellington & Ward's New Film. Harry Wade.
1.....	Liverpool Amateur	Demonstration: The New Sandell Film. Sandell Films and Plates, Limited.
1.....	London and Provincial	Transparency-making. J. Brooks.
1.....	Oldham	Negative-making. Rev. F. C. Lambert.
1.....	Tunbridge Wells	Practical Evening: Development.
2.....	Borough Polytechnic	Judging of Exhibition by Vote of Members.
2, 3	Glasgow and West of Scotland	{ Lantern Night: Rambles in South Devon. H. Selby.
2.....	West London	

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 23.—Technical Meeting.—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

THE HONORARY SECRETARY.

The CHAIRMAN, on behalf of the Society, expressed much pleasure at the presence of General Waterhouse, the Hon. Secretary, and congratulated him upon his recovery from his recent illness.

AN ENLARGING APPARATUS.

Mr. HUDSON exhibited an electric enlarging apparatus, with which no condenser or diffusing medium was required. It consisted of a chamber for attachment to the back of an ordinary camera, carrying the reversing back, and having at each of its sides three six-volt electric glow lamps of three-candle power. The light did not reach the negative direct, but was thrown upon it by means of a pot-opal reflector. Some bromide enlargements made with the apparatus were shown, and the exposure for enlarging from half-plate to 12 x 10 was said to be from two to three and a half minutes, according to the density of the original negative.

PREPARATION OF SILVER SUB-HALOIDS.

Major-General J. WATERHOUSE, I.S.C., read "A Note on Dr. Otto Vogel's Method of Preparing Sub-haloid Salts of Silver." He said that, in

paper published in the *Photographische Mittheilungen* for September 1899, of which he gave a translation in the last number of the Society's *Journal*, Dr. Vogel described what appeared to be a very simple and effective method of preparing the sub-chloride, sub-iodide, and sub-bromide of silver, substances which, he believed, had never been satisfactorily isolated, except, perhaps, by Guntz. Dr. Vogel's method was to treat the sub-haloid salts of copper with a ten per cent. solution of silver nitrate in excess, access of air being, as far as possible, avoided, and it was founded upon the copper bromide intensifier, but using cuprous bromide instead of cupric bromide. On trying this method Major-General Waterhouse found that the reaction was not so simple as he expected, the products all showing the presence of copper; but, acting on the supposition that the cuprous salts were incompletely reduced by a single treatment with the silver nitrate solution, he repeated the treatment, at the same time heating the solution to boiling point, when he found that copper came into solution. Three repetitions of this treatment with the bromide were sufficient to extract very nearly all the copper; the chloride required more boiling, but the iodide gave up its copper more readily than the bromide. After showing and describing the substances which he had obtained, the author of the paper said Dr. Vogel did not appear to be certain that these products were true sub-haloid compounds or only mixtures; but he was himself inclined to think, from their composition and behaviour, that they were true sub-haloiods.

A very brief conversation, in which Professor MELDOLA, Mr. T. BOLAS, General WATERHOUSE, and the CHAIRMAN took part, followed the reading of the paper.

COMING EVENTS.—A "ONE-MAN" EXHIBITION.

On Wednesday, January 31, Mr. J. Craig Annan will formally open an exhibition of examples of his work. The opening will take place at the Society's house, 66, Russell-square, at eight p.m., when a few introductory remarks will be made, and the Exhibition will continue during the month of February, from ten to four o'clock daily. February 6, Lantern Meeting, "Shakespeare at Home," by Mrs. Catherine Weed Ward. February 13, Annual General Meeting.

Croydon Camera Club.—In spite of all temptations to go elsewhere or to stay at home, there was a goodly company in the Small Public Hall, Croydon, on Wednesday, January 17, standing room only being the order in the unreserved area, and a capital evening's display ensued. To begin with, there were many of our warrior sons to cheer, one picture by the President, of the Colonials passing along by Houndsditch, proving especially acceptable. Mr. JEFFERY also received much approval for his interesting gossip about camp life at Richmond and Aldershot, illustrated by slides made by himself. Of these particularly popular was a portrait, taken in camp, of the Commander of the City of London Yeomanry, viz., the Earl of Albemarle. Before passing on to the mixed slides, the PRESIDENT took occasion to emphasise the great value of photography and the lantern might have proved in familiarising our officers in South Africa with the physical geography of the neighbourhood, and in making clear to them the natural features of the positions held by the enemy. If at Frere, Stormberg, and the Modder, and elsewhere, such lantern lectures had been given, and full use made of the remarkable powers of the tele-photo lens, he considered many valuable lives would have been saved, a remark which the audience emphatically endorsed.

Richmond Camera Club.—January 8.—Ladies were invited. Slides were shown by the following members of the Club: Messrs. Davis, Etherington, Gibson, Kilbey, Richards, Richardson, and Wilson.

At the meeting on January 15, Mr. Cembrano in the chair, a paper on

NEGATIVE-MAKING,

by the Rev. F. C. LAMBERT, was read. Mr. Lambert dealt with the variations in the character of the negative to be obtained by modifications of the time of exposure and of the composition of the developer, and his paper was illustrated with an interesting series of negatives shown as lantern slides. It will, perhaps, not be thought hypercritical to mention that Mr. Lambert's formulae of the different developers recommended by him would have been much more easily followed if they had been given as so many grains of pyro, bromide, soda, &c., to the ounce of developer, instead of as so many drachms (or "drops" in some cases) of a solution—and that not always a ten per cent. solution—of pyro, bromide, soda, &c., to be made up with water to a certain number of ounces of developer. It was really impossible in some cases to ascertain the actual composition of a particular developer without working out an elaborate arithmetical calculation.

West Surrey Photographic Society.—January 17.—Mr. JOHN H. GEAR gave a lecture on

THE ARTISTIC SIDE OF PHOTOGRAPHY AND THE MECHANICAL SIDE ALSO showing by lantern slides how some of his well-known and popular pictures had been absolutely made: his *Silvery Moon* and *The Receding Tide*, by cutting down, suppression, and the addition of suitable skies; his *Autumn* (shown at the Royal last year), by the combination of three negatives, which were shown separately and then as the finished picture. The lecturer gave most interesting details of his various modes of working, notably of his use of ammonium persulphate for reduction, which he presented in actual progress on the screen till the film dissolved by the heat of the lantern. Incidentally he dwelt on the use of tabloids, which enabled him to bring down to this demonstration, in a case but little larger than a cheap novel, a complete chemical outfit. There was also much advice as to the treatment of the negative, and to its possible modification and correction where necessary.

Liverpool Amateur Photographic Association.—January 18, Annual Meeting.—The PRESIDENT, in moving the adoption of the reports, said the Society was one of the very few able to keep out of debt without extra subscription. Mr. J. H. Welch was chosen President for the ensuing year; Dr. Morgan and Mr. E. R. Dibdin, Vice-Presidents; Mr. R. H. Phillips, Hon. Treasurer; and Mr. F. A. Schierwater, Hon. Secretary; while, to fill the vacancies in the Council, the following were elected: Messrs. Lange, Lloyd, Leby, Deprec, Taylor, and T. E. C. Wilson. Mr. LANGE read the report of

the Judges at the Annual Competition, which drew attention to the decreased number of the exhibits, but gave high praise to the excellent quality of those sent in. The following were the results: Challenge Trophy, gold medal, Mr. T. E. C. Wilson. Class A (for set of three prints, any size or subject, open to any member of the Society), Dr. J. C. Saunders, Mr. J. Appleby, and Dr. Morgan. Class B (for set of three prints, open to any member who has not previously taken an award for prints in any photographic competition), Mr. F. C. Timpany. Class C (for set of six lantern slides, open to any member of the Society), Messrs. H. J. Houghton and J. Parkinson. Class D (for sets of six lantern slides, open to members who have not previously taken an award for lantern slides at any photographic exhibition), Messrs. C. Göstenhofer and S. Cann.

Rotherham Photographic Society.—January 16.—Mr. GRANT, of the Sandell Films and Plate Company, Limited, gave a practical demonstration of the uses of the

PERFECT PLATE AND CRISTOID FILMS.

The audience included a contingent of members of the Attercliffe Photographic Society. Mr. Grant developed four of the films, which had respectively received one second, five seconds, fifty seconds, and five minutes' exposure. The one second appeared to have been rightly timed; but, of course, the others—they were all developed in one dish—showed unmistakable signs of over-exposure. By means of a ferridcyanide reducing bath the densest of the four was made into a good negative. It was claimed that the films had advantages additional to those of the multiple film plates, and that their manipulation did not present any special difficulties.

FORTHCOMING EXHIBITIONS.

1900.

January	Huddersfield (Invitation). W. A. Beevers. Cloth Hall-street, Huddersfield.
,, 29-31.....	Southsea Amateur Photographic Society. F. J. Mortimer. 10, Ordnance-row, Portsea.
February 10-24	Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.
,, 24-March 3	Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley.
March	South London Photographic Society.
,, 26	Twentieth Century International, Birmingham. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.
,, 26-31	Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin.
April 3-7	Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

LANTERN SLIDES OF THE PARIS EXPOSITION.

To the Editors.

GENTLEMEN,—Will you please inform me where I can obtain the best set of lantern slides of the Paris Fair of 1900? I should desire about 150 to 200 of the very choicest subjects, and slides only of the highest quality.

Is it possible to get a good set about next May? Have been looking over your BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for advertisements of slide-makers, but am unable to determine who is the very best one to order from.—I am, yours, &c.,

WALTER BARRIE.

Strathelair, Manitoba, Canada.

[Perhaps some of those firms who contemplate producing lantern slides of the Paris Exposition will communicate direct with our correspondent. It is an obvious impossibility for us to give him the information he desires so far in advance of the opening of the Exposition.—EDS.]

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—Your correspondent, "Free Lance," is, no doubt, quite right in saying that grammes and metres will not be used with facility unless we think in them, but what can be done is to make people think in them by using them, and showing how much more convenient they are for accurate expression than the usual measures. Of course, no one expects to convince the true conservative John Bull, who considers that his education was completed in his school days, and that it is a sort of crime to

acquire knowledge afterwards. Photographers, however, are not in this position; they have all learnt their business later in life, and are well aware, most of them, that knowledge has not yet reached its limits. Some of them may be induced to try what is recommended in your JOURNAL, and even to persevere through the first difficulties till they arrive at the full advantage of thinking, as well as writing, in the metric measures.

I am glad, therefore, that you have urged on the teachers of the art of photography that they should use metric units in their schools. Depend on it that pupils who have been accustomed to use the convenient and certain formulae of such schools would never willingly change them for others. Of course, those who work for old-fashioned employers might be obliged to comply with the customs of their masters, but it is to be hoped that the mass of the pupils of the schools do not remain all their lives in subordinate positions, and, when free, they will probably supply themselves with metric weights and measures, unless dealers put difficulties in their way and become centres of reform in practice.

Never mind the grocers; let them sell their tea by the pound while the law allows them to do so and the public want it. If the more intellectual portion of the British public habitually use metric weights and measures, the practice will increase, and there may be some hope of compulsory, instead of permissive, use of them.—I am, yours, &c.,

J. F. T.

SIR HOWARD GRUBB'S STEREOSCOPE.

To the Editors.

GENTLEMEN,—I observe an article in the last number of your JOURNAL giving a diagram of a stereoscope which is precisely the same as that described in my paper which I think I sent you a short time since, and several of which were made. Not only the principle but the details are so absolutely similar to mine, that it is quite evident that whoever wrote it did so from a description of one of the instruments, or had seen one of the instruments themselves. I do not know who the Dr. T. R. Robinson can be except that it means Dr. Thomas Romney Robinson, of Armagh, the late astronomer there, and a connexion of my own, who left work behind him of extraordinary value, but who certainly had nothing to do with the stereoscope. From the way the article is worded, one would rather imagine that it was claimed by the Americans as an invention, but in any case you will see that it is in every respect exactly the same as that which I described in the paper sent to you. If I am wrong in thinking that I sent you one of these papers, I could send you one to look at, but only to look at, as I am quite out of my private copies.—I am, yours, &c.,

H. GRUBB.

Optical and Mechanical Works, January 18, 1900.

[We are very much obliged to Sir Howard Grubb for his letter. It was our intention this week to point out the similarity between the stereoscope attributed by the contributor to the *American Annual* to Dr. T. R. Robinson, and the instrument devised by Sir Howard himself more than twenty years ago, and described in his paper read before the Royal Dublin Society in 1878. We reprinted that paper, a copy of which was kindly sent us by Sir Howard, in the JOURNAL for June 3, 1898, and in our ALMANAC for 1900 we gave lengthy extracts from it, amongst them one descriptive of the stereoscope now attributed to Dr. T. R. Robinson.—EDS.]

FOG ON PLATES.

To the Editors.

GENTLEMEN,—In your last issue you published remarks of a correspondent *re* fog on plates, and blame the manufacturer wholly for this. I venture to differ from your conclusion, and to blame the dealers for the mischief. Last month, on commencing to use a new gross batch of plates, I was surprised to see, on development, that they were badly under-exposed, and had a black margin round, as described by your correspondent. I at first attributed the former effect to my mistaking the quality of the light, and the latter to some defect in the slide. The same thing occurring in a different slide and an excellent light, I developed a plate straight from the box, and the margin was still there. I wrote to the makers, enclosing an under-exposed plate and the batch number.

I soon received a reply, stating that the plates were made in 1896, and saying that it was only likely they would be useless by now. They also inquired the dealer's name, who they afterwards persuaded to forward me a fresh batch. They also stated that the reason the date of manufacture was not marked on each box was because the dealers are opposed to such a course.

Now, I think that the gentleman complaining must in the same way have got hold of a stale batch. Surely the members of the Royal Photographic Society and other societies could put pressure on the manufacturers to date their products. It could not do any real damage to the dealers, as no one would refuse a plate six months old, and no dealer need stock longer than that. The present system only induces carelessness on their part. I know that using old plates this Christmas was at least 5/- out of my pocket, as several of my customers were only here on a holiday, and their negatives were useless. If your correspondent would

use the slow brands of plates, I think he would get negatives similar to those produced years ago; only, would they suit the present paper generally used?—I am, yours, &c.,

H. C.

To the Editors.

GENTLEMEN,—I WAS much interested in the article in last week's JOURNAL, entitled "Fog on Plates," having had a similar experience myself.

Like your correspondent, I am an old and careful worker, and, like him, I have used the same make of plates for many years, getting a sufficient number in the spring, direct from the makers, to last me through the year, and up to last season have always found them of excellent quality. Last April I ordered my stock as usual, and, on receipt, tested a plate of each size with perfectly satisfactory results. Having some plates left from the previous year, I had no occasion to expose more of the new batch till I started for a tour in June. When I developed the negatives on my return, I found every plate of the $7\frac{1}{2} \times 5$ size more or less fogged round the edges, while the $\frac{1}{4}$ -plates, used in hand camera, were all I could desire. I took a plate from an unopened box that had been left at home, exposed and developed at once, and the result was the same.

I feel sure that the boxes were responsible for the defect. Where the edges were protected by the dividing cards the fog was not so bad, the marks made by the cards plainly showing in many instances. I think it probable that the boxes were by a new maker, as they were somewhat longer than I had ever had them before, necessitating a piece of crumpled paper being placed at one end to keep the plates from moving.

As I had exposed most of the plates, and could use the negatives by trimming the prints a trifle smaller, I made no complaint to the makers, intending to mention the matter when I send my order this year.—I am, yours, &c.,

J. TILFORD.

231, Elgin Avenue, Maida Vale, W., January 22, 1900.

PHOTOGRAPHERS IN SOUTH AFRICA—A WARNING.

To the Editors.

GENTLEMEN,—It has come to my knowledge that some photographers are contemplating leaving this country for South Africa with a view to engaging in business there.

As one who has had considerable experience of that country, I must say that no more inopportune time could be chosen than the present.

In times of peace there are very few openings for photographers, whilst at present, when most of those employed formerly in the Transvaal and Orange Free State are forced compelled to stay in Natal or Cape Colony, there is an absolute surfeit of photographic talent there.

At the conclusion of the war there is little likelihood that any one, not previously settled in the two States (now at war with us), will be allowed to enter them for some considerable time, until law and order are restored on a substantial basis, which may be a matter of years.

Under these circumstances, I think it will be allowed that it would be most unwise to embark on such a risky venture unless supplied with unlimited resources.—I am, yours, &c.,

PHOTOGRAPHERIST.

ADVERTISEMENTS—A SUGGESTION.

To the Editors.

GENTLEMEN,—I have a suggestion to make *re* your advertisements. When using a number, such as H 24, for instance, any one replying has not the faintest idea of where it is. Would it not be advisable to put the name of the town or county from which the advertisement emanates in brackets at the end of advertisement, in the same way as the *Bazaar* does? Personally, I have answered advertisements for operators in both Ireland and Scotland at different periods when I have no desire to go there. If this suggestion was adopted, it would avoid much trouble and expense to numerous subscribers who use your valuable paper. I should like to hear what your correspondents have to say if you will kindly insert this. Thanking you in anticipation,—I am, yours, &c.,

55, Market-street, Manchester, January 20, 1900. J. A. HOWARTH.

[There are practical difficulties in the way of a general adoption of our correspondent's suggestion, but we give it publicity in case individuals may find themselves in a position to utilise it.—EDS.]

STEREOSCOPIC PHOTOGRAPHY WITH ONE LENS.

To the Editors.

GENTLEMEN,—In your issue of January 19, in answer to one of your correspondents, you say that, when using the apparatus (*The Stereophoto-duplicon*) described in your Almanac two years ago, the views are reversed. Such a statement is not correct, and, lest any of your readers may have a wrong impression as to the action of this instrument, it should be said that the *Stereophoto-duplicon*, now being supplied by Mr. J. Fallowfield of Charing Cross-road, transposes the two views in the camera, but does not reverse them, the result being that both views are taken in their correct position, and the negative obtained may be printed from direct. This is a very great advantage, as no mistake can possibly be made by the inexperienced stereoscopist when printing from his negatives or mounting them.—I am, yours, &c., THEODORE BROWN.

DIRECT POSITIVES IN THE CAMERA.

To the Editors.

GENTLEMEN.—The process patented by Messrs. Thornton and Rothwell, published in your issue of January 12, for producing positives direct in the camera, appears to me to be nothing more nor less than the old and original method of taking positives direct on glass, which was the only method in use when collodion was first introduced, back in the fifties, for photographic purposes. At this time the process was entirely confined to taking positives on glass, and it was some few years later before it was discovered that, by prolonging the development with the iron developer, and afterwards intensifying with pyro and silver, the positive was converted into a negative from which positive prints could be obtained *ad libitum* by placing sensitised paper, plain or albumenised, in contact with the negative, and exposing it to sunlight. This same method of printing is continued to the present day with hardly any alteration or improvement beyond the substitution, to a large extent, of P.O.P. for albumenised paper, and, in the manufacture of plates, gelatine for collodion.

In producing positives on glass, the development was carried no further than was necessary to render visible the high lights of the picture, the half-tones and shadows were quite invisible, and no detail was apparent until after the fixing solution (cyanide of potassium) was applied, and even then the deposit was so thin that very little detail could be seen by transmitted light. But, when the plate was backed up by some dark opaque substance such as black velvet, black paper, or black opaque varnish, either of which was then used for the purpose, a brilliant positive picture with beautiful gradation of tone and all necessary detail was the result. A bleaching effect was also produced by the addition of hydrochloric or sulphuric acid to the developer, the exact formula for which I cannot at present remember. The picture was backed up sometimes on the collodion side, and sometimes on the plain glass side of the plate. If on the collodion side, the image was seen through the glass in its correct position as a positive picture, but, if on the plain glass side, it was seen as a positive picture reversed, or as a person would see himself in a mirror. The latter method was generally resorted to when the picture had to be coloured either in oil or water colour. I have seen some very pleasing effects produced by tinting on the collodion side of the picture with dry powdered colours, and in other cases by a more pronounced colouring which, seen through the picture, has an effect somewhat resembling crystoleum.

The only difference I am able to discern between the method above described and that patented by Messrs. Thornton and Rothwell is that the latter have substituted a flexible film for that of glass for taking the impressions.—I am, yours, &c.,

THOS. MITCHELL.

Newport, January 22, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

Edith Weston, 23, Sandgate-road, Folkestone.—Two photographs of Colonel John Denton Pinkstone French.

RECEIVED.—W. WILKINSON; G.; BURETTE; R. T. WALL; EXCELSIOR; CINEMATOGRAPH; and others. These will be answered in our next.

H. A. WASSELL (Stourbridge).—We are sorry that we have no information to add to that already given.

FOREIGN VIEWS.—E. SEAMAN asks for a likely firm where he can obtain the following foreign views: Königswinter, Andernach, Marksberg Castle, near Braubach?—In reply: Possibly of Spooner's, Strand, London.

M. PELLECHET.—The original film is, we believe, hardened in the method of preparation, the precise details of which are not published. But, according to that method, we do not think the expansion can be obviated.

H. F.—We can only reply to you in general terms, as it is strictly against our rules to make particular recommendations of the nature suggested. All the instruments named are of high class. We suggest that you make your choice by practical trial.

Z. Y. Z.—Of our own experience we cannot give such a formula. What we suggest is that you should try one of the "gaslight" development papers that produce the colour as directed in the instructions, viz., by modification of exposure and development.

GOLD SOLUTION.—R. BAINES says: "What is the reason that, when I recently dissolved a fine grain tube of chloride of gold (Johnson's) in two ounces of water, it at once changed colour, and now there is a dark sediment at the bottom of the bottle? The sulphocyanide bath made with it will not tone at all?"—The reason is that either the water was impure or the solution was made in a dirty bottle, and all the gold has been precipitated.

BENZO (Cardiff).—1. The print is apparently on Nikko paper. 2. We do not know of such a machine which is obtainable commercially. The one you indicate is obviously for a larger size than quarter-plate. Try small advertisement in our outer pages. It would probably bring you the information you desire.

ILLUMINATED ADDRESSES.—R. MEREDITH wishes to know "if there is a firm anywhere producing illuminated addresses by machinery, where sample and designs can be obtained, as he wants to lay them before a committee to choose their design and prices from?"—In reply: Probably some such firm as Waterlow's, Finsbury, or Bemrose, Derby, would supply our correspondent with what he requires.

REPRODUCTION FEES.—MAGAZINE says: "I supplied two 10×8 views to a firm to put into a magazine before Christmas. Should be glad if you would give me an idea of what is the usual reproduction fee, as they say they are prepared to pay this."—In reply: The minimum fee recommended by the Photographic Copyright Union is 10s. 6d. In the case cited by our correspondent a guinea each picture might be charged.

OFF TO THE WAR.—WAR writes: "I saw in your JOURNAL of the 5th of last month 'The Possibility of the Camera in regard to the War.' I should like to go. Do you think it would be worth while, and, if so, what would be the best means of doing so?"—In reply: The only suggestion we can make is that our correspondent should endeavour to obtain an engagement as photographer-correspondent of a newspaper—that is, i should think it worth his while to go. We do not.

AGREEMENT.—OPERATOR writes: "I am offered an engagement for a year certain from March 1; should the agreement for the year be in writing or binding on the employer, because I have heard of cases where an engagement for a year has been made and the operator discharged when the season is through? Your advice will be gratefully received."—To make the agreement binding it must be in writing, and see that you have it before you enter the service. The agreement must also be stamped—a sixpenny stamp.

DRY-PLATE MAKING.—W. BEAL says: "I have made some dry plates according to a formula given in one of the old ALMANACS, and they are fairly good, though slow; but the film is covered with depressions from the size of a small pin's head to a small bead. Can you suggest the cause?"—Doubtless the depressions are what are known as "pits." If so, they are due to the employment of an unsuitable kind of gelatine. Some brands of gelatine are very prone to this defect. Try Heinrich's or Simeon's photographic gelatine next time.

COLLODIO-CHLORIDE PAPER.—J. H. C. writes: "How long should collodio-chloride paper keep in good working condition? I had some of —'s, and it had not been in the house a fortnight before it had gone quite a light brown, more on the back than on the front. On complaining, I was told that I had not kept it properly, though it was stored in the case it was received in."—The paper would not have gone brown in so short a time, if carefully stored, unless it had been faulty in its make. This rather seems to be the case, as the back has changed more than the sensitive surface.

DETENTION OF NEGATIVES, &c.—H. H. says: "About a month ago I sent a negative and remittance to an enlarger, ordering an enlargement, and have written to him several times, but cannot get either the enlargement or negative, or any reply to my letters. Kindly let me know the best way to proceed to recover the amount sent and the return of my negative. Can I take action through the County Court?"—In reply: Your remedy, we think, would lie in the County Court. You should also communicate with the local Superintendent of Police, as people of this sort deserve to be made an example of.

RESTORING A DAGUERREOTYPE.—J. CHRISTIE says: "Will you inform me if a very old Daguerreotype, taken forty-six years ago, and which has both faded considerably and become scratched and spoiled, possibly through damp, can be restored to some extent? If you can also furnish me with the name and address in London of an expert in this class of restoration, I should feel obliged."—We have never yet seen a faded Daguerreotype. They tarnish, and that can be cleaned off; but there is no means by which the scratches can be removed. Any of the old photographers who are familiar with the Daguerreotype process will do the work for you.

GETTING PLATES THROUGH THE CUSTOMS.—F. J. P. says: "Can you give me any information as to the best way to get my undeveloped plates through the Customs offices at Calais on outward journey, and at either Dover or Newhaven on return? As I am carrying rather a large number, I propose taking them in a box (into which they exactly fit) quite separately to other luggage. They will be packed in Newman & Guardia's refil boxes, on to which will be pasted the label of the plate-maker. Any suggestion you can make I shall be grateful for."—You will experience no difficulty if you explain at the Customs houses what the packets contain. If you do not speak French, it will be well to have a label on the boxes in French, that the plates will be spoilt if exposed to light. The makers of the plates will, doubtless, supply the labels.

EYE TROUBLES.—OMEGA asks: "Can you inform me of any lotion that will strengthen the eyes? I may say my eyes are somewhat weak. They are subject to water, which is very uncomfortable, especially when retouching, or, when my eyes are fixed on an object for length of time, they become weakened. My eyesight is very good. I can readily perceive an imperfection of the smallest form at a distance or close at hand. If you can give me some information, I shall be much obliged as I detest the wearing of spectacles."—You may think your eyesight is very good, but there is little question that you require suitable spectacles and our advice is to lose no time in getting them, also to have them fitted by an oculist. A dilute solution of sulphate of zinc is sometimes used as a lotion for the eyes, but we should not recommend you to use it without advice.

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EX CATHEDRA.

At the Annual Meeting of the members of the Royal Photographic Society, on Tuesday evening, February 13, Mr. T. R. Dallmeyer, F.R.A.S., will be declared President of the Society. The nomination paper does not contain the name of any other candidate for the office, and thus the election takes place as a matter of course. Mr. Dallmeyer has been a member of the Society since 1886, and a Vice-President since 1894. In 1896 he was awarded the Society's progress medal for his work in stereophotography. Besides contributing many papers on optics to the Society, he has always manifested a strong practical interest in its progress. The new President, whose election will undoubtedly be popular with the members of the Society, has our heartiest congratulations on his accession.

* * *

A CORRESPONDENT sends us a print recently made on bromide paper thirteen years old. The date on the package is 1886. Except for some marks of staining round the edges, due in all probability to the method of development adopted, the print is of very good quality. We often have mention of instances in which sensitive dry plates have been found to retain their

original good qualities unimpaired for many years; but data with regard to bromide paper are not so plentiful. The case we are quoting probably constitutes a record.

* * *

A MEMBERSHIP of over sixty, at the end of only a year's existence, is a fact of which a newly formed photographic society may justifiably be proud. The Redhill and District Camera Club finds itself in this happy position. It has a good balance in hand, and an excellent programme of papers and demonstrations has been arranged for future meetings. On its executive we see the names of many photographers of the highest skill and reputation. Mr. William Brooks, the new President, has had over forty years' experience in photography, which, with his fine practical knowledge of all branches of work, should be of immense service to the Club. Mr. Ralph Robinson, Mr. J. O. Grant (late of the Hackney Society), and Mr. Henry Speyer (the very able Alpine photographer) are also active members of the executive. The Club's recent lantern lecture, delivered by Mr. Speyer, was remarkably successful. The Redhill Club appears to have a prosperous future in front of it, and we wish it the utmost success in spreading a knowledge of photography in the beautiful county of Surrey.

* * *

WE have already drawn attention to the fact that the war is adversely affecting most branches of photographic manufacture and production. Its evil influence, it appears, extends even so far as the Exhibition of a photographic society. We are asked to note "that the Woolwich Photographic Society has decided to postpone their annual Exhibition until the autumn, on account of the large number of members and supporters engaged in the Royal Arsenal having to work overtime, and who are therefore unable to prepare pictures or assist in any way."

* * *

WE have received the first number of *British Invention*, a weekly review of patents, improvements, and developments, which is published at 55 and 56, Chancery-lane, W.C. Its scope is sufficiently indicated by its title. There is an interview with Mr. J. Fletcher Moulton, Q.C., M.P., the eminent

authority on British invention, in the course of which that gentleman gives his ideas on the subject of patent law reform. We have only space for one extract: "Mr. Moulton would simplify patent law by the removal of certain grievous difficulties, some of which were provided for in the Bill which he presented to Parliament in 1895, but which, like most private members' Bills of that time, was sacrificed to make way for public or Government measures. On the vexed question of official examination of applications, for novelty, by the Patent Office, Mr. Moulton is in accord with those who know most of the actual working of the present system. He believes in free trade in patent grants, provided only that publicity for opposition, as now existing, is given to the applications before they are sealed." That the actual working of the present system of Patent Office procedure should receive support from Mr. Moulton is matter for surprise. The office takes an inventor's fees readily enough, but gives him in return nothing which can reasonably be called protection. Reform in our patent laws urgently called for.

* * *

A MEETING of the Council of the Photographic Convention of the United Kingdom was held in London on Thursday, January 25. The arrangements for the Newcastle-on-Tyne meeting were discussed. It will be held in the week commencing Monday, July 9, and there will be excursions to Durham, Alnwick, Hexham, &c. Considerable other business concerning matters of detail was transacted by the Council, vacancies in which body were filled up by the election of Messrs. H. Vivian Hyde, S. Herbert Fy, W. E. Dunmore, and J. Pattison Gibson.

* * *

AT Maidenhead last week there was a town's procession in aid of the War Fund. In the description of the proceedings a local newspaper had a paragraph about a camera-maker's car, provided by Mr. W. Allen, a photographic apparatus maker in the town. The car was said to be most appropriate to the exhibitor's trade. At the rear of the vehicle, and at the back of a huge camera, we are told, there was a large illuminated photograph of Lord Roberts, whilst specimens of cameras were exhibited. A couple of men were at work, and circular saws were in motion. This is the first time, to our knowledge, that camera-making has been illustrated in a public procession.

* * *

WE clip the following advertisement from a contemporary: "Your own photo. Fifty for 1s. Postage 1d. extra. Copied from any size photo. Delivered following day. Size $1\frac{1}{4}$ inches, with adhesive back. Just the thing for your memos and cards. Best finished and cheapest in the world. Your photo returned uninjured. Crossigraph Copying Company, 25, Lime-street, Liverpool." We hope the Crossigraph Company find that they can do business at a profit on these terms, which are low enough in all conscience. Hitherto a dozen small photographs for a shilling was considered cheap enough—but fifty! What next?

* * *

MESSRS. TAYLOR, FOXALL, & Co., 98, Lewin-road, Streatham, inform us that they have just made an enlargement in bromide of a somewhat unusual size. It is nineteen feet four inches by twenty-eight inches, and on one piece of paper. Messrs. Taylor say: "So far as our experience goes, it is the largest ever

made in one piece. We should be very glad and interested to know if it is the largest bromide enlargement made. Perhaps readers of the JOURNAL may be able to inform us."

SIZES IN PHOTOGRAPHS AND THE COVERING POWERS OF LENSES.

PHOTOGRAPHERS have often expressed disappointment that lenses said to embrace an angle of so many degrees on a plate of such and-such dimensions do not do so, although, as a matter of fact they do. But it must be explained that the optician and the photographer usually consider the angle in different ways. The latter often expects that it means on the base line of the picture, whereas the former means on its diagonal, the correct way when speaking of the covering power of a lens; because the same lens will include as well a wider angle on the base line, if we use a longer plate and at the same time curtail its width, so that the diagonal still remains the same, and this it does without reducing its aperture.

How the present standard sizes in photography came to be adopted it is difficult to conceive. In the old Daguerreotype days there were the following sizes: the one-ninth, the one sixth, the quarter, the third (5×4), the half, and the whole plate, and these sizes remain unchanged up to the present time. The next larger sizes, adapted for calotype negatives, were 10×8 , 12×10 , 15×12 , 18×15 , and 22×20 , and these are still in vogue. Why they were fixed upon it is equally as difficult to surmise, seeing that they are so erratic as to their proportions as regards length and breadth. The camera-manufacturers have always supplied cameras for those sizes, and the opticians catalogue their lenses to suit them.

In later years the *carte-de-visite*, the size of which is about three and a half inches by two and a quarter, the cabinet which is from five and a half to six inches by four, and afterwards the seven and a half by five size were introduced. Some of the old workers affirm that the great success of the *carte-de-visite* and cabinet portraits was largely due to their pleasant proportions, and, for the same reason, they say the $7\frac{1}{2} \times 5$ size found so much favour amongst amateurs. Now it will be noticed that in all of these favourite sizes the picture is just about one-half longer than it is broad, and it will be found that these proportions, to about one-third longer, according to subject, obtain in most paintings and engravings.

Now, let us look at the proportions of these standard photographic sizes and see how inconsistent they are with one another. In the first place, although the quarter-plate is really a quarter of the whole-plate, the half-plate is larger than half a whole-plate, being half an inch wider, and consequently is squarer in shape. Then the 12×10 , that, like the whole-plate, is two inches longer, only, than it is wide; but the proportion of the latter is, roughly, one third longer than its width, whereas the former is but one-fifth. If the one is a pleasing shape, it is clear that the other is not. If we take the next two sizes, we see that that the 15×12 is one-fourth longer than it is in width, while the 18×15 is but one-fifth longer, another discrepancy. Then, coming to the largest size we have quoted, namely, 22×20 , we find but two inches difference between the length and breadth, just the same exists in the whole-plate. Here it will be noted that the length of the plate is but one-tenth more than its width—almost a square—while the cabinet size and the $7\frac{1}{2} \times 5$ is one half longer.

Let us next consider the covering power of lenses, with reference to the size, or, rather, the proportions of the plates. The field of a lens, as is well known to our readers, is a circle, and it follows that it will cover any size or shape that can be cut from that circle. Take, for example, the 12×10 size, which in trimming for mounting is usually very considerably reduced in its width, its diagonal is fifteen and a half inches; it follows, therefore, that the lens that will cover 12×10 will also cover a plate of any other proportions that can be cut out of a circle the diameter of which does not exceed the fifteen and a half inches; one, for example, $13 \times 8\frac{1}{2}$, and these are about the same proportions as the cabinet picture. Of course, a picture with these proportions includes a much wider angle, the base line, than is the case with the 12×10 when the same lens is used on that size plate.

Next let us take the 18×15 . In this the length exceeds the width by only one-fifth, and its diagonal is twenty-three and a half inches. Here we can get a 20×13 -inch negative of our lens, and these again are about the same proportions as the cabinet picture; we also obtain a correspondingly wider angle on the base line of the picture. Let us finally look at the largest size to which reference has been made, namely, the 22×20 . How these proportions came to be adopted it is still more difficult to speculate upon, but see we the size quoted in an old catalogue of the late Andrew Ross, in the fifties, and we find it also adhered to in the latest catalogue of Dallmeyer, notwithstanding its ugly shape for a photograph, as it is almost square. Any lens that will cover that size plate will quite as well cover one 24×18 , or one 25×17 , and here again we get nearly as possible, the same pleasing proportions as in the favourite cabinet size, and, as a matter of course, a much wider angle length-wise on the plate, or as the photographer usually judges the angle of view. Some have imagined that to take a negative on a plate 24×18 a lens the next size larger to the 22×20 is required. That is not so, as the lens that will cover the latter size will cover the former equally as well, indeed a trifle better.

It is not to be expected that the sizes and proportions that have been in vogue for cameras, &c., since the earliest days of photography are likely to be altered now. Our object here is simply to point out, to those who may not be aware of it, that the lenses they have may be used on plates of different proportions from those they are catalogued by the makers to cover as to include a wider angle, in the direction usually desired, without in any way curtailing definition throughout the field, and at the same time secure more suitable shapes for the majority of subjects.

Formalin and Gold.—The extent and variety of uses to which formalin may be put is remarkable, and continues to increase. L. Vanino, in a foreign journal, has pointed out its extreme usefulness for precipitating and assaying gold. He says gold can be estimated quantitatively by adding ordinary commercial formalin to the solution of the chloride, and afterwards a few drops of caustic soda, and the whole heated for a few moments on a water bath. The metallic gold is separated by filtration, and the filtered liquid then tested by formalin to make sure that the precipitation is complete. The precipitated gold is washed with water, then with alcohol, and dried at 180° , or even heated to redness on a crucible. Formalin will throw down silver from its solution in nitric acid, whether heat be applied or not. Chloride of silver, also, is reduced by formalin, the reaction being capable of application not only in qualitative, but in quantitative, work, and the preparation of pure silver from residues.

Eclipse Arrangements.—It is stated that the Spanish Government are making every arrangement for the successful reception of those astronomers who may go to Madrid to observe the eclipse on May 28. According to Reuter a better station than that city will be found at Naval-Moral on the Caceres line and about 200 kilometres from Madrid, the period of totality there amounting to two minutes. We have already referred to the British Association's arrangements, which will, on the whole, meet the views of most of the possible observers, for if, as the Iron Duke once said, "an army marches on its belly," so also must even a photo-astronomer conduct his observations under similar needs, and the question of hotel convenience must be considered.

A New Photographic Photometer.—In the *Astro-physical Journal* Dr. J. Hartmann describes a new photographic photometer he has invented for the purpose of determining stellar and other magnitudes as at the Potsdam Astro-physical Observatory. In instruments hitherto constructed the drawback has been the distances by which the standard scale and the object to be measured were separated. Dr. Hartmann has obviated this by conveying an image of each, side by side, to the eye by a special microscope, which might be termed a binobjective, in opposition to binocular, as it has two object-glasses which are directed respectively upon the standard and the object, the images being then sent into the one eyepiece after being reduced in size by being partially covered by screens with small apertures.

Water Purification.—The purification of water, whether from rivers or wells, is a subject of perennial interest to photographers, as there are cases where grave mishaps have resulted from the use of impure waters. Possibly the need for freedom from organic impurities is less urgent than it once was, but that the freer water is, both from organic matter, vegetable or animal life and mineral salts, the better it is for photographic purposes may be accepted as a fact. Permanganate of potassium and lime have long been looked upon as the best substances that could be used with simple appliances; but they are open to the objection that they leave free alkali in the water, and small quantities of lime, that being the alkali most frequently present, would utterly ruin the water for photographic purposes, and render it entirely unfit for potable use. In the French *Journal of Pharmacy and Chemistry* it is pointed out by M. Tixier that these difficulties can all be got rid of by using permanganate of aluminium and permanganate of barium in various proportions. With waters containing calcic sulphite the two salts would be used, while in the complete, or almost complete, absence of lime, the aluminium permanganate would be employed. M. Tixier states that the reactions entirely take place in the cold, and that the quality of the water may virtually be instantaneously ascertained, or, at any rate, always within five minutes of the addition of the first drop of the reagent.

Estimation of Sulphite and Hyposulphite of Soda.—In an article which is too technical for these pages, but which can be seen translated in full in last week's *Chemical News*, full details are given for the estimation of sulphhydric, sulphurous, and hyposulphurous acids. The methods are mainly founded on the disengaging the acids, and passing the vapour through a series of wash bottles containing iodine in solution, with a final one to hold decinormal hyposulphite solution to absorb any traces of iodine that might be carried over. The details of the method show how to test for sulphite in the presence of hypo, and for hypo in the presence of sulphite. Such tests as these will be of increasing usefulness, seeing that in the growing refining of photographic methods great purity in the raw materials in common use is most desirable.

THE PHOTOGRAPHER'S YEAR.

FEBRUARY.

FEBRUARY is a peculiar month. Nothing of much importance seems to have happened in it. St. Valentine's Day, it is true, falls in the middle of February, but even the observance of that festival is rapidly dying out.

Fortunately Shrove Tuesday also comes in. This will act to a degree as a preservative of interest, for the ordinary Englishman loses grip less readily of an excuse for eating than anything else.

The reason for the general lack of interest in the month probably is that it comes between two seasons. The sharpness of winter has gone by, and the freshness of spring not come. This year there has not been much sparkle about the length of winter that has gone by. Snow, ice, and clear frosty air have not been so much to the front. But, if in such spots as Davos, to which people journey for their particular sake, and normally with the certainty of enjoying them, they have failed, we stay-at-homes must surely grumble the less.

The old saying has it:—

“ February fill the dike
Either with black or white;
If it be white, it's the better to like.”

But the month of late years has certainly not been a wet one; on the other hand, dry and sunny. Possibly this has been due to there not having been any heavy snowfall in the preceding months, for melting snow, like rain, will fill the dike. The old rhyme, too, was made in earlier days of indifferent drainage. Science has modified in many directions the homely sayings of our forefathers, and this may be one instance; but, whether full dike and flood or otherwise, there is an evident deadness about February. Fortunately, in such circumstances, it is the shortest month. As, however, it must be passed through, better philosophically make the best use of it. It will thus be still further shortened. Things are not quite so bad as this, though; there are many possibilities open. The lengthening days naturally strengthen photographic interest. Things look very different under similar amounts of increasing and waning light. There is none of the accumulated haze and fog of the year that marks the latter to qualify the former. Objects, if bare and lifeless, look clean and clear cut. It is a phase of nature that lends itself readily to photographic record. A view of a favourite bit of landscape taken in February, apart from its intrinsic value, would act as an excellent foil to one of the same spot taken in June or July. The one has everything at its barest, the other at its fullest life. In the closer realisation of the marked difference thus graphically shown, it is also not unlikely that, in many cases, thoughts may rise above the mere fact of the difference to its causes, and the thinker be mentally broadened in deeper grooves than mere artistic or photographic ones.

But, if bare hardness and lack of life in general be the characteristic tone of February, there is a particular life dependent upon these special conditions. In much the same fashion that the death of the leaves in the autumn is an essential condition of the life of the following spring ploughing and harrowing go on. Here is a chance for a capable man—capable not merely in the sense of being able to turn out a creditable picture of the ploughman, plough, and horses, but of turning it out showing the worker intent upon his work, and nothing else, the horses moving, the ridge turning over, and “the dusky thieves, the rooks,” following in search of worms. The motion is slow enough for an instantaneous exposure, even at this time of the year; and under such conditions the result would be far better than with the usual careful posing, and the evident perspective pint of beer in the ploughman's face.

The sap in trees being at about its lowest in this month makes it the best for tree-felling. Wood-cutters, timber wains, and strings of horses are items that lend themselves well to the making of a picture. Artists of repute have found them such; the photographer need not hesitate to try his hand.

The foregoing are offered not in any strained, exhaustive fashion, but scrappily, to the acknowledged end of showing the practicability, advantage, and pleasure of keeping the camera steadily employed throughout the year. The town dweller need not fight shy of work in the month from the fact that the subjects suggested are country ones. There is plenty of material to his hand if he have not the opportunity of going to the country—winter portraiture, for instance. The portraits we have of our friends, sweethearts, wives, and children are generally summer ones, of the straw-hat and muslin type. And very naturally so, for thoughts turn far more readily to being photographed in summer than in winter. The doing so under summer conditions is also very much easier. But we undoubtedly lose a great deal in allowing ourselves to be over-dominated by photographic best conditions. Thought as a consequence does not turn naturally and easily to the taking of a desirable picture when photographic conditions are some way from being at their best. Friends in shooting and hunting dress look well. So do children wrapped up to meet the cold. If we do, or did, “any of our sweethearts in winter, remembrances of sweethearts and wives in sealskin cap and jacket are sure to have been pleasantly preserved upon the tablets of the fancy. There is, too, a

piquant air, begotten of clear cold, about the face and attitude in winter that is lacking under the conditions of summer, particularly of summer in a studio, in the afternoon.

February, as the dullest month in the housewifely calendar—for the Christmas decorations have been taken down, and spring cleaning has not commenced—would probably find the women folk in the best humor to meet the suggestion of being photographed in winter dress. Let the hesitating doubter try it. Let him aim, say, at a picture of his most dearly beloved about to start for an afternoon's skating. Dressed in an appropriate style, with the skates hanging over her arm, she will present the happy suggestion of anticipated pleasure and rapid motion a picture quite as pleasant as, if not pleasanter than, one under more languorous summer conditions. If there be no ice, and no skating, there are plenty of other distinctive winter requirements.

Many a would-be worker will be in the unhappy position of having to attend exclusively to his business during the hours of daylight. Evenings at this time of the year are long and hang heavily. The festivities of Christmas and the New Year have gone by. The fare at the music-hall and theatre, from reaction, seems insipid and not over-nourishing. The introduction of paper that prints, and can be developed by gaslight, should prove a boon to his wearied soul, if it be a genuinely photographic one. He can try at his ease and comfort any number of experiments with summer negatives. They need not run in the drier channels of mechanical manipulation, but can find expression in an artistic one. Local brush development may be instanced as one. A perfect negative is great rarity; and it need not follow that even a perfect negative will yield a perfect print. These truisms are not quoted for their own sake valuable—but a trifle stale—though they be, but to emphasise the fact that by local brush development a perfect print can be got from a negative imperfect as a whole. Undesirable portions in a print from such a one can be easily left undeveloped, and, with a little practice, the desired portion so shown as to make a very different affair of the finished result to that obtained by any of the alternative methods of blocking or vignetting, &c.

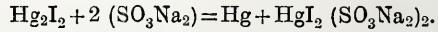
But enough, it is trusted, has been said to at least give the stimulus to individual thought to the working out of the photographic possibilities of the present month of February.

MODERN INTENSIFIERS FOR GELATINO-BROMIDE PLATE AND THEIR EFFECT.

[Translated from the *Photographische Correspondenz*.]

AMONGST intensifiers in practical use for gelatino-bromide plates, which form a black deposit upon the negative play a very important part as they offer the greatest facility for judging the strength of the image.

Of the old intensifiers of this sort, that formed by a mixture of bichloride of mercury and bromide of potassium, followed by sulphite soda for blackening the image, has been justly popular for portraits and landscapes. A new method of intensification with iodide of mercury and sulphite of soda has recently been introduced by Lumière Frères Seyewetz, of Lyons. This consists of a solution of one part of iodide of mercury and ten parts of anhydrous sulphite of soda in 100 parts water, and the negatives, after fixing and washing, are immersed therein. By reciprocal action of the iodide of mercury and the silver, a dark deposit of mercurous iodide is formed ($2\text{HgI}_2 + 2\text{Ag} = \text{Hg}_2\text{I}_2 + 2\text{AgI}$), which latter is converted to mercury and iodide of mercury by the action of the sulphite, according to the following formula given by Lumière Seyewetz:—



The negative is then washed and treated with alkaline pyro, hydroquinone, para-aminophenol, or some other developer, to blacken the image. The iodide of silver is reduced to silver and the negative rendered permanent.

Another new intensifier has also been recently introduced by the Berliner Actiengesellschaft für Anilinfabrikation under the name “agfa intensifier.” This method has been worked out by Dr. Andrese of Berlin, and his assistant, Dr. Leupold, and depends upon the use of double salts of sulphocyanide of mercury. The intensifying solution is sold in a colourless, concentrated form, which has to be added to nine parts of water for use. The gelatino-bromide plate after being fixed and washed is immersed in this solution. The intensification proceeds gradually, and the deposit is of greyish-black colour. By prolonged action great intensity may be attained, even more than with bromide of mercury and sulphite of soda. The agfa intensifier does away with the separa-

blackening process, and this is not only a simplification, but it also permits of the effect of the intensification being more readily controlled than is the case when the image has to be blackened by a separate operation. The agfa intensifier is excellent, and the question which now arises relates to the effect of this and Lumière's iodide of mercury intensifier in comparison with the older method with bromide of mercury and sulphite. For this purpose I have made a series of measurements of opacity, as described below, by means of Hartmann's micro-photometer. Gelatino-bromide plates were used, and, after exposure by means of a Scheiner sensitometer, developed with ferrous oxalate and fixed.

1. I wished in the first place to ascertain by measurement the difference between the action of the ordinary mixture of bichloride of mercury and bromide of potassium (1 part of bichloride of mercury, 1 part of bromide of potassium, and 50 parts of water) and a solution of bichloride of mercury (1 : 50). The test plates were exposed with the Scheiner sensitometer. The bleaching of the silver deposit was much slower with pure bichloride of mercury than when it was mixed with bromide of potassium, and the subsequent blackening of the image was much more intense where bichloride of mercury and bromide of potassium were used, as compared with bichloride of mercury only. The latter did not intensify very appreciably. Both processes showed some loss of density in the finest shadows after prolonged action of the sulphite of soda (evidently due to the solvent action of sulphite of soda upon silver chloride and silver bromide; but, as the former is much more soluble intensification is less).

2. Lumière's iodide of mercury intensifier blackens the negative slowly and continuously, and the colour tends to a brownish shade which becomes rather more pronounced by subsequent washing. The treatment with a developer, according to instructions (pyro soda was used), darkens the image, but insufficient washing after intensification gave rise to slight red fog, which was inconvenient. Intensification is, however, very full, and more density is obtainable than with bromide of mercury and sulphite.

3. The agfa intensifier is preferable to Lumière's, because there is only one solution, and there is, moreover, no risk of red fog, as in the case of Lumière's intensifier, if the plates be insufficiently washed. Density can be pushed very far with agfa. In this respect it surpasses the bromide of mercury intensifier, and is nearly equal to Lumière's.

The following table gives the numbers of the opacities of the strips of the intensified plates:—

Table of opacities of dry plates after use of different intensifiers:—

Exposure in candle metre seconds.	Opacities of negative before intensification.	After intensification with bichloride of mercury and sulphite of soda.	After intensification with bichloride of mercury & bromide of potash and treatment with sulphite of soda.	After intensification with Lumière's iodide of mercury intensifier.	After intensification with Agfa.
1·0	0·36	0·32	0·33	0·37	0·37
1·26	0·41	0·35	0·39	0·43	0·43
1·60	0·47	0·40	0·45	0·52	0·55
2·05	0·51	0·45	0·57	0·63	0·72
2·61	0·64	0·57	0·71	0·75	0·90
3·3	0·73	0·68	0·87	0·93	1·10
4·2	0·80	0·77	1·07	1·18	1·31
5·4	0·87	0·87	1·27	1·40	1·50
6·9	0·97	0·97	1·47	1·65	1·70
8·8	1·07	1·09	1·69	1·89	1·85
11·2	1·18	1·20	1·85	2·03	1·94
14·3	1·32	1·34	1·98	2·15	2·00
18·2	1·41	1·47	2·07	2·27	2·19
23·2	1·48	1·55	2·12	2·33	2·28

It follows from these observations that the old method of intensification with bichloride of mercury and bromide of potassium, followed by blackening with sulphite of soda, is sufficient for most cases, and is still to be recommended. But the agfa intensifier, from its simplicity and its greater power of intensification, seems superior, and is doubtless an improvement.

DR. J. M. EDER.

PYROXYLINE.

Of all the articles used in photography, probably none is so difficult and unpleasant to manufacture as pyroxyline. Certainly it is not so important now as in the early years of photography, although it is still largely used for enamelling and collodio-chloride emulsions.

The writer has tried numerous samples by different manufacturers, all of which vary more or less. This partly shows how difficult a matter it is to lay down a definite formula for its manufacture, and how intricate the manufacture is. Not only are there great variations in the quality of commercial pyroxylines, but the variation in price is quite as great, ranging from 9s. to 40s. per pound.

The literature bearing upon the subject of its manufacture is of a very limited nature. The only works which contain any exhaustive treatises upon the matter with which the writer is acquainted are Hardwick's *Photographic Chemistry*, Abney's *Instruction in Photography* and *Photography with Emulsions*, and Leaper's *First Principles of Photography*; and, by reason of the enormous varieties of pyroxyline which can be manufactured, hardly any two formulæ agree, for every variation in the quantity or quality of the acids, and every degree of temperature at which it is made largely affects the solubility and other properties of the resulting pyroxyline.

Pyroxyline is what is chemically known as a nitro-cellulose, varying from the highly explosive and almost insoluble gun-cotton to the beautifully soluble high temperature. The explosive varieties differ very slightly in appearance from the original cotton, and from six to ten grains per ounce of ether-alcohol form a thick and glutinous collodion of a very contractile nature and slightly yellow colour, while the high-temperature variety forms a limpid collodion, even with twenty grains per ounce, giving a film which is non-contractile, almost colourless, and rather rotten, while that given by the low-temperature is strong, tough, and contractile, and, when quite dry, can neither be developed nor toned.

Pyroxyline is made by immersing any form of cellulose (usually the finest cotton-wool) in a mixture of sulphuric and nitric acids at any desired temperature according to the kind of pyroxyline required.

As Hardwick advises in his *Photographic Chemistry*, when starting to manufacture pyroxyline, a carboy of each acid and a good stock of cotton-wool should be obtained, as any variation in these articles causes a change in the pyroxyline.

Cotton-wool, as obtained commercially, is generally somewhat greasy, and in this state the acids do not act upon it properly, so the first necessary stage in the manufacture is to boil the cotton in a weak solution of soda or potash. One of the most reliable tests of the freedom from grease is, as Captain Abney says, to drop a piece of the dry cotton upon cold water. If it contains grease, it will float; but, if free from grease, it absorbs water and rapidly sinks. Before proceeding further, the cotton must be thoroughly dried. A very good and rapid method of doing this is to hang a sheet horizontally by the four corners, distribute the cotton well over it, and, especially if it stands in a draught, the cotton will dry very quickly. The next process is to remove the little brown specks which are found even in the best cotton-wool. The kind of pyroxyline required must be decided upon before starting, as the temperature must be studied, and this also regulates the strength and relative quantity of the acids, for, strange though it may seem, the higher the temperature required, the stronger must the acids be, or the cotton will dissolve. In using acids it is generally found that the application of heat to the acid largely helps to dissolve the article immersed therein, and in making pyroxyline the action of heat has a very peculiar effect, for, with an acid mixture which is very successful for a certain class of pyroxyline, an increase of heat will tend to dissolve the cotton, but, if the acid mixture be made stronger, the cotton does not dissolve, but instead makes a more soluble pyroxyline. Hardwick, in his *Photographic Chemistry*, gives a temperature of 140° F., but at that temperature, with the proportion of acid that he gives, the writer has been unable to get anything but a tough and contractile collodion. This may be accounted for by the difference in the quality of the acids, as, for economy's sake, the writer has been in the habit of working with ordinary commercial sulphuric acid of specific gravity 1·813, and nitric acid specific gravity 1·42. The mixture of these with water gives in his hands a temperature of about 190° F. against that given by Hardwick of 165° to 170°. The resulting collodion was very tough, contractile, and left a heavy flocculent deposit, the mixture apparently not containing enough nitric acid, as this seems to be the principal element in the conversion of cellulose into pyroxyline, the main function of sulphuric acid seeming to be, as Leaper says in his admirable work, *The First Principles of Photography*, to dehydrate the nitric acid, which cannot at present be obtained sufficiently concentrated, in addition to some secondary reactions. The writer is of opinion that excess of sulphuric acid has a tendency to produce a tough and horny collodion, but whether this is exactly the case it is rather difficult to say. In many formulæ the proportion of sulphuric acid to nitric acid is in the ratio of three to one, or nearly so. This often produces a strong and contractile collodion, apparently owing to the parchmentising action which sulphuric acid exercises upon cellulose.

In a very comprehensive and exhaustive article upon "Photography" in Spon's *Workshop Receipts*, vol. iv., it states that the three-to-one proportion of sulphuric acid to nitric acid is not found to be the best for the soluble varieties of pyroxyline, and this somewhat coincides with the writer's experience and opinion, although he has not tried the formulæ given by Spon, which are in the proportion of two to one and three to two; the writer inclines to the opinion that the proportion of nitric acid is too great in the latter formula, yet, on the other hand, he believes that,

within certain limits, increase of nitric makes for greater solubility, although it is difficult to say that such is absolutely the case, but he is of the opinion that the best proportions will be found from 2 to 3 parts sulphuric to 1 part nitric; but it must be distinctly understood that this is merely the writer's idea, and may not work out so in all cases, for from the varying accounts given of the different actions of various formulae, it seems there must be some slight difference in the quality or quantity of the acids used or in the temperature obtained. The writer believes that the following will be found a very good formula for soluble pyroxyline:—

Sulphuric acid (1·842 - 3)*	10	fluid ounces.
Nitric acid (1·42)	4	" "
Water	1½	" "
Cotton	½	avoirdupois ounce.

Immerse at a temperature of 158° F. or 70° C.

Leaper, in his *First Principles of Photography*, gives a very good formula as follows:—

Strong sulphuric acid	12	fluid ounces.
Nitric acid (1·45)	4	" "
Water	17	drachms.
Cotton	270	grains.

Immerse the cotton at a temperature of 158° F. or 70° C.

The writer believes that the ordinary commercial sulphuric acid of 1·842-3 sp. gr. is quite strong enough for making pyroxyline, especially in the quantity given above, and, as nitric of 1·42 sp. gr. is about twenty-five per cent. cheaper than that of 1·45, 4½ ounces of the former may be used instead of 4 ounces of 1·45, and 15 drachms of water instead of 17. This formula gives a fairly soluble pyroxyline, making a collodion with a strong and not too porous film; but, for a high-temperature pyroxyline, Leaper says that the water should be reduced to 12 drachms, and the temperature raised to 74° C., or 165° F. Should 1·42 nitric be used, it would be necessary to reduce the water to 10 or perhaps even 9 drachms.

When a weaker acid is used than is contained in a given formula, the quantity must be increased. The writer has generally increased the nitric and decreased the water until the quantity and the sp. gr. of the combination of the weaker acid and the water equals the quantity and sp. gr. of the stronger acid and the water. Thus, suppose we take two formulae such as those given in Abney's *Photography with Emulsions*, as follows:—

Sulphuric acid (1·842)	18	fluid ounces.
Nitric acid (1·456)	6	" "
Water	4½	" "
<i>And—</i>		
Sulphuric acid (1·842)	18	fluid ounces.
Nitric acid (1·42)	6½	" "
Water	4½	" "

On comparing them it will be found that, by adding together the nitric and the water of the first formula, a sp. gr. of 1·2545 is obtained, and, by adding the same ingredients in No. 2, we get a sp. gr. of 1·254 nearly, the difference being practically *nil*, while the aggregate quantity remains the same.

Formulae are sometimes given where nitre is used instead of nitric acid. This, no doubt, answered very well in the early days of photography, when nitric acid was difficult to obtain, and even then not in a very pure state; but at the present time, when good and reliable acid can be easily obtained, it is not easy to understand where the advantage comes in.

It is very necessary that indiarubber gloves should be used when making pyroxyline, as the nitro-sulphuric acid mixture is of an exceedingly corrosive nature, and the hands, if unprotected, will soon be covered with yellow burns; it is also advisable to use a rubber apron. The clothes worn during the operation should be of no value, as it is almost impossible to prevent the acid splashing slightly, because the operations have to be conducted very quickly; if the clothes should get splashed, apply ammonia immediately to neutralise the acid. A quantity of cotton waste, tow, or rag should be kept handy to wipe the lips of the bottles free from acid after using.

It is necessary that plenty of ventilation should be obtainable in the apartment used for manufacturing pyroxyline, as the fumes from the hot acid are very unpleasant. The best kind of room is one with an opening at the top, so that the fumes can easily get away, as it is impossible to work with any large quantity of acid in a very enclosed space.

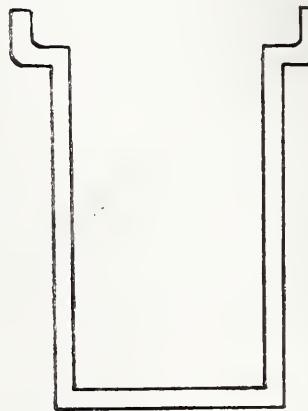
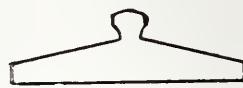
Do not use a wooden tub to wash the pyroxyline in, as the acid attacks the wood and turns it yellow, and if used for anything else will either mark or contaminate it. Be very careful to pour the water into the containing vessel first, then the nitric acid, and lastly the sulphuric acid. Should this method be reversed and the water added last, splashing will occur, on account of the great affinity for water which sulphuric acid has.

Thick glass spatulas are generally advised to be used for manipulating

* This is the strength of the acid usually sold as commercial sulphuric acid.

† He does not state the sp. gr. of the sulphuric acid, but presumably 1·845 is meant.

the cotton in the acids; but the writer cannot recommend them, as he has almost invariably found that the hot acid cracks them, more especially so with the high temperatures, and, as the ends sometimes fall off in the acid, it is very awkward to get the cotton out, and, should they break off while raising the cotton from the acids, the latter may splash up into the operator's face and eyes; therefore the writer recommends the use of earthenware spoons instead. It is much safer to use an earthenware vessel for the acids, for, should glass beakers be used and the vessel get a knock and break, the results are disastrous. The best kind of jar to use is a deep, narrow, cylindrical one; two very good pattern jars are those known in the earthenware trade as shut-over and upright covered, as shown in the following figures.



Upright Covered Jar.



Shut-over Jar.

A jar, where the neck narrows in with a ridge, should not be used, as the ridge prevents the easy extraction of the cotton, the jar should be as small in diameter as possible, so as to allow only a very small surface of acid exposed to the air.

It is absolutely necessary that a thermometer should be used; the best type are those with a long narrow bulb, as they are more quickly sensitive to slight changes of temperature.

The writer does not think that pyroxyline should be manufactured at a less temperature than 155° to 158° F., or 69° or 70° C., although the lower temperatures may be used for enamelling and wet-plate work where a strong tough film is required, and of course, in the latter, the plate is only worked while the film is in a wet and porous state.

When the acids are mixed, it will be found that the temperature generally rises to about 190° F. The mixture must be allowed to cool until the desired temperature is reached, and this must be maintained upon a water bath; the writer has usually found that large quantities behave somewhat differently to small ones, and that it is often necessary to keep the water bath at a slightly higher temperature than the acid mixture is required, or, if the jar is much exposed to the air, it loses heat quickly and the pyroxyline varies, this being especially the case with small quantities. The acids should be well stirred, so that the temperature may be even throughout, or, if the jar happens to be a thick one and very cold, the temperature round its sides and bottom will be less than in the centre, as heat does not diffuse very quickly through acids; to make sure that the temperature is even, stir the mixture with the thermometer, and move the latter up and down, noting if the mercury remains stationary while doing so.

While the acid is cooling, the cotton should be made up into about half a dozen balls, so that the acid may permeate well through it, and act equally upon it; when the right temperature is reached, each ball must be put into the acid separately, well pressed down into the acid, and stirred about, this must be done as quickly as possible or the first ball will differ from the last; when all the cotton is in, the acid must quite cover it or the cotton will decompose, this partly shows the necessity for thoroughly cleansing the cotton from grease, so that it may not rise in the acid. At first it will be advisable to look at the cotton occasionally to see that it keeps under the acid, as sometimes it has a tendency to rise even when clean, this is generally indicated by a bubbling noise in the jar; the cotton should be covered and left for about ten minutes, after which, quickly remove it, press out as much acid as possible, plunge into a large body of cold water, and move it about in the water to remove the acid as quickly as possible, or very likely the temperature may rise and decomposition set in; after being in this water for a quarter to half an hour, the cotton should be removed and placed in fresh water, after the lapse of an hour or

wo place in a third lot of fresh water, or a small stream of water should be allowed to trickle through until all trace of acid is removed, it must then be taken from the water and thoroughly dried, the sheet as described or the first drying answering well for this. Artificial heat should not be used for drying pyroxyline, or an accident may ensue. As the pyroxyline often breaks up into small pieces which are rather difficult to collect, it is a good plan to have a calico bag with a cane fastened round the top to keep it open and rigid, and then to pour the water and cotton into this, when the cotton is easily collected.

Unless very great care is exercised in the temperature and strength of acids, the first attempt at manufacturing pyroxyline will result in complete dissolution of the cotton. This is caused by too high a temperature or too weak acids. Sometimes, on removing the lid from the jar, dense red fumes are seen at the top, which is the result of the cotton rising above the acid, and, if the pyroxyline has been much exposed to the air while in the acid, on removing it from the jar it will spontaneously decompose as if burning, making a hissing noise and emitting very thick red fumes. This may be stopped by quickly plunging the cotton into water, but the collodion from this kind of pyroxyline is hardly likely to be of the best quality.

For getting rid of the acid, the writer is in the habit of using an earthenware colander to place the cotton in. The colander resting on top of a jar, and then, with a flat earthenware jar cover, similar to the cover of the upright covered jar shown in the sketch, quickly press out as much acid as possible into the jar underneath; it is best to have a knob on the jar cover, as it can then be held better. This will be found a much better way than trying to press out the acid with a glass rod or spatula.

Hardwich advises using the acid over twice, adding slightly more sulphuric to take up the water formed by the hydrogen abstracted from the cotton combining with the oxygen from the nitric acid; but the writer's experiments in this direction hardly justify him in recommending it, as the pyroxyline made lastly differs from the first.

There are one or two tests by which an experienced hand can get a fairly good idea of the quality of the pyroxyline without dissolving it. One way is to tear the cotton, and, if it is almost as strong as the original cotton, the resulting collodion will be tough, contractile, and horny; if, on the other hand, it appears rotten, and breaks easily, a porous and powdery film may be expected. Another way is to ignite a small piece; if it burns slowly and evenly, it is probably of the high-temperature variety, while, if it blazes up quickly with a kind of slight explosion, a strong and contractile film may be looked for. Another way to test it roughly is to put twenty to twenty-five grains into one ounce of ether-alcohol; if it dissolves readily and is fairly limpid, it may be judged as giving a non-contractile and porous film, while, if it dissolves in lumps, giving a thick, viscid collodion, a horny and contractile film will result. Properly made pyroxyline should weigh from twenty-five to seventy-five per cent. more than the original cotton, the greater the increase of weight the more contractile will the collodion be. A slight fluffy sediment will be deposited from the collodion when made up even with the high-temperature pyroxyline, and this is more pronounced with the low temperature; but, if the deposit is very heavy, the quantity of nitric acid should be increased.

C. T. SUTTON.

COPYRIGHT NOTES.

SOME of the editors of illustrated journals have learnt, through experience bought experience, that there is such a thing as copyright in photographs. Most of the leading professionals are members of the Copyright Union, whereby their interests are protected, and, if the Copyright Law is infringed, the photographer in question has a remedy, and damages can be obtained. Many photographers, however, consider the advantages of membership of the Copyright Union a mixed blessing. As is well known, the minimum reproduction fee that members of the Copyright Union may charge is half a guinea. Presumably, if the reproduction is no more than a square inch, this minimum fee would still have to be charged.

The advantages of membership of the Copyright Union may be very well for the prominent professional photographers, but for lesser workers the benefits that would be derived are not so apparent, and there are many capable professional photographers, non-members of the Copyright Union, who are prepared to accept a smaller reproduction fee for their photographs. Of course, it is still open to them to copyright their work and to charge a higher fee if they think fit. The same remarks apply to amateur photographers. They can, and do, protect their work, and proprietors of illustrated papers have, before now, to pay dearly for illegally making use of amateurs' photographs. A friend of the writer some time ago contributed a striking snap-shot to one of the leading papers. I think he charged five shillings for it; and it was cheap at the price. Some time later, he chanced to see this same photograph reproduced (probably it was the same block) in a small volume dealing with a subject, which the photograph in question appropriately illustrated. An explanation was demanded, which was not readily forthcoming.

The editor of the paper in which the photograph originally appeared claimed that he had purchased the copyright of the photograph. My

friend knew better. He was not in the habit of parting with the copyright of his photographs for five shillings, when it frequently costs him more than this sum to obtain the negative, there being travelling expenses, cost of materials, cost of registering the photograph, and various incidentals. The contributor of the photograph referred the editor to the receipt. The editor found the words, "including copyright," had been struck out, and the editor in question had to pay heavy damages.

On one occasion the writer contributed a rather effective photograph to illustrate an article, which duly appeared. Some time later the same photograph made its appearance in another journal run by the proprietors of the paper in which the photograph originally appeared, without either fee or acknowledgment. The remuneration received in the first place was five shillings, and it was a non-copyright photograph.

A somewhat curious incident occurred to me some time ago. I had occasion to obtain a photograph of a prominent person who had died, and this, living near the deceased gentleman's residence, I had no difficulty in doing. The photograph was duly published, and some weeks later the writer was surprised to receive a copy of a claim for very considerable damages made by one of the best-known portrait photographers of the day for infringement of copyright. I was away on holiday at the time, but, with as little delay as possible, I made inquiries of the photographer who was credited with having taken the photograph.

To be brief, it turned out that the photograph which the writer received from a relative of the deceased was really a copy of a photograph which had been taken many years previously by the photographer who was claiming damages. Rightly or wrongly, most professional photographers copy photographs when asked to do so. This had been done in this case, owing to the fact that the person in question would not be photographed again, and his friends desired more copies. The local photographer was in no way to blame for the publication of the photograph, and he knew nothing about the matter until it was brought under his notice. The writer was chiefly to blame, for an examination of the photograph would have shown that it was a copy, and, moreover, the word, "copy," was written beneath the photograph by the side of the local photographer's name. The writer at that time assumed this to refer to the photographer's name, emphasising the fact that he desired his name mentioned. Nothing was received, nor would it, under the circumstances, have been expected, and the incident caused much annoyance and inconvenience all round.

Competition in illustrated journalism has become very keen. While there are editors who are prepared to offer good prices for photographs which suit them, there are others who prefer to do without if they cannot have the use of them at what they consider a reasonable figure. The writer was asked by the editor of a well-known journal to furnish the photograph of a lady who is very prominent in connexion with the war in the Transvaal; but, as the photographer required a reproduction fee of one guinea, he decided to do without it.

Happily, we do not hear so much nowadays of those competitions in which a big figure is offered as a prize for the best photograph submitted, the editor reserving the right to use any photographs sent in; but, as the illustrated journals must have striking photographs, we will, doubtless, see other schemes announced very shortly by which the desired photographs may be obtained.

J. A. REID.

PLAIN SALTED PRINTING PAPERS—THEIR TREATMENT AND PERMANENCY.

THERE is little doubt but some of the most exquisite results in photographic printing that have ever been obtained have been produced by means of rough-surfaced drawing paper, salted, and finally sensitised by means of ammonia nitrate of silver, and, were it not for the widely accepted belief that these samples of printing paper lacked one of the chief essentials in photography, viz., permanency, there is no question but they would be in much greater request at the present day than is the case.

The question of permanency in the results obtained by the use of these papers when silver is employed as the sensitising agent is, no doubt, to a very large extent dependent upon the treatment those printing papers receive at the hands of photographers, both in the preparation of the paper and also in the after-treatment of them when the printing stage is reached, and any one preparing and using these papers for the first time ought to understand that in several respects their manipulation will require to be differently conducted from that ordinarily bestowed upon the smoother classes of printing papers so much in use at the present time.

Many years ago the writer gave a considerable amount of thought and attention to the preparation and after-treatment of both thick rough and thin smooth samples of plain salted paper, and the results now seen after a considerable lapse of time are highly instructive, and go far to demonstrate that lack of permanency is traceable in a great measure to the faulty treatment of these papers.

In the preparation of rough-surface drawing-papers for photographic purposes a beginner will be struck with the apparently extreme ease and

simplicity of the various manipulations required in their production, for it is quite within the scope of any lady or gentleman who may feel inclined to bestow a little thought upon the operation.

Hand-made samples of drawing-paper of almost any degree of texture are readily obtainable from any respectable stationer or artists' colourman, and of the various brands perhaps there is none more reliable than those of Whatman's manufacture, any size sheet or portion of which can be salted and sensitised as occasion requires, for a period of about half an hour's time is sufficient, not only to salt, but likewise to sensitise and dry a sheet or so in perfect condition for the printing frame.

In the operation of salting, the writer has no hesitation in giving it as his opinion that many of the hints published from time to time regarding the best means of performing this operation are, to a beginner, misleading, or at least do not convey information that is most likely to lead to ultimate success. For instance, in very many cases where instruction is given how to prepare a salting solution for rough-surface papers, gelatine is recommended as the proper medium to employ in combination with chloride of ammonium or sodium. The writer is far from wishing it to be understood that gelatine is not suitable for the purpose. In the hands of experienced parties it has been employed from the earliest days in photographic printing; but the chances are about ten to one against a novice who for the first time essays to sensitise a sheet of paper, being able to salt his paper satisfactorily when gelatine has been used. A far better medium is found in arrowroot worked up into a very thin paste or mucilage.

And here let it be noted that different samples of paper require varying strengths of salting solution. In the early days of silver printing, the preparation of the paper previous to the silvering was considered a separate branch of photography, for the work of the printer was understood to begin with silvering the paper, and it was only by the experience he possessed in dealing with one and the same brand of salted or albumenised paper that he was enabled to arrive at the best strength of silvering solution to employ for the particular class of paper being used, and it was no uncommon event for an experienced printer to find out that one brand of paper, owing to some property it possessed, would give beautiful results when silvered after a formula that would yield nothing but failure under different circumstances. Therefore, when dealing with these papers, a beginner ought never to adopt some particular formula that he or she sees heralded forth as most suitable, and rigidly stick to it, expecting it to work equally well in every case; rather should he study closely the behaviour of a particular quality of paper when treated with a well-conceived formula of salting and silvering, and, when he has arrived at the best results, to note carefully how these results were obtained, and follow such in their after-working.

One of the objects of employing such organic substances as gelatine, starch, arrowroot, or tapioca, is with the view of filling up the pores of the paper so as to retain the printable image as much as possible upon its surface, thereby giving the picture the utmost amount of brilliancy and vigour, and this function of whatever organic substance be employed, in conjunction with the chloride used, should be kept in view by whoever is undertaking the operation, and the mode of applying it to the paper, as well as the proper consistency of the chlorine solution used, should receive careful consideration.

In the case of gelatine, when used as an organic substance in conjunction with chloride of ammonium, it is not infrequently recommended that, after a salting solution is prepared by thoroughly dissolving a quantity of gelatine in the proportion of ten to twelve grains per ounce of water along with about sixty grains of chloride of ammonia, that the paper should be *immersed* in this solution. This treatment, however, is far more liable to yield poor results than when it is merely applied to the surface only of the paper by floating or swabbing; the latter, however, requires some practice to enable any one equally distributing the salting solution over the entire surface of the paper, and here we have just another instance in photography, where an operation is lightly passed over, with the briefest possible description, that ought to be most fully explained, so that any novice could be guided to do the operation successfully.

The coating evenly of an entire surface of a small sheet of paper is by no means so easy as many imagine, and, if the gelatine solution is not kept at the proper temperature during the operation uneven sensitising will be the result. Floating, again, requires practice to avoid air bells, &c. If, however, swabbing be decided upon, then let a good flat swab be made by taking a sufficiency of flannelette to form three thicknesses of the material, and, having provided a long strip of glass about four inches wide, lay the flannelette over the end of same, so as to allow of about one inch of cloth to act as a swab; this is far and away the best tool to employ for the purpose; any one can make it for themselves, and it will work better than any camel's-hair brush ever did for this purpose. In doing this, the paper should be laid flat on any convenient support, and a large sheet of clean white paper placed underneath that, being coated, will prove cleanly and useful.

When evenly coated, the sheets are pinned up by one corner to dry in close proximity to a moderately hot fire. A few minutes of time will suffice for drying, and when so will keep indefinitely; a cross mark being applied on the wrong side will help to satisfy the operator which is the correct side to sensitise when the silvering stage is reached.

Some of the finest prints the writer has ever seen on plain salted paper have been produced with a salting solution made with arrowroot and chloride of sodium. The latter, in its proper proportion, when quite dried in a clean porcelain saucer, is dissolved in clean water, and the latter is boiled in an enamelled saucepan. A sufficiency of arrowroot is then mixed in a clean basin to form (when the boiling water is added) a very thin paste of about the consistency of cream. This, when nearly cold, is swabbed over the surface of the paper in exactly the same manner as described above. Some writers advocate the immersion of the paper, but this is apt to yield a sunken appearance to the prints, the final sensitising with silver not being kept sufficiently on the surface.

With ammonia nitrate of silver the solution is likewise applied by means of the glass and flannelette swab, one being provided for each purpose.

To make the sensitising solution, strong liquor ammoniae is added to a solution of nitrate of silver (say of a strength of about sixty grains per ounce) until the dark brown precipitate formed is redissolved, and the solution turns water white again. Half of the quantity thus made is taken in a clean glass measure, and made just acid with a drop of pure nitric acid. This is then added to the other portion, and, when filtered, will form an efficient sensitising solution for some salting formulæ and brands of paper.

In applying this solution, the paper ought to receive at least two coatings. After the first has been applied, the paper is dried near a bright or brisk fire; it is then allowed to get quite cold, when another coating of silver solution is applied, then dried again, and is ready for the printing frame. Paper prepared in this manner will not keep in good condition for any length of time; but, as the sensitising is so easily and rapidly performed, there is no need to keep a supply ready-sensitised.

Printing is conducted in exactly the same way as other samples of printing papers; but it is when we come to the toning and fixing stages that special precautions require to be observed, so that permanency in the resulting pictures may be obtained.

One of the first essentials towards permanency will be found in the almost complete removal of the free silver from the paper prior to the operation of toning, and this must be strictly attended to both when dealing with thin as well as thick samples of paper, for every fibre of the paper must be thoroughly reached with the washing water before toning be attempted. Several changes of washing water will be required before this will be effected, and, if it is inadequately performed, it is easy to see what mischief will result.

When the paper received its coating of ammonia nitrate of silver, by reaction with the salting material employed, chloride and organic salts of silver were formed in and on the surface of the paper, both of which are necessary; but, in addition, there is always more or less free silver present. Now, if this latter is only affected by a mere slight operation of washing prior to toning, the soluble silver becomes as it were diluted, and in such a condition is very liable to soak into the paper instead of being retained on the surface, and, if this happens, not only will the operation of toning be interfered with to a certain extent, but, when the fixing operation is reached, the imperfectly washed print is sure to give trouble by reason of the available silver in the print becoming converted into hyposulphite of silver, which, in its turn, must be dissolved in an excess of hyposulphite of soda.

As a further precaution, all samples of these papers ought to receive special treatment between the operations of toning and fixing. This means subjecting the toned prints to an immersion for ten to fifteen minutes in a fairly strong bath of salt and water, from which they are removed to the fixing bath.

It follows therefore that plenty of water must be applied to remove nearly all the free silver prior to toning, and that the most thorough fixation should be given; and, if this be carefully seen to, the image on these papers will be as permanent as those of any others having silver as their base.

Where the washing and fixing has to be so thoroughly performed, the printing must be carried deeper than with other samples of paper, and perhaps there is no more suitable toning formula than acetate of soda and gold, the function of which is to attack the light-changed image of silver and nothing else, so that there ought to be little or no free silver present to interfere with the action of the toning bath.

Another method of toning these papers has been recommended, viz., by chloro-platinite of potassium, which can be obtained in small quantities from the Platinotype Company. By means of this, pure sepia tones can be obtained as well as black tones by merely altering the strength of the toning bath, but when properly treated these papers can be made to yield with gold and acetate of soda almost any tone that may be desired from reddish-brown to purple-black, whilst, on the much-abused score of permanency, there need be no fear.

A. T. NEWTON.

ON MOUNTING PHOTOGRAPHS.

LOOKING over a collection of an ardent amateur a short time since, I was struck by the very small number of mounted specimens of which it could be said that they were *properly* mounted. I do not mean only

from an artistic point of view, but as work carefully carried out, and when I gently and very timidly drew attention to a ragged corner, and a splinter, my friend said, "Oh, I don't pretend anything about the mounting! I care only for the picture."

Now an effective photograph, properly and carefully mounted, is like an elegant lady in tasteful attire, and, if I see a corner coming up or an edge not secured, my eye is drawn to that directly, and away from the beauty of the picture.

I do not propose to describe all the various mounts now in use; a trade catalogue and a little taste will generally decide what is suitable, but I want to speak of the way in which a photograph can be most easily mounted and keep its place.

First, as to the trimming, for in mounting on cardboard, which is now quickly regaining popular favour, we must very carefully square, and cut straight and true, without jagging or tearing the print.

The best material to cut on is the smooth side of a thick piece of ground glass, and it should be large enough to prevent the knife passing away over the edge, or the cutting power of the knife is quickly lost. It is well to grind the edges of this slab to protect the fingers, and always put it away with care to prevent chipping the corners. When, by frequent use, it has become cut and scratched, it is better to have a new one, as cutting over scratches makes bad edges and spoils knives and tempers.

The knife must be of good steel and not too sharp, and no notches at the point, or they will tear the print. The handle should be strong, and comfortable to hold in the hand. In cutting, it should slope only enough to prevent dragging the print; an angle of forty-five degrees is best as a rule.

The cutting shape should be a very true piece of stout glass, and, if the lower side is coated with negative varnish, it will seldom slip.

Some mounters turn the print round to get at it, but it is well to endeavour to move and regulate the hand instead, as it saves much time in doing many.

Before cutting, see that you have your print quite upright, and, if there is a line of distant sea, that line must be perfectly horizontal. If the negative has a building distorted by tilting up the camera, so that the uprights at the sides lean together, it is generally a good plan to give a little each side, or let the principal lines rule the balance, and so keep the spectator's eye from annoyance as much as possible.

If prints are much curled or cockled before being taken in hand, they are much improved by being flattened in an old volume of bound music, as the music paper is slightly absorbent, and will do much to "smooth" matters generally.

Now, as to the mountant. There are many in the market sold ready for use, but none are so good as freshly mixed cornflour. It can be used warm or cold, and needs no hot-water bath to keep it in working order. To mix it, the best plan is to put a spoonful in a small basin, and add a little water just to moisten it; then pour boiling water on it and stir till it thickens, and add a very little more water, or it will be too stiff for use, especially as it cools.

The brush should be an ordinary sash tool or painter's brush, of a size suited to the work. If a new one, soak it for an hour in cold water, or the bristles will come away on the back of the print, and cause much trouble.

Next procure a nice, well-made drawing or pastry board, and also one or two good sponges and a couple of white handkerchiefs. Have a basin of clean warm water at hand and thoroughly wet the board; place a print face down on this board, and paste the back till the print lies flat. If the prints are on gelatine, it may be best to lay on the board a stout piece of wet calico, as the gelatine might stick to the board, but it will not to the calico. When the print lies flat, put down another alongside to soften, while you put the first one in its place on the mount. Lay a piece of clean blotting-paper over the print, and pass over it a roller firmly and evenly to roll out bubbles. Lift the paper, and with a sponge carefully remove any paste that has rolled out; lay the print aside to dry, and sponge over the board and lay another down to soften while you treat No. 2 print as you did No. 1. When the mounted print is surface dry, put it under a weight to keep it flat.

Pictures that are to go under cut-out mounts should never be trimmed, as sometimes they are cut rather too small by mistake. When all are mounted, go carefully through them to see if edges and corners are well down, and then let them rest all night, if possible, under a heavy weight.

ALFRED SEELEY.

TABLOIDS.

At the meeting of the Richmond Camera Club, on January 22, Mr. Ardaseer in the chair, Mr. John H. Gear gave a demonstration on the use of Tabloids. Mr. Gear did not, however, confine his remarks to the subject of Tabloids, for he commenced by some practical illustrations of the improvements to be effected in pictures of "Nature just as she is" by the judicious use of cloud or water negatives (or both) in combination with the original negative and by trimming the print so as to exclude what was superfluous, or to improve the balance of the composition. Some slides by Mr. Gear, which admirably illustrated his remarks, were passed through the lantern.

Mr. Gear then addressed himself to the subject of Tabloids, and showed a very compact leather wallet, which, although of moderate size, contained sufficient material to develop, fix, tone, &c., a large number of negatives or prints. It was clear that the tabloids (which are made by Messrs. Borroughes & Wellcome) must be a great convenience to the traveller who wished to develop his negatives or produce prints thereof in the course of his journey. No liquids need be carried, it being sufficient to crush and dissolve one or more tabloids in the prescribed quantity of water to produce the various solutions required. The tabloids were also useful to the amateur, who need not make up more developer, toning bath, &c., than he actually needed, thereby saving the loss often experienced through the stock solutions becoming spoiled by keeping.

Mr. Gear's wallet also contained tabloids of persulphate of ammonia, and its value as a reducer was well shown by means of a lantern slide which Mr. Gear had brought with him. The slide was first shown on the screen in its original state, and again shown after the ammonia persulphate solution had been applied to the over-dense portion with a brush. No care was taken to avoid brushing the solution over the delicate detail of a church tower, which was surrounded by the dense deposit, and the effect of the persulphate in attacking only the dense portion without affecting the detail in the tower, was very remarkable, and was well shown on the screen.

Mr. Gear concluded by showing some more slides of a miscellaneous character. Some of these, which were copies of architectural drawings, illustrated the power of hydroquinone in giving a dense black deposit without affecting the white background.

CRISTOID FILMS.

BEFORE the Photographic Section of the Croydon Microscopical Society on January 24, Mr. F. J. Townsend in the chair, a demonstration on "Cristoid Films" was given by Mr. J. H. Baldock, F.C.S. These films differ from anything else which has been produced inasmuch as they are just films, and nothing but films, no support of any kind, either paper, celluloid, or glass. They are composed of two films, a rapid one and a slow one, superposed on one another (the Sandell double plate without the glass in fact), so that the effect can be varied according to which of the two surfaces is placed towards the lens and receives the first impact of light. They can be used in any ordinary slide by employing either a backing card or some form of film-holder. The amount of exposure to be given them, although, of course, there is what is termed a "correct exposure," does not really much matter, as you will see, provided it is sufficient. "I show you two films to which I intended to give exposures of 10 and 100 seconds respectively, at f-32, but, forgetting to put in a stop, they consequently received at f-8 the enormous exposures of 160 and 1600 seconds (about 2½ and 26 minutes); but, as you see, printable negatives were obtained from both of them. Development in this case was carried on for 15 minutes to get density, and then they were reduced. I show you two more of a Welsbach mantle alight, one had 15 and the other 60 seconds, at f-32; observe that in both cases the crutch supporting the mantle, the chimney and its support, and even the meshes of the mantles itself are plainly visible; compare these with this negative on an ordinary glass plate in which not a single one of these details is present, the whole being completely lost in a vast circle of halation extending far beyond the glass chimney. Another of a window, which had 40 minutes at f-22, the light was not very bright, and there was not much inside the room, but you will see that the outline of the window, and the fringe at the edge of the curtains, are as distinct as possible, not the smallest trace of halation; compare this with an ordinary plate, the difference is striking.

"I shall presently develop four films, which have had exposures of 2 seconds, 20 seconds, 1½ minutes, and 6 minutes respectively, and you will then be able to see that it is possible to get almost identical results in each case. I need not give the several processes employed, as they are succinctly stated on the paper of instructions issued with the films, and which I hand round, but I will just show you practically." The various processes of development, fixing, reduction, squeegeeing on to glass, and varnishing were then gone through successfully, Mr. Baldock concluding by saying that he thought it was self evident that these films possessed certain advantages which pertained to no other negative surface, because exposure and printing, besides the other operations just shown, could be performed on either side of the film. For carbon printing and cloud effects this was obviously an advantage, as it saved the trouble and expense of making reversed negatives. Reduction, too, taking place, as it did, on both sides, could, as seen, be done with Farmer's reducer, so that there was no occasion to use the new and very valuable ammonium persulphate reducer.

"The only difficulty, if such it can be called, lies in the drying; this, being of necessity from one side only, takes rather long, consequent on the thickness of the film; and, if the film leaves, or is taken off the glass before it is quite dry, it buckles thus (as shown), and cannot in that state be printed from, but must again be thoroughly wetted, and again squeegeed. This, however, can easily be got over by placing the films, after washing, in methylated spirit for a few minutes. This allows them to dry in less than half the time, and reduces them to their original size

as in the processes above described they have expanded about twenty per cent. in area. Obviously, too, if it is intended to varnish it on *both sides*, it must be *quite dry* before the top layer of varnish is applied, although, of course, the second coat of varnish can be put on *after* the film is taken off the glass. There is one other and very important advantage in these films, *i.e.*, their non-inflammability, which should make them invaluable for cinematograph purposes, as they would at once cause the removal of the restrictions which have been placed on these exhibitions. I believe, too, it is the intention of the Sandell Company to prepare them in spools for use in roll-holders for daylight changing."

"COLLEGIATE" PHOTOGRAPHY.

OUR American professional brethren have amongst them, in Illinois, a "College" of Photography, where it is to be presumed the students engage in the pursuit of photographic knowledge, on what we may term the University plan. But, to judge by some notes from the College, which were recently published in an American contemporary, the work of the students is agreeably diversified by marriages and jokes—other jokes, a cynic might say. Thus: We have again been thrown into raptures over the fact that one of our number has seen fit to take unto himself a mate to "boss" and rule him for evermore. This time it is Mr. E. E. Godfrey, Milton, Wis., who married Miss Mayme Arendt, of our city. Mr. Godfrey has recently opened a studio in Waukegan, Ill., where we feel sure he will make a success. We hope the *lighting* and *shadow* of Mr. Godfrey's married life may be so *blended* as to produce the best *gradations*, and that Mrs. Godfrey may keep a close *focus* on all his actions and cause him to *retouch* out all the faults that he, in common with the rest of mankind, may be heir to, and we hope that between them they may *develop* a picture of married life of *positive* beauty, and that the *negative* side of this life shall only be prominent enough to relieve the monotonous effects of too much pleasure; that the *duplicates* of the Godfrey family may be in evidence, and that *family groups* may rise up and call them blessed.

AGAIN: A few days ago Mr. Hickman was giving instruction in printing to a party of young ladies, when one of them accidentally knocked a drachm graduate off the toning table. Mr. Hickman remarked "Please pick up that d(r)a(ch)m graduate." "Oh!" said all the ladies in chorus. "No offence," said Mr. Hickman.

ANOTHER: In giving instructions in making up plain lighting calls the students' attention to the high lights on the face being on the forehead, the nose, the lip, and chin. A few days ago the little six-year-old son of one of our lady students came running to his mother and said, "Oh, mother! I have fallen down and skinned all my high lights." His face was skinned on the forehead, nose, and chin. Who says he will not be a photographer some day?

FINALLY: A young lady, who is a student of the Illinois College of Photography, was entertaining a young gentleman, a classmate. With a longing desire to make the young man's visit more pleasant, she turned to him and exclaimed, "Shall I sing 'Because I Love You?'" "No," replied the good natured brute, "if you really love me, don't sing." Then they played a game of "Freeze-out."

THE SOUTHSEA EXHIBITION.

WE need not hesitate to say that the Twelfth Annual Exhibition of the Southsea Amateur Photographic Society takes a position well ahead of any previous Exhibition of the series, and well in rank with other provincial society Exhibitions. The improvement upon last year's record, both in the members' and in the open classes, is most marked.

In spite of the great general advance in the members' classes, the Secretary (Mr. F. J. Mortimer) easily holds first place. He is to be congratulated on his determination not to accept all the medals he has so ably won this year, and we think that next year he might enter the open classes only. His best works are, perhaps, the two in the Architectural Class, for which he receives 1st award; but the set of four hand-camera studies (1st prize), the figure study (1st prize), the enlargements (1st prize), the lantern slides (1st prize), and the landscape (certificate) are all good, and are backed up in almost every class by many other good things.

In Class A (Landscape), Mr. L. Dyer scores 1st with one out of eight good, broadly treated landscapes. Mr. H. J. Hissett (2nd) has seven attractive things of the birch-and-bracken school; and Mr. P. Denham's estuarine quay-side well deserves its certificate. Mr. G. Wood has three good but unequal little things, and the rest of the class is of good quality.

Class B (Figure Studies and Portraits), besides Mortimer's has a study with a good characterisation, but curious cutting of two of the figures, by L. Dyer (2nd), a pleasing, simple portrait, with detailless background, by P. Denham (certificate), two excellent birds' nests and one bird by Dr. J. H. Kelso, and two good ordinary groups by Mr. A. Fisher.

Class C (Architecture) is very strong, and amongst other good work are five interiors by Mr. G. Wood, three well-chosen bits in Canterbury crypt by Dr. G. H. Newby (2nd medal for one), a good relief panel (certificate)

by Mr. A. Fisher, and commendable work by Messrs. L. Dyer and S. Arnold.

Class D (Hand Camera) is weak in typical snap-shot work, the most genuine snap-shooting being *The Major's Yarn*, for which Mr. W. J. Lewis receives a certificate. Mr. L. Dyer's three sets are good landscape, &c., and one takes second medal. Mr. F. O. Field has three pretty little shipping studies.

In Class E (Enlargements), Mr. L. Dyer (2nd prize) has much striking work—perhaps over-enlarged; and Mr. F. O. Field would probably have received the third award had there been more entries in the class.

The Open Landscape Class is very strong and very even in quality. Mr. W. A. I. Hensler's *Stormy Sunset* (1st prize) is run close by his other picture. Mr. W. E. Dunmore has four good things, and takes second medal for a deserted beach (untitled). Mr. A. R. Read takes the certificate with a charming little peaceful marshland homestead; and there are worthy things by Mr. F. W. Bannister, Mr. James Critchley, Mr. H. Quilter, Mr. E. A. Price, Mr. W. F. Slater, Mr. Charles J. Hankinson, and others.

Class H (Portraiture, *Genre* and *Still Life*), brought out such a good competition that the Judges divided it into two sections (portraits, and *genre*), and gave in each more awards than were offered for the whole. Mr. W. J. Byrne's large direct portraits, though not medalled, could not fail to arouse admiration. The portrait awards were: (1) Mr. Leslie Shawcross, for a noble *head of an old man*, treated with reverence and entire success; (2) Mr. F. W. Fielder for *Daydreams*, an admirable piece of portraiture. Bracketed together for certificate are Mr. Graystone Bird and Mr. F. Fielder. In the *genre* branch of this class Mr. Fielder would surely have scored again, had not the Judges felt that two medals could not well go to one man. Mr. Charles Sweet's, *The Scotsman*, took a well-won 1st, with Mr. W. E. Dunmore's *Talking Shop* and an excellent smithy interior, with smith at work, bracketed equal for second prizes. Three equal certificates were given to Mr. C. Skelton Tyler, Mr. R. S. Harding, and Mr. H. C. Leat. These awards by no means exhausted the noteworthy work.

Class I (Hand-camera Work) is not so strong as a whole, but the six rural scenes by Mr. J. Kearney, jun., well merit their silver medal. The bronze goes to Mr. W. Fisher Ward, and the certificate to Miss Alice Worsley, for good but not very distinguished work.

The Beginners' Class (K) is a decided surprise, and, if the competitors are all genuine beginners, the older men may expect strong new competitors ere long. The prizes go (1) to Mr. S. A. Pitcher for a beautifully treated *Scriptorium, Gloucester Cathedral*; (2) to Mr. W. P. Baker, for a portrait study; and certificates (equal) to Mr. A. Seed and Mrs. W. F. Clark.

The lantern slides, again, are numerous and very good, so that in both classes the Judges have given extra awards. In the Open Class we find (1) Mr. John Beeby; (2) Mr. A. T. Crane and Mr. E. R. Bull (equal); (3) Mr. Graystone Bird and Mr. A. E. Smith (equal). In the Members' Class the awards go to (1) Mr. F. J. Mortimer; (2) Mr. L. Dyer; (3) Colonel H. W. B. Bruno and Mr. A. Fisher (equal).

In each class the first prize is a silver medal, the second a bronze medal, and the third award is a certificate of merit.

The Judges were Messrs. H. Symonds, H. Snowden Ward, and G. West. In addition to the competitive classes there is an extensive collection of pictures "not for competition," and there are the extra attractions of tea and light refreshments, mutoscopes, and lantern-slide and cinematograph displays. Moreover, the admission is free. Verily, Southsea is a place of enterprise!

EXHIBITION OF THE LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual competitive Exhibition of this Society, which opened on Friday, the 12th ult., contains a smaller number than usual, counting the photographs themselves, though the tale of competitors is, perhaps, not so much reduced. To some extent this apparent diminution of interest may be accounted for by the fact that, on the present occasion, each of the competitive sets had to contain three pictures only, instead of, as lately, four, and, dating further back, six. Possibly also, as the Judges suggested, the permission to send the photographs framed acted as a deterrent among the more diffident members. As a matter of fact, every picture sent was enclosed in a frame, greatly to the enhancement of the decorative effect.

The Judges were Messrs. W. T. Greatbach, Thomas Huson, and Watmough Webster. The Challenge trophy and gold medal were awarded to Mr. J. E. Coney Wilson, one especially of whose works, *Sunset Glories*, we shall hope to see at the next display at Pall Mall. This is a noble study of sky and water, which commands instant attention by an unusual luminosity in the light streamers of cloud illuminated by a low sun hidden by dense, dark cumuli. Two meritorious prints—*Quiet Pastures*, a flock of sheep herded under the shadow of tall pines, and *Light of Even*—complete the set.

The Society are lavish in their medals, four of silver being at the Judges' disposal for the best four sets of three (open to all members of the Society). The successful competitors are Mr. Joseph Appleby, who is medalled for two studies of wave and cloud and one Alpine view of less merit. The effect of waves breaking over a semi-submerged rock is very fine.

Dr. Llewellyn Morgan's medalled set has two life studies, which deserve a high meed of praise. An old fisherman's head with a sou'-wester cap, taken in strong sunlight, is a portrait of considerable power, marred only by a background devoid of shadow or variety, "as smooth as paint." His other figure picture shows us a woman standing at the top of a steep path looking, with hand-shaded eyes, seawards. It is composed well, and has breadth of treatment and poetical feeling.

Dr. Jno. C. Saunders (gold medal)—medical men seem strong at Liverpool—is to be congratulated for his view of a hillside clothed with low shrubs, one solitary tree jutting out from the sloping outline of the hill, clear cut against the sky, giving great value to the whole. With a little more vigour in the immediate foreground this picture would have been perfect. In another of his set we have a stranded flat, with telling, broken reflections in the shallow water of the ebbing tide.

Mr. F. Anyon has a fine sea picture, with waves breaking over low rocks; in another otherwise excellent marine picture, the sky is a little too heavy. *At the Well* represents a village maiden posed leaning against a tree trunk, with logs of wood at her feet. The same figure and pose transferred to other surroundings would have been worthy of much praise, but as now seen the composition is imperfect.

Mr. Jno. H. Tower also essays figure compositions, with a fair measure of success. A portrait of a man seated in the light of a window is good, but the shadows of the figure want vigour and roundness. An Eastern picture of remarkable character, showing a long row of figures in attitudes of devotion, their faces to the wall, is very striking.

Dr. Llewellyn Morgan exhibits a good interior.

Mr. Depree is to be congratulated upon one of his three figure studies, a beautiful almost life-sized head and bust of a woman, with the face directed upwards; the whole is most naturally posed, well conceived, and well lighted. His *Lord of the Desert* is ambitious, and technically excellent—a handsome man's head with Arab head-gear, but smacking rather of the studio than the desert.

Mr. Carruthers' *Dinner Time* is a good photograph of a difficult subject—horses in the middle of the road—but the interest is scarcely sufficiently centred.

Mr. A. J. Booth exhibits three Alpine scenes of quiet, silvery tone, very pretty.

Mr. W. E. Inston's are small in size, one representing a quiet mere, or river broad, with trees on each side, and a low hilside in the distance, only wanting size to make a very telling picture.

Mr. J. A. Appleby shows *Sand Dunes*, effective, but the subject is rather played out. His two figure pictures are evidently the result of considerable work, but they do not attract us; besides, there is too much evidence of the brush.

Mr. Jno. Parkinson, in a little view (half - plate size), gives us a capital group of cows.

Mr. F. Anyon exhibits three fruit compositions, printed from what we should imagine to be perfect negatives, but the arrangement of the objects is open to improvement—the interest is too scattered.

Mr. Harvey has three exquisite little interiors from quarter-plate negatives, taken, we imagine, with lantern-slides in view.

Mr. F. B. Sutton, in *Music by Handle*, shows a well-composed figure group brought together by a barrel organ, the street seen on one side vanishing into dull distance being effective. He has also a pastoral scene: a group of sheep with central figure of the herd behind them; a difficult subject, well photographed, but deficient through being so completely symmetrical. The herd is exactly in the middle of the sheep, and the bushes behind exactly equal on each side of his herd. If he had had the fortune to have placed the shepherd a little to one side the photograph would have been a true and beautiful picture.

Mr. Harvey has further small views of river bend and cows by riverside. We should imagine that if he had selected his views differently as to arranging for sets, he would have received a medal, though small photographs, judged by the side of those of much larger dimensions, need to be of such passing excellence to have their merits recognised. We think that class at these exhibitions specially for small photographs, or hand-came^aa work, would be advantageous. We believe this Society formerly had such a class.

Of Mr. A. A. Booth's three Alpine views, one showing cows on the margin of a sloping hill silhouetted against grey distant rocks is the most attractive.

The President of the Society (Mr. Paul Lange) offered a silver medal to be competed for by ladies only. There was only one competitor, but the award was made for a set of photographs of still life. Sprays of flowers, birds' nests, with other objects were included and showed evidence of considerable pains. We suggest that if the exhibitor would include fewer objects and devote all her attention to the simple arranging and illuminating them she would obtain pictures that would appeal more to her own judgment.

In the Class for Scientific Photography were exhibited some carefully executed photo-micrographs, one medalled photograph showing one half of a particular diatom which is a most difficult object to photograph (enlarged 3000 diameters). *Amphipleura pellucida* gave the transverse striae (they are about 100,000 to the inch) with great clearness.

Mr. J. Chrichton Timpany's (bronze medal) set of views of Peel, included a very pretty representation with vessel in the near foreground

and the castle in the distance the sun striking its outlines at a few salient lines with considerable effect.

The Class for Lantern Slides showed, for Liverpool, a remarkable falling off in numbers. We cannot refrain from drawing attention to Mr. H. J. Houghton's set of six, which included some most beautiful winter scenes and one most picturesque representation of Eastern life.

Mr. J. Parkinson's river scenes were excellent, the set being marred by one very ineffective view mainly of a rhododendron bush which by accident or design was suffused with a pink tone. Mr. Gostenhoper's and Mr. S. Cann's bronze medalled slides were good, but the competition was not close. We feel that in this direction Liverpool has not done herself justice, having regard to the small number of slides sent in for competition.

Our Editorial Table.

A SELF-TONING LINEN FABRIC.

O. Sichel & Co., 52, Bunhill-row, E.C.

We drew attention some time ago to the agreeable effects producible on the self-toning papers of Messrs. Sichel & Co., purple or sepia colours being obtainable by simple fixation and washing. The latest introduction of the self-toning series is the "S. T. Linen Fabric," which is treated in the same manner as the paper, and sold at the same price. Having a stout back, as Messrs. Sichel point out, it is not necessary to mount rough specimens, although for finished prints it can easily be mounted. We append the principal working instructions to illustrate the simplicity of the process, which, as we have said, gives capital results:

Print (under tissue paper if in the sun) a shade darker than is desired in the finished prints.

The prints may be put directly from the printing frame into the hypo bath; but, to prevent getting spots from air blisters or hypo fingers, it is advisable to place them first in clear water until thoroughly soaked, and then into a solution of one ounce of hyposulphite of soda (crystals) and twenty ounces of water, hydrometer test 20. Keep the prints moving in this solution for five minutes, then wash in running water until the hypo is entirely removed, which takes an hour; or, if washed by hand, take at least eight changes of clear water. Mount as usual. Burnish like albumen pictures, using as little soap as possible for lubricating; the brilliancy of tone of the prints is brought out by burnishing. For matt a cold burnisher is used.

For carbon (black-and-white) effects, print several shades darker than desired in the finished print. Wash the prints in three changes of clear water, and then place them in any good platinum bath until the reddish brown disappears from the deep shadows. After this, give one wash in clear water, and then place in hypo solution as above directed.

In sending us a copy of their twenty-four-paged, neatly produced price-list of printing and enlargements, Messrs. Elliott & Son, of Park-road, Barnet, ask us to intimate that they will be pleased to supply all professional photographers with a copy on application.

THE HELIOTYPE MATT PAPERS.

Agents: Holmes Bros., 24, Southall-street, Manchester.

For this new series of papers the following are claimed as the chief characteristics: 'Great range of tone, from bright red to dark purple and from sepia to dark brown with a simple gold toning bath; also to the purest black with a platinum bath. Absolute purity in the high lights; an entirely new surface in the basis of the paper; great ease in manipulation; uniformity of results; absolute permanency if instructions are carefully followed; no cracking, curling, or discolouration; keeping quality good; no special negatives required; great economy in working, it requiring very little gold.'

The paper is supplied in three qualities, coated upon different raw paper: T, rough paper, with a grained surface, suitable for large portrait work, &c.; E, smooth grain, suitable for small portrait work, &c.; A, medium rough grain, suitable for landscapes and also portrait work. We append the principal working instructions:

Before printing, hold the paper from four to six minutes over a dish containing liquid ammonia (SSO), the coated side downwards, so that the ammonia vapour can penetrate it. Print rather vigorously until the shadows appear bronzed and all the details are out in the high light. Wash in various changes of water for five to ten minutes. Immerse the prints for two or three minutes in a bath of $2\frac{1}{2}$ to 5 drachms of table salt to 5 or 6 ounces of water. Wash again in several changes of water until the latter is quite clear.

No. 1.—RED (LIGHT AND DARK) AND BROWN TONES, &c.

Tone in the following solution, taking 10 parts of A to 2 parts of B:—

A.

Distilled water.....	$\frac{1}{4}$ pint.
Refined borax	$\frac{1}{2}$ drachm.
Acetate of soda	$\frac{1}{2}$ "
Citric acid	$2\frac{1}{2}$ grains.

B.

Distilled water.....	$\frac{1}{2}$ pint.
Chloride of gold	2½ grains (or 15 grains to 1½ pints).

Stop toning when the desired colour is reached. By leaving the prints for two or three minutes at the utmost in this bath, with its minimum of gold, tones of a very vivid brown red are obtained. After washing, immerse the prints for five minutes in a sulphocyanide bath—3½ drachms of sulphocyanide of ammonia to 1½ ounces of water. The fixing by sulphocyanide of ammonia is superior to hyposulphite of soda, especially for the red and brown tones. Wash again in one or two changes of water, then complete fixing by a five to ten minutes' immersion in a hypo bath: strength, $\frac{1}{2}$ ounce of hypo crystals to 60 ounces of water.

No. 2.—FOR BLACK TONES.

After washing, immerse the prints in the following bath:—

Distilled water.....	2½ ounces.
Chloro-platinite potassium	2 grains.
Lactic acid (acid of milk)	$\frac{3}{4}$ to 1 drachm.

According as more or less of the lactic acid is added, the results are from a warm black (dark brown) to cold bluish tone. Wash the prints in several changes of water and then fix.

Some excellent testimonials as to the qualities of the prints and their permanent nature are published.

DIE CHEMISCHEN VORGÄNGE IN DER PHOTOGRAPHIE.

By Dr. R. LUTHER.

Wilhelm Knapp, Halle a/S.

This work forms Volume XXXVI. of Wilhelm Knapp's well-known *Encyclopädie der Photographie*, and consists of six lectures on the chemical processes of photography, delivered by the author at Leipsic. They are written in a popular style, and, being characterised by great lucidity, will be very valuable to those who wish to know something of photography in its chemical aspects.

DEUTSCHER PHOTOGRAPHEN-KALENDER. TASCHENBUCH UND ALMANACH FÜR 1900.

Verlag der Deutschen Photographen Zeitung, Weimar.

THIS is a very handy reference pocket-book for German photographers, issued under the editorship of Herr K. Schwier. The collection of formulae is very extensive and good, and considerable care has been bestowed upon the table of chemical compounds. The peculiarities of English weights, however, seem past comprehension abroad. If German photographers take the pound avoirdupois according to the components given in the book, they will be hopelessly muddled, as the drachm is said to consist of three scruples of seventy grains each.

THE "RAY" AND "KORONA" CAMERAS.

Agents: A. E. Staley & Co., 35 Aldermanbury, E.C.

For some time past Messrs. Staley have possessed the agency of several makes of American cameras, and at the present time they hold a very

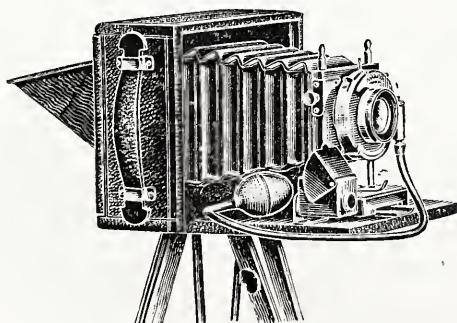


FIG. 1.

considerable stock of them to meet the demands that may be safely anticipated in the season now imminent. Whether regarded as instru-

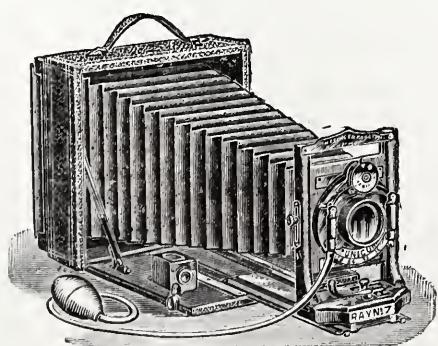


FIG. 2.

ments for taking photographs or as products of mechanical ingenuity, one cannot help admiring these cameras. They are compact and in-

expensive, and as regards movements are adapted for most kinds of work the ordinary amateur is likely to undertake. Both the series named at the head of this notice (figs. 1 and 2) are supplied with three double dark slides, achromatised single lenses, time and instantaneous shutters. They are well covered in leather and neatly finished. A feature is made of an extensible Korona for long-focus work. The Ray Special (fig. 3) is made

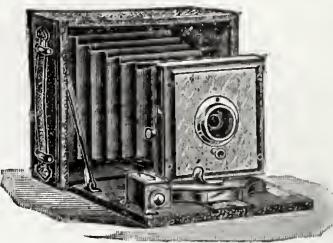


FIG. 3.

of pine wood, covered in leather. It is adapted to take daylight cartridge-holders as well as dark slides; has a Bausch & Lomb single lens, with time and instantaneous shutter; reversible view-finder and focussing scale; polished brass fittings; three double dark slides, and a case. This camera is sold for 35s. complete. All these instruments are excellent value for the money, and are of a kind to successfully appeal to many amateurs.

THE "LUXIA" PRINTING PAPERS.

Manufactured by Berger & Co., Southill Works, Hampstead, N.W.

To the list of printing papers for which they are steadily gaining an excellent reputation, Messrs. Berger & Co., have recently added the manufacture of bromide and "gaslight" photographic printing surfaces. The first-named is issued in six varieties: smooth slow; rough slow; smooth rapid; rough rapid; enamel surface slow; enamel surface rapid. The "gaslight" paper is in three varieties: smooth matt; rough matt; enamel surface. From an examination of the samples sent us we conclude that the "Luxia" papers are very carefully made and are capable of giving exceedingly good results in these methods of photographic printing and enlarging. We append the substance of the makers' instructions for working the papers; but it should be added that in addition to the formulae mentioned the papers work well in amidol, adurol, or any of the usual developers:—

Bromide Papers.—With negatives of average density, expose the slow paper for about thirty seconds at twelve inches from the flame of an ordinary No. 4 gas burner, and the rapid paper for about five seconds at the same distance.

Development.—The following developer is recommended as being clean, economical, and thoroughly under the worker's control:—

Sodium sulphite crystals.....	1 ounce.
Water (boiled)	20 ounces.
Sodium, carbonate crystals.....	1 ounce.
Hydroquinone	60 grains.
Metol	10 "
Potassium bromide	5 "

For use, add 1 ounce of above to 2 ounces of water.

Before developing, dip the exposed paper into water for an instant to prevent bubbles forming on the surface. Several prints in succession may be developed in the same solution. Immediately development is complete, immerse the print for a minute (without previous washing) in a little of this clearing solution:—

Glacial acetic acid	1 ounce.
Water.....	80 ounces.
Common salt.....	120 grains.

Then, after well rinsing, place the print for ten minutes in the following fixing bath:—

Hyposulphite of soda	4 ounces.
Water	20 "

Gaslight Paper.—This paper may be unpacked, placed in the printing frame, removed, developed, &c., at a few feet from the subdued flame of any ordinary gas or lamp light. It is only necessary that the direct rays of light should be screened off by the worker's back being kept opposite the flame so as to throw a shadow upon the paper during the above operations.

Exposure.—With average negatives, expose for about thirty seconds at two inches from the full flame of an ordinary No. 4 gas burner.

Development, &c.—Precisely the same as for Luxia bromide paper (see above), except that the work may be freely done, as already described, in ordinary gas or lamp light, of which sufficient may be used to enable the worker to see with comfort.

News and Notes.

PHOTOGRAPHIC CLUB.—February 7, at eight o'clock, lecture by Mr. H. J. Klosz, "A Holiday in Norway."

AFTER February 20, Mr. Theodore Brown's address will be the Stereoscopic Supply Stores, 34, Castle-street, Salisbury.

THE Earl of Crawford, who was in town last week to attend the wedding of his son, Lord Balfour, has returned to Naples to pass the remainder of the winter.

ROYAL PHOTOGRAPHIC SOCIETY.—On Tuesday, February 6, at eight p.m., Mrs. Catharine Weed Ward will give a lecture entitled "Shakespeare at Home," illustrated by slides from her own photographs. Ladies are specially invited.

EALING PHOTOGRAPHIC SOCIETY.—The next meeting of this Society will be held at the Public Buildings, Ealing, W., on Monday, February 5, at 8.15 p.m. Lantern Evening. Subject, "A Cruise to Northern Capitals," by Mr. T. Simpson.

KODAK (Limited) will shortly place on the market a print-out sepia paper, which is described as giving warm brown shadows and half-tones, with mellow, creamy high lights. The prints are said to be especially effective when made from broad, sketchy negatives. The paper is about three times as rapid as blue paper. It is developed by washing in plain water and fixed in hypo; short fixing gives red tones, longer fixing brown tones.

THE GOLDSMITHS' INSTITUTE CAMERA CLUB, NEW CROSS, S.E.—A popular lecture will be delivered in the central hall of the above Institute on Thursday, February 22, at 8.15 p.m., by Mr. F. O. Bynoe, entitled "The Camera, an Instructive and Amusing Companion." The lecture will deal with the various phases of camera work, including the hand camera in modern warfare, and will be magnificently illustrated with limelight views, diagrams, and mechanical slides. Tickets and programmes free of the Hon. Secretaries, or of the principal City photographic dealers.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—At the Annual General Meeting the election of officers resulted as follows:—President: Mr. J. T. Middlemore, M.P.; Vice-Presidents: Messrs. J. F. Hall-Edwards, L.R.C.P., F.R.P.S.; C. J. Fowler, F.R.P.S., E. C. Middleton, and T. W. Robinson.—Council: Messrs. C. S. Baynton, P. W. Brown, W. T. Greatbatch, F.R.P.S., W. W. Hollingsworth, J. Hewitt, F. Lewis, T. Taylor, and E. Underwood.—Lanternist: Mr. B. Moore.—Hon. Librarian: Mr. G. Whitehouse.—Hon. Treasurer: Mr. Richard Hames.—Assistant Hon. Secretary: Mr. Lewis Lloyd.

THE COLOUR SENSE IN MAN.—Dr. Rikers dealt with the colour sense in the second of his series of lectures at the Royal Institution last week. His investigations among the savage tribes of Torres Straits and Australia tended to prove that there had been, within historic times, a development of the colour sense; but, whether that were so or not, there certainly had been a development of colour language. It was in 1858 that Mr. Gladstone drew attention to the vagueness of the colour terminology used by Homer, who seemed to appreciate little more than the differences between bright and dark colour. In hardly any of the ancient literatures, indeed, was there a term for blue; and this coincided with investigations made among savages, who under "black" included all violets and blues.

MR. W. HOLT, of Fairholme, Manor-road, Barnet, sends us proofs from process blocks, illustrating his new patent vignetting machine, of which he also supplies the following notes: The copy is placed on the board, and, after regulating the size of vignette required, the machine is set in motion, with the result that a perfectly natural, graduated, vignetted negative is obtained without any artist's work on copy. I claim several advantages for vignettes executed in this way, the principal being the absence of the snow effect so pronounced when obtained by the air brush; second, the varnishing away of the picture where the actual white begins; third, any subject can be treated with this machine. Water colour, copies with black backgrounds, any squared-up subject or oval can be vignetted to look most artistic by its aid.

DEATH OF A PHOTOGRAPHIC PIONEER.—Just as the fleeting hands of time indicate the approach of the centenary of Fox Talbot, one of the pioneers of photography, on Wednesday week, passed into that bourne from which no traveller returns; in other words, the Rev. Dr. Graham, minister of the parish of Errol, died on January 24 at the advanced age of eighty-two years. For over forty years he attended, unaided, to the spiritual wants of the parish, but two years ago declining vitality told its tale, and an assistant was appointed. Before his induction at Errol he was for a number of years minister of Abernyte, and here he enjoyed the friendship of Lord Kinnaird. In the early days of photography Sir David Brewster, brimful of the new discovery, paid a visit to mine host of Kinnaird Castle, and while resident there Sir David received further details of the new discovery, that was then the topic of conversation in scientific circles. With that insatiable desire for knowledge that is inseparable from scientific men, it was determined to experiment in the new-born science. Lord Kinnaird, himself a scientist of no mean reputation, was well acquainted with the scientific leanings of the parish minister, sent for the worthy parson, and the three enthusiasts forthwith began their experiments. The privacies of the domestic apartments were invaded, and pails, tubs, and all sorts of receptacles were pressed into the service to assist in the work. After the departure of Sir David Brewster, the two local men continued their investigations. Dr. Graham had prior to this date made a hobby of optics; this leaning was particularly useful in the new pursuit, and the doctor made and ground the necessary lenses. Up to the present time the old doctor has taken a deep interest in photography, although for a considerable time past he has ceased to practise it. His collection of lenses, mostly all made by himself, is a very fine one, and his intimate knowledge of the earlier struggles of the art made his "crack" highly interesting to the photographer of to-day. A kindly, genial man, his death will be a sad loss to his congregation and the district in which he laboured.

Commercial Intelligence.

MR. W. D. WELFORD has commenced business at 19, Southampton-buildings, Chancery-lane, W.C., as a manufacturer of photographic preparations-developing and toning solutions, cloud negatives, vignettes, printing sets, &c.

MESSRS. WELLINGTON & WARD, of Elstree, announce that the Wellington film is now ready. The following are the prices: Cut films, quarter plate, 1s. 2d.; 5 x 4, 1s. 8d.; half-plate, 2s. 6d., &c. Daylight spools (twelve exposures), 2½ inches, 1s. 3d.; 3½ inches, 1s. 6d.; 4 inches, 2s. 3d., &c.

MESSRS. TAYLOR, TAYLOR, & HOBSON, of Stoughton-street Works, Leicester, inform us that many requests reach them to fit their Cooke lenses to Kodaks and other American cameras. They add: "It is found that the comparatively dull light of the English climate necessitates, for many purposes, a lens of larger aperture than these cameras possess." Messrs. Taylor, Taylor, & Hobson have decided to make a speciality of the work of refitting such cameras with Cooke lenses, and they are issuing a price-list for this work.

Patent News.

The following applications for Patents were made between January 15 and January 20, 1900:—

ANIMATED PHOTOGRAPHY.—No. 922. "Improvements in or relating to Apparatus which Photograph and Reproduce Moving Scenes." A. ST. V. BURNABY.

COATING APPARATUS.—No. 994. "Improvements in Apparatus for use and in connexion with the Coating of Photographic Films and Plates with Sensitive Emulsions." C. E. HEARSON.

CAMERAS.—No. 999. "Improvements in or relating to Photographic Cameras." H. B. SHARP and H. C. HITCHMOUGH.

BALLOON PHOTOGRAPHY.—No. 1060. "The Automatic Photo Detective Balloon." C. H. H. TIFFIN.

VIGNETTER.—No. 1108. "A New or Improved Vignetter." Complete specification. A. MAURICE.

SHUTTER.—No. 1187. "An Improved Photographic Shutter." A. J. E. HILL.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
5.....	Bradford Photo. Society	{ A Mountain Experience. Alex. Keighley, F.R.P.S.
5.....	Cripplegate Photo. Society	Annual Meeting.
5.....	Ealing	{ A Cruise to Northern Capitals. T. Simpson.
5.....	Glasgow and West of Scotland	{ Demonstration: Bromide Eulorizing. J. W. Reoch.
5.....	Kingston-on-Thames	{ Practical Colour Photography for Amateurs. A. E. Smith.
5.....	Southampton	{ The Pictorial Treatment of Lantern Slides. J. H. Hodges, F.R.P.S.
5.....	South London	{ Demonstration: Gravura Paper. A. C. Baldwin.
5.....	Stafford Photo. Society	{ Demonstration: Gravura Paper. O. C. Hackett.
6.....	Bristol and West of England	{ Elementary Technical Instruction Meeting. Silver Printing. H. O. Isaac.
6.....	Glasgow and West of Scotland	Exhibition Open to the Public.
6.....	Gospel Oak	{ Demonstration: Platinotype Process. Platinotype Company.
6.....	Hackney	Enlarged Negatives. H. W. Bennett.
6.....	Redhill and District	Animal Photography. J. O. Grant.
6.....	Royal Photographic Society	{ Shakespeare at Home. Mrs. Catherine Weed Ward.
7.....	Borongh Polytechnic	{ Belgian Street Life. Walter D. Welford, F.R.P.S.
7.....	Edinburgh Photo. Society	{ The Composition of a Picture. H. J. Dobson, R.S.W.
7.....	Photographic Club	A Holiday in Norway. H. J. Klosz.
7.....	Southsea	Annual General Meeting.
7.....	Woodford	{ Some Practical Hints for Photographers in Pictorial Composition. J. T. Ashby.
8.....	Camera Clb	{ Steam Turbines, Land and Marine. A. A. Campbell Swinton, M.I.C.E., M.I.E.E.
8.....	Darwen	Venetian Pictures. James Shaw.
8.....	Liverpool Amateur	{ On and Off the Beaten Track in Belgium. Dr. J. W. Ellis.
8.....	London and Provincial	Lantern Night.
8.....	Oldham	Italian Cities. James Shaw.
9.....	Ashton-under-Lyne	Elementary Photography Class.
9.....	Borough Polytechnic	{ Practical Evening: Improving Defective Negatives.
9.....	Bristol and West of England	Astronomical Photography. Llewelyn N. Tyack.
9.....	Croydon Microscopical	Photographic Chat.
9.....	Stafford Photo. Society	{ Demonstration: Secco Films. Representative from Secco Films, Ltd.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 25.—Mr. A. L. Henderson in the chair.

With reference to the question of the relative exposures required for backed and unbacked plates, Mr. A. J. BROWN said it was well known to old wet-plate workers that, if one were short of time and the plate required a little

more exposure than could be given in the ordinary way, it was usual to back the plate with white paper. This expedient tended to quicken the plate, although strictly the effect was merely to add the reflected light.

The CHAIRMAN mentioned a dodge, which was not generally known, of preventing halation. A plate that has been as evenly coated as possible is placed in contact with the plate upon which the exposure is to be made, film to film. The exposure is made through the additional plate, allowance being made for interference with definition by the intervening layer of glass and sensitive film. There seems to be no diminution of definition, and a plate exposed under the protection set forth, even to an interior subject with great contrast, would exhibit no signs of halation. The exposure, of course, is prolonged. The protective plate may be used for the same purpose again and again if not developed. By using a highly restrained developer, however, even this front plate may be developed satisfactorily, the result, of course, being a reversed image, which has its advantages.

Brixton and Clapham Camera Club.—January 16, Eleventh Annual General Meeting, Mr. J. W. Coade in the chair.—The report of the Council was read, showing the Club to be in a far more satisfactory state than last year, its position and prospects better and brighter. The membership had increased, and the financial position was good, with a balance to the credit of the Club, large assets, and no outstanding liabilities. The thanks of the Council were tendered to those who had supplied the excellent series of papers, demonstrations, &c., during the year. The Council also expressed their satisfaction at the increased attendance at the Club meetings. The election of officers for the current year was declared as follows:—President: Mr. W. E. Dunmore.—Vice Presidents: Messrs. J. W. Coade, W. Fraser, and F. W. Levett.—Council: Messrs. A. R. Clench, R. Fisher, L. E. Mongiardino, W. H. Stoneman, and W. Redman.—Librarian and Curator: Mr. L. W. R. Cundell.—Lanternist: Mr. R. G. Mason.—Hon. Secretary: Mr. R. McKinley Milne, 77, Atlantic-road, Brixton.—Assistant Secretary: Mr. L. E. Mongiardino. Votes of thanks to the retiring Committee were carried. The recommendation of the Council that an Exhibition should be held in March next was discussed and adopted, substantial support being guaranteed by the members present. Mr. Dunmore, on his election, addressed the members, asking for their hearty co-operation and support in maintaining and increasing the position of the Club.

Hackney Photographic Society.—January 23, the President in the chair.—Mr. HUDSON showed some lantern slides developed with metol, to which had been added some hypo solution. A very good brown tone was the result. One of the best lectures that the Society has ever had was that given by Mr. R. CHILD BAYLEY on the subject of

SOME RECENT DEVELOPMENTS IN PHOTOGRAPHY.

The potassium-permanganate reducer, discovered by Dr. Namias, and Mr. Ferguson's copper ferricyanide toner were both successfully demonstrated and shown to be very valuable aids to the photographer. Mr. Bayley also dealt with developing after fixing, the theory of the latent image, hand-camera work and its associated subject, enlarging, and, finally, with the development question.

FORTHCOMING EXHIBITIONS.

1900.	
February 10-24	Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.
" 24-March 3	Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley.
March 3-10	South London Photographic Society. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh Hill, Blackheath, S.E.
" 26	Twentieth Century International, Birmingham. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.
" 26-31	Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin.
April 3-7	Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE MANUFACTURE OF CINEMATOGRAPH FILMS.

To the Editors.

GENTLEMEN,—Our attention has been called to an inspired article in the *British Journal of Commerce* in which it is erroneously stated that our film factory at Walton-on-Thames is under the control of the Warwick Trading Company. This mistake has obviously arisen from the fact that we do a very large proportion of the film work of this company,

while they handle the bulk of the output of our own series of "Hepwix" films. We are fully sensible of the honour done us by the coupling of our name with that of a firm the quality of whose work is well known to be second to none, but we feel it to be only due to ourselves and in justice to the trade generally to contradict the impression conveyed—doubtless inadvertently—and to state that we are not connected in any way whatever with this or any other firm.

We should also like to point out that the patent developing machine—which is also credited to the same Company—and by virtue of which alone it is possible to develop and print from negatives of 1500 feet in length in one piece, is in reality part of the equipment of our Walton factory, and we are sole possessors of the entire patent rights.

We are equally certain that the Warwick Trading Company would be the last to wish to convey an erroneous impression, and the first to desire that it should be corrected if by any accident it should gain currency.

Apologising for thus trespassing upon your space, and thanking you for the courtesy which permits us to do so,—We are, yours, &c.,

Walton-on-Thames, January 23, 1900.

HEPWORTH & CO.

AMMONIUM PERSULPHATE FOR REMOVING PYRO STAINS.

To the Editors.

GENTLEMEN.—A large proportion of your readers adhere to pyro, the good old developer which I prefer, but, like myself, object seriously to resultant staining of the hands. For the benefit of such I beg leave to state personal experience. I do not claim a discovery. Some months ago I saw, in one of the JOURNALS, the suggestion of the use of ammonium bisulphite made into a paste with water. Obtaining one ounce from a prominent manufacturing chemist (who was unable to state whether or not it was applicable to the purpose, or as to its stability in solution) I dissolved in six ounces of distilled water. Since, my custom has been, when having completed development and put the dark room in order, to thoroughly wet the hands, pour a thimbleful, or less, of the solution in the palm of the left hand, put the fingers of the right hand into it and work down the fingers of both hands. With me the result has been most satisfactory, the stains proving rapidly fugitive. The quantity used is so small, that at three months from the date of preparation of the solution the bottle is not exhausted, and that it remains effective is a guarantee of its stability. I should add that I have not tested its efficiency for stains of more than a few hours' duration, nor for those which have been exposed to daylight.—I am, yours, &c.

J. HARMANUS FISHER.

16 South-street, Baltimore, January 12, 1900.

ARTICLING PUPILS IN PHOTOGRAPHY.

To the Editors.

GENTLEMEN.—Your reply to "Guardian," in Correspondence, I very much admire; but why not go a little further, and advise him to invest the £50. in a studio and apparatus all complete? then, with a few packets of plates and paper, some ready-mixed developer, &c., &c., the youth would be able to start as a professional photographer, without wasting three years and £50., and no doubt by next year we should have the pleasure of seeing some of his work in the Salon, and an article or two written by him specially for THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1901, such as "A Use for Over-exposed Bromides," or "Will Backing a Plate shorten or lengthen Exposure?"—I am, yours, &c.,

11, Knowsley-street, Bolton, January 24, 1900.

A. WEBER.

To the Editors.

GENTLEMEN,—Nothing to learn indeed! I can only say that, after my son had learnt his business here well, I should, a few years ago, have been very willing to pay a hundred guineas to learn what he could at any first-class London or large town house, simply to be there six months and keep his eyes open! It is quite true that bricklaying often pays better than photographic assistantship, but the mere knowledge of how to lay a brick does not make a bricklayer, he must practise. While, on the other hand, I'll turn out a photographer in two hours after his first lesson; but I won't pay him a cent for his services. I want a man who knows his work, knows good work when he sees it, and can remedy matters when he or his subordinates get wrong. I want a man used to handling things, who can do his work deftly and quickly, and it wants a precious lot of practice to do that, I assure you, and to know and be able to fulfil the requirements of a first-class portrait studio. One of my old apprentices paid fifty guineas as improver, though he had already paid me a hundred. His employer says he is the best trained hand he has had. So much for the value of training. I don't say a word about whether photography, as a profession, is worth taking up "that is another story."

I am, yours, &c.,

PHOTOGRAPHER.

To the Editors.

GENTLEMEN,—Many photographers will be pleased you have again touched upon the question of premiums. Though I fully endorse much you have said, I fear you miss the point from which the cause of much of the depression emanates. With your permission I should like to state my own views, which may not in every way coincide with yours, but are

the opinions of one who charges a premium. Taking the question of remuneration first—in the advertisement you quote “Operator and Retoucher, quick and good. Open Sundays. Wages, 21s.” What the advertiser would consider good would probably be considered very bad in a good-class studio; but surely such men do not charge premiums. There are unquestionably a great number of duffers in the trade, and it is here where the shoe pinches. The labour market cannot be said to be overstocked with clever men. As an example, last year I had occasion to advertise three successive weeks for a retoucher; the first week brought me three replies, the following two weeks I had about half a dozen more. Judging by their specimens, there was only one I should have cared to make shift with—his terms were 35s. per week; he wired later to say he had been engaged in the mean time. I answered all advertisements, and scarcely any replied to my letters, by which I concluded they also had been engaged before my letters had reached them. Now, the only reason I can assign for the great number of duffers in the trade is that so many people are under the same wrong impression as yourself, i.e., “that there’s so little to learn in photography now that everything is supplied ready for use, with full directions for using them.”

I once knew a young mechanic (who for some reason had been out of work for some time); he took up photography, and persevered with it until his friends flattered him his work was as good as anybody’s in the town; he then opened a studio; he did his best, I will give him credit for that, but, for the want of that knowledge which is not printed on the instructions with the goods we buy, he went to the wall. I believe he is now an assistant in some small studio at a starving wage. His experience, for which he has paid so dearly, is of no value to his employer.

Every parent or guardian apprenticing a youth to photography should have a full understanding what is to be taught. Operating (that means assisting the operator in the studio), dark-room work, enlarging, printing, mounting, and working up enlargements in black and white, should all be stipulated. The term of apprenticeship should not be less than three years, and, as his services during that time are not of much value to his master, it is only to be expected a premium will be required, the greater portion of it being returned in the way of salary or pocket-money, optional according to circumstances. Another vital point is that all complaints of indolence or carelessness should be made at the time to the parents; it is mistaken kindness to the youth not to do so. Then, if, when his time is up, he is not worth a journeyman’s wage, I should say the fault lies with him.—I am, yours, &c., J. W. BEAUFORT.

Colmore-row, Birmingham.

FREAK PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Reading THE BRITISH JOURNAL OF PHOTOGRAPHY, January 19, 1900, I see in Correspondence, under the heading of “Freak Photography,” A. Levy speaks of a friend of his taking some photos on a Kodak film, and a clerk or dealer (by mistake) changing them for a new reload. He then says that a future customer, after taking twelve more pictures on the before exposed reload, would be surprised to find double photos. This could not be the case, as Kodak films, after being rolled off once, cannot be rolled back on again, as the latter end of the film is not attached to the black cover paper, also the word “exposed” is stamped in white on the end of each spool. Could you in your next issue let A. Levy know of this, you will oblige.—I am, yours, &c., W. BLOOMFIELD.

14, Guildford-road, Tunbridge Wells, January 24, 1900.

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—I read with much pleasure “Free Lance’s” dissertations as regards the metric system. He seems to ignore that a kilogramme is divided here into two pounds, and that a Frenchwoman buys just as easily here as an Englishwoman in England one pound of bread or half a pound of coffee (more used here than tea), and she asks just as easily for one quarter pound of butter, and if she does not say one-eighth of a pound, nor 125 grammes, she knows how to ask for half a quarter of a pound. I fail to see why the English pound has more adaptability to subdivision than the French pound.

Outside of this little explanation I feel not the slightest concern about England using the easy kilogramme as against their much easier and less complicated measures and weights, called miles, yards, feet, inches, or their stones, pounds, ounces, drams, scruples, grains, minims, which are simplicity itself, even when they are divided again into avoirdupois and troy.—I am, yours, &c., A. LEVY.

Asnières (Seine), January 24, 1900.

PARIS EXHIBITION, OR ENGLISH EXHIBITION.

To the Editors.

GENTLEMEN,—In your issue of January 19, 1900, the Paris International topic is again creeping up. The closing time for application to

exhibit at the same was August 1898, and only now is the fact leaking out that two prominent amateurs have the sole right to select from among their friends (therefore not restricted to applicants) the material for making a representative show of English photography. Where are you now, you poor professionals? Even if you applied for space at the proper time, you are not considered worthy to receive even courteous treatment. After such a slap in your face, I trust the few professional photographers who have attained the amateur standard, and are invited to exhibit, may politely decline, as a protest against the treatment meted out to a body of respectable, hard, and honest workers.

For some years we have had a fortnightly review of amateur work, which are not much good to the professional. Would it not be possible to hold a national, or even international photographic exhibition this year for professional photographers and applied photography, naturally with prize competitions, say two per cent., first diplomas; ten per cent., second; and twenty-five per cent., third class?

You will say we had one two years ago. Yes, it was a nice show of plates, paper, apparatus and other material, little huts and kiosks, a lot of ancient photographs, with a small amount of modern photographs from nearly a dozen professional photographers. We want a show representing 500 photographers, don’t we?

Who will take the lead in starting such an enterprise? I feel sure our Editor, and worthy champion for professionals, will act *ad interim*; therefore all those who are eager to show in the above way what the professional can do should write a letter of support to him, and, if our Mr. Bedding sees there is support, he would arrange a constituency meeting of the would-be exhibitors, at a London terminus, to elect an acting committee.—I am, yours, &c., OTTO PFENNINGER.

Brighton, January 27, 1899.

“THE ABSENT-MINDED BEGGARS.”

To the Editors.

GENTLEMEN,—Our respected and esteemed townsman, Dr. Hall-Edwards, so well known as a skilful amateur photographer and as an expert in X-ray work, has been commissioned by Government to go to the front for hospital work.

Dr. Hall-Edwards is appealing for donations of suitable apparatus and photographic materials, and informs me he is in special need of a good dynamo to light the operating theatre. Now, I feel sure there are hundreds of photographers who will be ready to help in this object, and who, not being able to fight, will be willing to “pay, pay, pay.”

I will give twelve quarter-plate Tit Bit hand cameras to be distributed among those who contribute 1s. to enable me to accomplish my design, and I will find all the necessary clerical work involved to carry it to a successful issue.

A friend has already promised to supply all the printed receipts free of cost.

To every one who sends twelve penny stamps and a directed and stamped envelope a printed receipt bearing a number will be sent. This receipt must be kept, and in the first March issue of the photographic paper where you saw the notice a list of twelve numbers will be published by the courtesy of the editors. Any one holding a receipt bearing one of these numbers will be entitled to receive a Tit Bit camera free on application.

A committee of well-known Birmingham gentlemen will be formed to see that the drawing of the numbers is carried out in a proper manner.

In Birmingham a safety bicycle offered in this way realised 260!. It will be interesting to know what the twelve Tit Bits will realise. If the sum is a large one, then I propose to divide it in two portions, and devote half to the photo-medical staff requirements and half to one of the funds for the relief of “those Tommy has left behind him.”

Address your letter clearly—“The Absent-Minded Beggar Fund, W. Tylar, 41, High-street, Aston, Birmingham.” Hurry up your shillings, please, and let the postman flood us at every post; let the world see what the photographic section can do.—I am, yours, &c., W. TYLAR.

41 High-street, Aston, Birmingham.

[We trust Mr. Tylar’s laudable efforts, which have for their object the alleviation of the pain and suffering caused by the War, will be heartily seconded by our readers.—EDS.]

FOGGED PLATES.

To the Editors.

GENTLEMEN,—I am much interested in your letters on foggy plates. I have had another such a Christmas as H. C., with whom I sympathise; but, instead of fog around edges, my plates were fogged all over in patches. As they were fresh from maker, I returned an unopened box, and they admitted the fact, and, I am bound to say, very kindly sent me new plates for all the faulty batch I had free of expense.

Re dealers, last year I had a box of plates sent me that were totally fogged. On inquiry of the plate-maker, I discovered they were made in May 1891.—I am, yours, &c., OTHELLO.

THE THORNTON GLASSOLINE FILM.

To the Editors.

GENTLEMEN,—I read with interest your notice of the Thornton Film Company prospectus in the current JOURNAL, and as one of the existing celluloid-film makers, and as the introducer of "Setoloid," I thank you for the fairness of your criticism. I am so used to seeing the existing films condemned in each new prospectus, and the condemnation copied into the photographic papers, that your innovation comes with a pleasant shock.—I am, yours, &c., AUSTIN EDWARDS.

Photographic Film Works, Warwick, January 27, 1900.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED :—

W. B. Samuel, 7, Claylands-road, Kennington, S.W.—Photograph of Princess of Wales Theatre, Kennington.

W. H. Bustin, The Studio, Palace-yard, Hereford.—Two photographs of the Bishop of Hereford in his study. Photograph of a bull.

J. A. Horsburgh, 4, West Maitland-street, Edinburgh.—Photograph of the Right Hon. J. B. Balfour, Lord Justice-General of Scotland.

SEPIA BROMIDE.—The tones you require may be obtained by means of the uranium bath. For formulæ see the Formula Section of the ALMANAC for 1900.

RECEIVED.—PROFESSIONAL ; STUDIO ; CENSUS ; W. T. DRAY ; COL. MITCHELL ; K. ; E. J. H. ; ENQUIRER ; CONSTANT READER ; and many others. These will be answered in our next.

SUBSCRIBER.—We fear that you will find it an impossibility to remove the image without affecting the support. Aqua regia (nitro-hydrochloric acid) is a solvent of the platinum, but it would also attack the paper.

APPRENTICE.—We believe that you must conform to the hours prescribed by your employer. There is no recognised rule as to hours in the profession. If the matter is of importance to you, we should advise you to consult a solicitor.

C. R. (Spalding).—1. The tones you refer to are obtained by using suitable negatives and implicitly following the printed instructions. We imagine that you have erred in these respects, but it is impossible for us to guess to what extent.

T. KING.—1. Use orthochromatic plates and a screen and you will find no difficulty in securing clouds in your negatives. It is such a simple matter that you do not require any further hints. 2. Much obliged for the enclosure; we retain it for reference.

VICTOR SELB.—We doubt if you will easily obtain such a lamp. Mr. Pringle, in the last edition of his book on *Optical Projection*, states that the Swan-Edison Company (address, Parliament-street, London) makes a special form of lamp for projection purposes. A letter to the Company would bring you further particulars.

PORTABLE STUDIOS.—M. E. BRADFORD writes: "Will you tell me to whom to apply for particulars as to dimensions and price of Herr Schaefer's portable studio?"—In reply: We are unable to say if the apparatus, which is of German origin, is on the English market. Some reader may possibly supply the desired information.

COPYRIGHT.—T. ERWIN asks: "Can I prevent the editor of a certain illustrated paper publishing some unregistered photographs of mine without express permission from me? The photographs I gave gratis to a customer of mine, who in reply to a letter from the said editor sends on the photographs."—In reply: Without registration you have no legal protection of your photograph.

A COPYRIGHT QUESTION.—EXCELSIOR says: "A client has been photographed with a certain article in several positions, and I have discovered these positions are copied from a celebrated illustrated magazine. Am I liable under the Copyright Act, or is my client, or either?"—In reply: We think not. The mere imitation of a position scarcely amounts to a "copy" of a picture; hence, in our opinion, there is no infringement.

CELLULOSE COMPOUNDS.—R. T. WALL says: "I have written to Bevan & Cross to inquire for aceto-cellulose. They say they do not sell it commercially. In THE BRITISH JOURNAL OF PHOTOGRAPHY, December 8, 1899, I saw that tetracetate of cellulose and hydrate of cellulose are now produced on a large scale. I think hydrate of cellulose would suit me best. Can you advise me how to obtain it?"—In reply: We are sorry we cannot indicate the source of supply. Some chemical reader may, however, supply the information.

COPYRIGHT IN MUSIC.—CURATE writes: "I am getting up an entertainment in our village, and I propose to make lantern slides of two songs, with the music, to throw on the screen for the children to sing. The songs are marked copyright and must not be sung in public without permission. Would doing what I propose be considered an infringement? Does the copyright cover lantern slides made by photographic means?"—Yes, certainly; it would be illegal to do what you propose without the consent of the publishers.

DAN.—1. The ceramic process would give the most permanent results. 2. The picture should be protected from atmospheric influences. 3. Nothing better than cement. 4, 5, 6, 7. *Induction Coils*, by Alsop, published by E. & F. N. Spon, 125, Strand, and *Practical Radiography*, published by Dawbarn & Ward, 6, Farringdon-avenue, E.C., should be of service. 8. By unscrewing the back cell softened definition is obtained; probably the marks you describe have reference to this power. 9. Quite rapid enough for studio work. 10. We know of no such book. 11. Not yet.

STUDIO REPAIRS.—C. J. J. asks: "Whose place is it to paint the inside and repair the roof of the studio, the landlords or the tenants?" I took the place for three years, and the landlord painted it inside and out at the time. Now it has got very shabby and the roof leaks in places. The landlord says, if I now want anything done, I must do it myself. Can I compel him to do the needful, for it wants doing badly?"—It all depends upon the agreement. Unless it is stipulated that the landlord is to do the repairs, the tenant will have to do what he requires to be done. If it is for his comfort, and not for that of the landlord.

SULPHIDE TONING.—OTHELLO says: "I find I can get a nice chocolate tone on bromide prints by immersing them in a weak solution of sulphide of potassium (liver of sulphur) all night. What I should like to know is, Do you consider the resulting effect permanent, or as permanent as the black bromides? I never read of this plan of toning bromides, but should imagine it too simple to be novel. What is your opinion on this point?"—In reply: If the prints have been thoroughly washed and fixed, the result should be permanent. Silver sulphide is alleged by photographic chemists to be a very stable compound.

CINEMATOGRAPH.—1. The principal precaution to take is to avoid mixing the gases. 2. Yes; you may exhibit the pictures in the way mentioned—indeed it is very commonly done. As you state that you are a novice, and we cannot afford the space to answer you as fully as is necessary, we suggest that you procure and study a book on lantern projection work. For your purpose a little volume by Dr. Manton, published by Messrs. Iliffe, of 8, St. Bride-street, E.C., would be just the thing. It is published at 6d. or 1s. For the entertainment, write Messrs. Hepworth & Co., Walton-on-Thames. They may possibly meet your requirements.

RESIDUES.—"G" asks for the best way to throw the silver down from old hypo fixing solutions. Liver of sulphur, he says, is no good; is there any other way?—Although this correspondent says that liver of sulphur is no good, it is, in practice, the best and simplest material to use, and is the one universally employed. A current of sulphuretted hydrogen passed through the solution will throw down the silver, but that, though theoretically better, is less convenient than the liver of sulphur. If the hypo solution be boiled with scraps of zinc, or the zinc is left digesting with it for a time, the silver will be precipitated; but, as we have just said, liver of sulphur is the best in practice—that is, of course, assuming that the material is good.

STEREOSCOPIC PHOTOGRAPHY.—W. WILKINSON says: "I am greatly interested in the question of stereoscopic photography and attempts to produce stereoscopic effects on the screen. If you can give me particulars in next issue of any articles and where obtainable, you will greatly oblige. I have also read with keen interest your article in the ALMANAC for 1900. Can you please direct me where I can get, and price of, the following: 1. 'Binocular Vision and the Stereoscope' (footnote, page 643 of ALMANAC)? 2. Particulars of demonstration at the Camera Club by Mr. Knight, mentioned on page 664 of ALMANAC? 3. Also particulars re reflecting stereoscope, partly described on page 674, and illustrated at page 670, fig. 4, of ALMANAC?"—In reply: 1. The paper appears in THE BRITISH JOURNAL OF PHOTOGRAPHY for July 19, 1899. 2. The number of the Camera Club Journal containing the paper in full may be had of the Secretary of the Club, Charing Cross-road, for 1s. and postage. 3. The description referred to is the fullest published. See the JOURNAL of January 26 for diagram. Write again if we can be of further use in the matter.

TESTING THE SILVER BATH.—BURETTE says: "I have for some time past been dissatisfied with the argentometer, and have lately purchased a single burette for testing the strength of my silver bath, but I cannot find out exactly how to use it. I want a simple method of testing with a standard solution of salt, and shall be glad of your kind assistance. I may say that the burette is graduated in cubic centimetres and in tenths."—As the burette was sold as an argentometer, doubtless the formula for a standard solution for a chloride was supplied with it. Here is the method of quantitative testing given by Hardwick: Take pure, dried chloride of sodium in the proportion of 8½ grains to 6 fluid ounces of distilled water, each drachm of this will precipitate half a grain of nitrate of silver. This can easily be adapted to the burette you have, but it will be better to use the formula supplied with the instrument. At the photographic warehouses are sold argentometers for from one to two shillings each. They are simply hydrometers and are quite accurate for newly made silver solutions, indicating the grains per ounce. Theoretically, they are not strictly correct with solutions that have been much used, but, practically, they are accurate enough for all photographic purposes. They are what are almost universally used by photographers.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRA.

THE balloting papers for the election of officers and Council of the Royal Photographic Society for the ensuing twelve months were issued to members last week. They are returnable to the Secretary of the Society not later than noon on Monday next, February 12. As we mentioned last week, Mr. Dallmeyer is the only gentleman nominated for President, and is therefore elected. For the four Vice-Presidencies eleven gentlemen are proposed. Mr. Scamell is the sole nominee for the office of Treasurer, a position by no means of the nature of a sinecure. A Council of twenty has to be selected from fifty-one names appearing on the paper. On the whole, the somewhat formidable-looking balloting paper, with its great cloud of names, is indicative of a healthy interest on the part of members in the personnel of the executive responsible for the direction of the Society. Some familiar names are missing from the sheet, amongst them that of Sir W. de W. Abney, who, we regret to hear, finds himself unable to accept office in the Society this year.

* * *

THE ballot papers for the election of Judges for the Society's

Exhibition at the New Gallery next autumn have also been sent out, and are returnable, like those for members of Council, next Monday. In the Pictorial Section eighteen gentlemen are proposed, and from that number a choice of five has to be made. In the Technical and Scientific Sections there are six nominations and three names have to be chosen. The Judges' ballot paper does not this year contain so many names as last, when it will be recollect that, in consequence of the attention directed to the matter by this JOURNAL, the interest of members was so strongly aroused that, instead of a nomination list and ballot paper of only eight Judges, as in 1898 (just the number required), the ballot paper for 1899 contained a list of no fewer than nine names in the Pictorial Section and twenty-five in that of the Technical and Scientific Section.

* * *

THE editors of the *Photogram* are good enough to send us three excellent proof impressions from photogravure plates made by Fox Talbot in the year 1866. The subjects are French architectural studies, and the pictures are on plate-sunk mounts, thus rendering them suitable for framing. Through the courtesy of Mr. C. H. Talbot, the son of the late W. H. Fox Talbot, our contemporary is enabled to issue 100 prints from each of the plates, the proceeds from which, at 5s. each, are to go to the Fox Talbot Memorial Fund. The prints are being specially printed by the Art Reproduction Company, of Fetter-lane, E.C. The specimens before us are exceedingly well done, and, aside of their historical interest, are very good examples of a process which is universally conceded to be a most artistic method of reproduction by photography.

* * *

FOX TALBOT was born, just 100 years ago, on February 11, 1800. One may reasonably demur to his right to the title of the "inventor" of photography, which some of his more enthusiastic admirers would confer upon him, but there is no doubt that a comparison of his work with the silver salts on paper with that of Daguerre on sensitised silvered plates singles him out for the distinction of having laid the foundation of modern photographic negative and positive work. It would be rash to say that, but for Talbot, photography as we

know it to-day would not be in existence ; we can now perceive, by the light of recent knowledge, that the Daguerreotype, as General Waterhouse has reminded us, would have formed a very good starting-point in the evolution of photography by development ; still, it cannot be denied that, from whatever aspects they are studied, Fox Talbot's contributions to photographic progress must rank as the most important that have been made. Of the "fathers" of photography he is admittedly the greatest.

* * *

In connexion with Fox Talbot's centenary, the suggestion has been revived that a memorial to him, to take the form of the restoration of the chancel of Lacock Church, Wiltshire, should be instituted. With that object the Committee has been reconstituted, and it now consists of the following ladies and gentlemen :—The Right Rev. the Lord Bishop of Bristol ; Miss Awdry, Notton House, Lacock, Chippenham ; C. H. Talbot, Esq., the Abbey, Lacock, Chippenham ; J. E. Gladstone, Esq., Bowden Park, Chippenham ; Mr. E. Eyres, Ray Bridge, Lacock, Chippenham ; Mr. A. J. Tanner, Lacock, Chippenham ; the Rev. H. W. Armstrong, the Vicarage, Lacock ; Miss Talbot, Lacock Abbey ; the Rev. W. G. Clerk-Maxwell, Clunbury Vicarage, Shropshire ; Mr. T. Pike, Lacock. Subscriptions will be received by the Treasurer, Mr. C. H. Talbot, Lacock Abbey, Chippenham, Wilts, or they may be paid to the Fox Talbot Memorial Fund, Capital and Counties Bank, Chippenham, Wilts.

* * *

In their appeal the Committee state that, in 1878, immediately after the death of Fox Talbot, which took place on September 17, 1877, it was proposed to restore, or, more strictly speaking, remodel, the chancel of Lacock Church, as a memorial to him. Owing to unavoidable circumstances, the matter fell through at the time, but has never been lost sight of, and it is felt that the time has now come when definite steps towards the attainment of that object should no longer be delayed. There is at present no other monumental record of Fox Talbot than a short inscription on his gravestone in the Lacock Cemetery. With the chancel he was, as lay rector, intimately connected, and many of his ancestors, from the sixteenth century, including his father, are buried in a vault under the adjoining Lady Chapel. There is an obligation upon the present lay rector (Mr. C. H. Talbot) to keep the chancel in repair. The present chancel was rebuilt in 1777, and is in substantial repair, but it is incongruous and out of harmony with the rest of a large and fine church. To remedy this defect by local effort alone would demand a long time, but it is thought that an appeal may be made to the public, particularly those who are interested in photography, with some prospect of success. Plans have been prepared by Mr. Harold Brakspear, A.R.I.B.A., architect, which include the conversion of the chancel, the addition of an organ chamber, and the provision of the necessary fittings, at an estimated expense of 1000*l*. Any surplus that may be obtained would probably be applied to form the nucleus of a fabric fund, applicable to any part of the church or chancel, as the above-mentioned sum by no means represents the whole amount that might with advantage be expended on the fabric.

* * *

WE have been asked to recommend the memorial to the attention of our readers, and do so with much pleasure. Subscrip-

tions for the proofs from Fox Talbot's photogravure plates, to which we have already referred, should be sent to Mr. Snowden Ward, 6, Farringdon-avenue, London, E.C. Any contributions that may be forwarded to us for the Memorial Fund that is being raised at Chippenham will be duly acknowledged in these pages, and forwarded to the proper quarter. We especially commend the matter to the notice of those of our American readers who may be desirous of associating themselves with the proposed memorial to one of those fathers of photography whom we know to be regarded with especial reverence by numerous photographers in the United States.

COLLODION IN THE SILK LOOM.

COLLODION in its time has played many parts ; it is not half a century since it became the especial handmaid of photography through Archer's discovery, yet meanwhile it has been put to an infinite variety of uses, either in its own form or in modifications of its pyroxyline base. It is used in surgery, it forms an excellent varnish, is equally good as a lacquer, or as a waterproofing for paper and other substances. As for celluloid, mainly composed of pyroxyline, to name it is to bring before one a thousand forms, from the humble knife-handle or card of buttons which seemed its early fate, when known, after its inventor's name, as Parkesine, down to the present day in its use for the most expensive articles for personal use, and as a carrier for gelatine films in countless thousands the whole world over. Thirty or forty years ago we saw balloons made from collodion ; the inside of a glass carboy was coated with collodion, and, when dry, the delicate skin was deftly withdrawn, and then formed a splendid substitute for silk. Unlike the well-known indiarubber spheres, collodion balloons could be filled by simply placing them over a gas-burner, and turning on the tap till they were fully expanded.

This is, perhaps, the earliest recorded use of collodion as a substitute for silk—sufficient as a scientific amusement, but full of infinite horror of fire if used for purposes of dress. Yet to this end, after the lapse of four decades, has it come, but with a difference ; for, whereas the balloon silk was inflammable almost to explosiveness, the celluloid silk of the present day is as harmless, so far as fire dangers are concerned, as the natural product of the silkworm itself.

As regards this most modern use of collodion, the *Journal of the Society of Arts* lately had a full report of Mr. Joseph Cash's paper on artificial silk, which, as we have on former occasions informed our readers, is simply collodion spun out into minute threads as fine as the silkworm's web, then dried, and afterwards submitted to further treatment to remove the nitrogen, and thus destroy its explosiveness, this being the very essence of the process. A silk of ordinary collodion fibre would not be permitted for a single second, but denitrified would be welcomed with acclaim. Mr. Cash, in his paper, drew attention to the extreme care needed in the manufacture of the constituent pyroxyline, and stated that, even at the long-established factory of Besançon, in France, mistakes would, at times, occur. It seems to us that a little photographic experience might with advantage be applied to the process of manufacture as described in the paper. For instance, the gun-cotton was explained to be dissolved by placing in a cylinder with a mixture of ether and alcohol, which was then kept slowly revolving for twelve hours. Now, there is no secret in the best way of making a solution of the pyroxyline, seeing

that it has been published thirty years ago. It consists in first adding the alcohol to the pyroxyline, well wetting the latter with it, and then adding the ether. It must be an immense cylinderful that would not be dissolved in one-fourth of the time named. The method of filtration is good: the liquid is pressed, under a force of fifteen atmospheres, through cotton-wool imbedded between two sheets of calico. Again, it is stated that the quality of the gun-cotton cannot be discovered in a simple manner. It might be remembered that Hardwich, in his classical paper, pointed out that the amount of weight the raw cotton gained during the action of the mixed acids was, *ceteris paribus*, an exact criterion of its quality. Further, as old hands at the manufacture for photographic collodion-making, we may say that, when the fibre was in the washing water, we could, with our eyes shut, almost tell exactly what its quality would be like merely by handling it in its wet condition, a limpid collodion being produced when the cotton felt soft and velvety to the touch, and a craggy thick collodion when it felt harsh and wiry.

It appears that this material is the best to use for the manufacture of the mantles for the well-known incandescent gas burners, as the rare-earth salts that form the skeleton can be more readily introduced into collodion, and hence into the skeleton, than by any other means.

The amount of pyroxyline made may be judged by the output of the "silk"—Besançon 7000 lbs. per week; Sprietenbach, 3600—and extensions on a large scale are in progress to double this output. We are, in deference to popular etymology, using the terms gun-cotton and pyroxyline as convertible, but they really are not, for the former material contains a larger proportion of nitrogen than the latter, and is not soluble in ether and alcohol, as is the latter. The former may be termed tri- and the latter di-nitrocellulose. But, interesting to a photographer as must be this new industry arising out of the use of his old servant, collodion, and large as is the output already, we must confess we share with some of the members of the Society who took part in the discussion the feeling that such a mode of manufacture is a species of *pis aller*. First to impart nitrogen by a costly process to cellulose, afterwards dissolving the product in a costly liquid, and then to remove the nitrogen by another process, is a roundabout way of doing things. The moment a method is discovered for bringing into practical use one or other forms of what might be termed gelatinous cellulose—as opposed to fibrous cellulose—in such way as to enable it to be spun like this artificial silk, so soon would the present industry collapse, and its only value consist of the huge manufactories for its production, and these might be utilised for the new kind of cellulose silk.

The Coming Eclipse.—As the time approaches for the eclipse of the sun, the various arrangements made in different countries become known, and a wider co-ordination in consequence possible. On the part of France we read that Baron Pluvine has been over to Spain to investigate the probabilities in regard to meteorological conditions, and will have reported to the French Astronomical Society on the 7th inst. the results of his mission.

Few persons are aware of the amount of labour, care, foresight, and time given to the preparations for observing this wonderful phenomenon, and a recent illustrated account in *Nature* of the arrangements made in connexion with the eclipse observations at Viziadurg in 1898 will be found most interesting. Photographs are given of the six-

inch and the nine-inch prismatic cameras, and of the kinematograph and its special hut. As need not be said, photography plays an ever-increasing part in these eclipse-observation undertakings; indeed, if it were not for photography, our knowledge of the sun would be far less than it now is. At these expeditions everything is more thoroughly rehearsed than at a dress rehearsal at the theatre. Each observer has one definite work to perform at a definite time, and he practises at it till he is perfect. As an example of the thoughtfulness shown, it may be noticed that the plans were laid so that the most important observers only "worked half-time," i.e., when the eclipse was half through, their duties ceased, and they would not be deprived of the interesting opportunity of actually viewing the eclipse after having travelled so far.

United States Naval Observatory Report.—This report, for the year ending June 30, 1899, has been issued. We note that the result of many measurements made with the great twenty-six-inch equatorial has been to show that the irradiation error observed in measuring the diameter of Venus and Mercury was proved to be a function of the magnifying power used. Almost all the spectroscopic measurements were made by photographic means. A number of good negatives in connexion with the spectra of certain well-known stars were obtained, but great difficulties were experienced with the telescope owing to the objective being corrected for the visual rays only. This, however, is now put right, for the Government have purchased a new corrector, 2·09 inch aperture, which alters the minimum focus without materially interfering with the length of the chief focus. We observe the public are admitted once a week—every Thursday evening—and the total number of visitors during the twelve months (this including those who came in the day-time) was 1623.

The Projected Copyright Bill.—Parliament has met again, and, of course, nothing has been done at this early period with reference to the Copyright Bill introduced in the House of Lords last session by Lord Monkswell. This Bill, it is well known, is framed entirely in the interests of painters and publishers, and against those of photographers. We are pleased to learn that the petitions against it that have been supplied to most of the photographic clubs and societies have been very largely signed by them, and there is little doubt that, if the Bill is introduced again this session, they will have some weight. Just now the House has much business of vital importance before it, and will have for some time to come; therefore there is little prospect of domestic legislation receiving much attention at present. But there is little doubt, if time will permit, that the Bill will be brought up again this session and, as it will be introduced in the Lords, it may be little discussed if passed to the Commons. Therefore it will be well that those who have the matter in hand, on behalf of the photographic profession, should keep their eyes open in case any attempt is made to bring the subject forward again.

The Free-portrait Swindle.—One would have thought, after all the exposures in the photographic and the lay press, that the free-portrait swindle had been laid by the heels in this country before now. Such seems not to be the case, however, if one may judge from letters that have recently appeared in some of the daily papers. From these it seems that the affair is still running in France, though the victims are here. Some say, "Serve them right, after the many exposures that have been made." But the British public—or rather a certain portion of it—are easily "gulled" by the promise of getting a "handsome picture," or anything else, for nothing. However, we suspect, after all that has been said in the press, that the game is not now so profitable as it once was, though it doubtless still pays or it would not be continued.

Weather Forecasting and the Meteorological Council.—The report of the Meteorological Council for the year ending March 31, 1899, has just been issued. It will be noted that

the year's report has taken no less than ten months to compile and issue. In the report it is claimed that fifty-five per cent. of the weather forecasts were a complete success, and twenty-eight per cent. partial successes. The proportion of complete successes claimed to have been scored is certainly not great, seeing that during settled weather, say in summer, it is not difficult for any one to forecast what it will be for the next twenty-four hours without the advantage of telegraphic reports from all parts of the kingdom. It would be interesting to know how the terms "probably," "possibly," "perhaps," &c., which so frequently appear in the daily forecasts, count in the complete and the partial successes. Really reliable, or even moderately reliable, forecasts of the weather would be very useful to photographers and agriculturists, but we know that both these bodies have long ceased to place any reliance upon them, preferring to pin their faith to their own judgment of what weather to expect.

WE understand that the Meteorological Council have given notice to the Directors of the Ben Nevis Observatory that their grants must cease at the end of the year 1901, owing to the inadequacy of the funds at its disposal. Ben Nevis Observatory is the highest in the United Kingdom, being nearly four times the height of the next highest. It is 4405 feet above sea level, and the mountain is the highest point in the British Isles. The Meteorological Department costs the country between fifteen and twenty thousand pounds a year, and not a few are of opinion that it does not get good value for its money. Some of us, whose work is largely dependent upon the state of the weather are, naturally, more interested in what we are to have than in what we have had in the past. Seeing the advantages the Department has of its some two or three hundred stations and telegraphic communications, we might well expect more reliable forecasts of the weather, only twenty-four hours in advance, than we get at present.

JOTTINGS.

"I SEE," writes a friend of mine who often sends photographs to the "great" exhibitions, "that you are going to allow the Judges to hang, after all." He is alluding to that most momentous question of last autumn, Shall the R.P.S. Judges take part in the work of selection? Looking back six months, it seems difficult to realise that the excitement over this vitally important matter rose to such a terrible height that at least two persons in the photographic world were very charmingly affected by it. What brave things they said and did in defence of the sacred claims of the Judges to select the photographs that were to be put on the walls for adjudication! Ah, my brothers, we may never look upon such noble doings again! At any rate, for the sake of my risible faculties, I, for one, hope that we shall not. So much laughter as the selecting incident of last autumn caused me makes my jaws ache.

BUT to my friend and his views on the participation of the Judges in the work of selection says he, "I'd have hung them first." Unlike my friend, I would not hang *all* Judges, however objectionable some of them might be. I would have them pass before a selecting committee consisting of disappointed exhibitors, and let them take their chance of the rope's noose. So much for that matter. This year members of the R.P.S. are voting for Judges at the same time as they are choosing members of Council. About the latter election there is no excitement at all. How different to the days of the famous "new blood" agitation of three or four years ago! This year, in the ordinary course of things, and what with retirements and so forth, at least five or six new men will be added to the Council, and thus time, in its slow and peaceful way, has worked a revolution which it was sought only a little while ago to effect by violent means!

As to the choice of Judges for the Pictorial Section of the Exhibition, which is to be opened next autumn at the New Gallery, Regent-street, much interest, I know, is felt by members of the

Society. The ballot papers have to be returned by Monday next. If any readers of these Jottings, who are members of the Society, have not voted, and they are anxious to be in line with the large majority of their fellow-members, who wish to have their annual Exhibition judged by a group of men in whom the exhibitors, the Society, and the photographic public can have confidence, they are welcome to what the sporting writers would term my "wire from the course"—in other words, a "tip" just before the start of the race.

HERE it is, with a paragraph all to itself, as it deserves. For the Judges in the Pictorial Selection, then, vote for

F. P. Cembrano.
Dr. P. H. Emerson.
Colonel J. Gale.
B. W. Leader, R.A.
J. B. B. Wellington.

These men are all friends of the Society, and they can be relied upon to make their awards to the best of their judgment. To readers at a distance who may not know for whom to cast their votes, let me say that the above list is an expression of the views of these members of the Royal Photographic Society in London (many of them exhibitors) best competent to express an opinion on the question of suitable Judges for the Exhibition.

I NOTICE a suggestion that Kodak and similar cameras are fitted with lens apertures too small for the "comparatively dull light of the English climate." But you may have your light so "dull" that an aperture of *f*-4 is of no more practical use than one of *f*-16. To open out the aperture of the lens because the light is "dull"—I am here speaking of hand-camera exposures, of course—is theoretically right, I admit, but in practice it very frequently partakes of the nature of a forlorn hope. In the "dull" light of winter, such as we have mostly been having in London since November, I doubt if a change of aperture from, let us say, *f*-16 to *f*-4 would have meant the difference between success and failure in hand-camera work. Below a certain power of actinism, rapidity of lens and sensitiveness of emulsion do not facilitate matters. "The light isn't good enough for instantaneous work," says the practical man; it is too "dull," in fact, and so he doesn't attempt it, even with an enlarged lens-aperture.

THE powers of the Kodak shutters, lenses, and films are by no means used so much as they might be on favourable days in the English winter. Only on December 31 last, I successfully used my No. 2 Folding Pocket Kodak for a little snap-shottting work. True it was in sunlight; but, unless the sun is shining, the opportunities for snap-shots near London in winter are very few, no matter what aperture is used. I remember, in the November of '96, passing a day at Winchelsea and Rye with that accomplished photographer, Mr. Algernon Brooker. It was fairly bright for the time of year—sunny in fact—and I carried a bull's-eye Kodak. My companion rather doubted if the light were strong enough for some of my "snaps"—the end of November is not ordinarily rich in hand-camera possibilities—but, on development, they proved to be fully exposed. My experience and observation show me that the working rapidity of the Kodak cameras—I refer to their use in England—is very much under-rated by many photographers in the winter sunlight.

A LITTLE reminder to those interested in the subject of photographic copyright. On February 21, Mr. Edwin Bale, R.I., is to read at the Society of Arts a paper on "Artistic Copyright." Mr. Bale is said to be the Art Director of the eminent firm of Cassell & Co., Limited, and he has been credited with having a hand in the drafting of those portions of the House of Lords Bill (to which such vigorous exception was taken in these columns last year) which proposed to interfere so seriously with copyright protection enjoyed by photographers under the excellent Act of 1862. In his paper it is possible that Mr. Bale may touch on photographic copyright; let me, therefore, advise those readers of Jottings who are interested in the

matter to make a note of the date of the meeting (Wednesday, February 21), at the Society of Arts, John-street, Adelphi, at eight. Sir Henry Wood is always glad to see photographers at his meetings, and would, no doubt, send tickets to applicants who are non-members.

A WORD of praise is due for the excellent lantern shows which have recently been given at the beautiful house of the Royal Photographic Society at 66, Russell-square. The displays of transparencies by Mr. Evans, Mr. Speyer, and Mrs. Weed Ward have been signally fine, and the R.P.S. monthly lantern nights should do much towards restoring this kind of meeting to favour in the eyes of London photographers. Credit is chiefly due to Mr. J. J. Vezey, who is in charge of the section, and who, in the old days of the Lantern Society, at 20, Hanover-square, arranged many an enjoyable evening. By the way, a rumour reaches me that Mr. Vezey is likely to be asked to take the Honorary Secretaryship of the Society. COSMOS.

THE CAMERA IN THE CAMP.

WHEN touring, how often one takes delight in wondering what it is like "round the corner?" Again, how frequently, when flying down a treacherous incline, does the cyclist tremble at what the unknown, hidden by a bend in the road, has in store for him?

From these instances one may guess the risky predicament of troops who, either by night or by day, advance through unknown regions, consisting of hilly, broken, or wooded ground, diversified by river, morasses, and rock-boulders.

Such, alas! has been the case on too many occasions during the operations in South Africa. Constantly have the troops not only been obliged to locate the enemy, but have been hurried from one position to another *utterly unprepared* to cope with the physical features which await them. The results of this (should one say culpable?) ignorance are that thousands of our men have been either killed, wounded, or captured.

FORESIGHT AND PHOTOGRAPHY.

And yet in many an instance this might have been, had foresight and photography been employed, of a surety avoided. Of course there are sketching and other reconnaissances, and also balloon observations, and very valuable, in their own way, they are; but, because howitzers are most potent, one does not neglect the Lee-Metford.

Similarly the camera, supplemented by the projection lantern, cannot be superseded by any other manner of imparting personal knowledge of the actual aspect of a country to a large body of men.

At the moment of writing, Buller has for over two months been trying to get from Frere to Ladysmith, and, in the course of his operations, every ounce of help from every one of his men has been of almost priceless worth. For many weary weeks his 30,000 men have—more or less—been killing time while preparations for an advance have been in course. Now either before or immediately after Kruger's ultimatum, it would have been perfectly easy for half-a-dozen or so of photographic experts (and photography is one of the sciences practised by the Royal Engineers) to have thoroughly scoured the district between, say, Dundee and Pietermaritzburg, and with the camera's aid have obtained a complete series of *likenesses* of the face of the country. Let me illustrate the value of such a proceeding. Suppose I wished to send a stranger, who could neither read nor speak English, from, say, Charing Cross to the Angel at Islington. A map would be no doubt useful, but, as we all know, risky. If I wanted to make absolutely sure, I could only do so by means of photographs; by their aid I could point out to him how he should pass along Duncannon-street, leaving St. Martin's Church on his right, then, turning round at Trafalgar-square, proceed between the Portrait Gallery and the Garrick Theatre, and so continue along the Charing Cross-road, with various landmarks to guide him, such as the new Hippodrome, and the Palace Theatre, until Oxford-circus and the Horse Shoe were reached.

Similarly, every inch of the way might be made so familiar that, when the lesson had been properly learnt—not of necessity the first time of asking—the pupil would be able, unhesitatingly, to walk straight to his destination, and would, moreover, know before turning a corner whether it was a 'pub' or a church which was the main feature he was coming to.

INFORMATION BOUGHT WITH LIVES.

In like manner a large proportion of our troops could have been taken, step by step, all over the ground to be traversed during an advance on Ladysmith, by either of the alternate routes, so that, instead of dashing forward over rising ground into much-exposed positions, and only finding out their mistake by serious loss of life, the soldiers would, in each

instance, be prepared for the dangers of the position, and would, by one or another expedient, be able to discount the special risk to be met with.

It is, however, needless to labour this point, as the great advantage which accrues to those who know the ground they have to fight over is surely self-evident.

The required series of topographical photographs have first to be taken in complete continuity and displayed in orderly sequence. On this last point the value of the information entirely depends. The procedure to observe may be figured in the mind by the analogous impression conveyed by traversing any route. If, for instance, an average person were to be driven, say, from London to Brighton by the main road, he would subsequently be able, with tolerable certainty, to find his way down by himself. Any how, did he not know every furlong of the road, he would recall all the important aspects at the second time of seeing, would know when he came to the North Downs, recollect Redhill, recognise Leith Hill, the Balcombe "Kopjes," the stretches of fairly level ground, the South Downs, and their folds. All this, or nearly all, could be drummed into him by means of photography. In the case of large bodies of men, the only effective way of making the photograph imprint itself indelibly and vividly on the memory is by means of the optical lantern. This not only because of the intense brilliancy and great size of the pictures shown on the screen (forty feet square is by no means the limit), but because a lantern view may be seen by hundreds, if not thousands, at once. Moreover, the instructor—and, of course, a fully conversant and specially trained one is a *sine-quâ-non*—is able, with much greater effect than if he were referring to a small print, to direct attention, by means of a pointer, to important details which his audience should specially bear in mind.

In such lantern displays of topography it is absolutely necessary, in order that the full benefit may be imparted, that the screen exhibits, side by side with the view shown, a map of the district, so that, as each salient or important feature is displayed, its bearings and distances as regards other parts may be pointed out and impressed on the memory. But, as already indicated, what is of prime importance is that the pictures should be presented in the *exact order* in which an advance or a retirement is to be made. To return to my simile of learning the way from Charing Cross to the Angel. It stands to reason that if one should show the various landmarks in irregular order, or in any order except that in which they occur to any one walking from the one point to the other, no great advantage would follow. Another detail which is far too often lost sight of is that the scenes should be taken from the point of view at or near a given line of advance, and, moreover, should be shown in complete series as seen looking from, say, S. to N., or N. to S., but not mixed, i.e., not one view looking N., and the next S., the third W., and the fourth N.E.

PLAYING THE SPY.

If troops are advancing from S. to N., they will successively come upon the various natural features as seen from S., and without hesitation recognise the landmarks, the other aspects will not so much need to engage their attention. If the photographs have been judiciously taken, and are intelligently explained, there is no reason why any one of the officers and non. coms. should fail to be able, at first sight, to locate all the main strategical points, and further to know what is the lie of the land hidden from sight by hills and woods. Besides this quite invaluable way of educating an army as to its environment and the physical obstacles which have to be overcome or which may be taken advantage of, photography could, and should, take a most important part in playing the spy upon the intrenchments and other preparations of offence, or defence, made by the enemy. How, by the aid of the tele-photo lens, this may be accomplished, is deferred for another article.

In contributing these lines to THE BRITISH JOURNAL OF PHOTOGRAPHY, I do so in the hope that the *cachet* given to my remarks by the mere fact that they appear in the leading photographic technical journal of the world, will lend such weight to my representations that, in the future, military authorities will see to it that a more extensive, systematic, and intelligent use is made of the incomparable advantages in imparting topographical knowledge placed at their disposal by the camera and the lantern.

HECTOR MACLEAN, F.R.P.S.

PHOTOGRAPHY IN WEAVING.

The following description of Herr Jan Szczepanik's latest application of photography for the preparation of the pattern cards for the Jacquard machine for weaving, which was recently given by him before the Vienna Photographic Society, and reported in the current number of the

Photographische Correspondenz, may be of use and interest to our readers.

A material is a combination of two systems of threads which cross one another at right angles. The threads of one system run parallel to one another in the direction of the length of the fabric; they form the warp, and in weaving they must be stretched on the loom in the desired

FIG. 1.

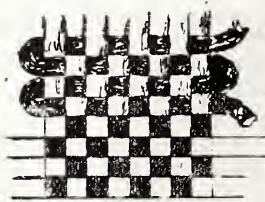
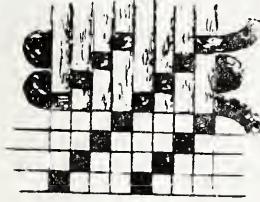
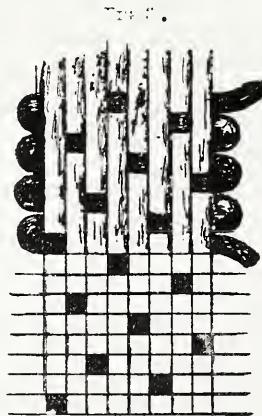


FIG. 2.

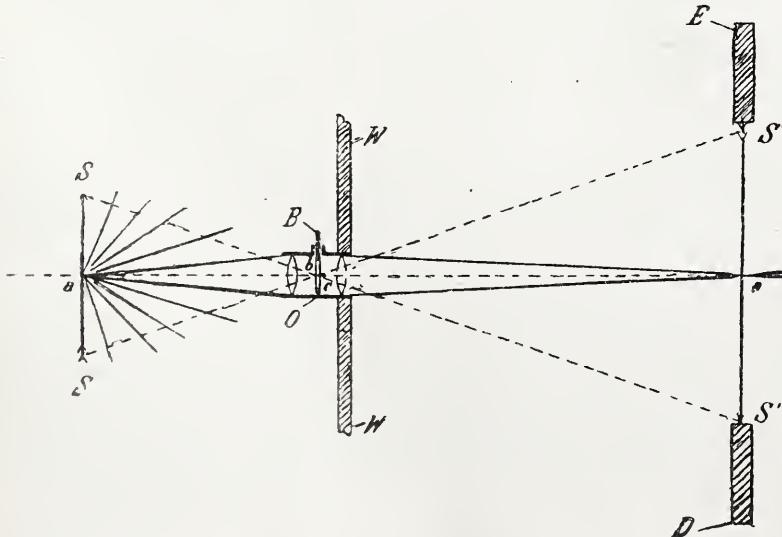


number and of equal length close to one another. The other system of the threads is the woof or weft, which, in the simplest cases, is one thread which runs in the breadth of the material once from left to right, then from right to left without break, between the threads of the warp, and crosses the same according to a desired plan. In order to obtain the crossing, part of the warp threads are raised and part allowed to lie flat,



and through the lease or shed thus formed the weft is thrown by means of the shuttle. The lifting of the warp threads is effected in the Jacquard machine by means of perforated cards. These cards represent the various crossings which are formed in weaving and make the pattern. If we assume the warp to be white and the weft black, there is formed, if the

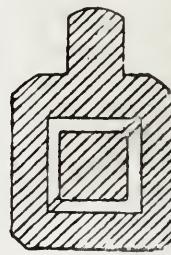
FIG. 4.



crossing takes place regularly, and, for instance, if one thread is lifted and the other lowered, a fabric, the crossing of which, if enlarged, will appear as in fig. 1. This crossing is called taffeta-wove, and in the technical drawings or patterns, which are necessary for the preparation of the perforated, so-called Jacquard cards, this combination will be drawn as shown in the lower part of fig. 1. Figs. 2 and 3 represent

other methods, the so-called four-thread twill and eight-thread satin. In fig. 3 there will be even fewer black points than in fig. 1, and the material will be bright, almost white; fig. 1, on the other hand, appears rather dark. Without the points of intersection there would be, in the ground, and also in the figure, close to one another, long loose threads, and this is obviated in weaving by choosing for the ground and the figure dif-

FIG. 5.

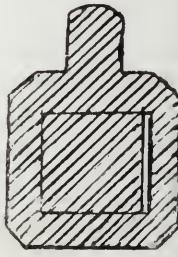
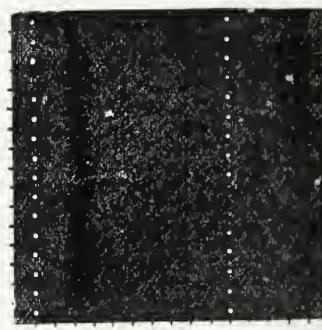


ferent points of intersection corresponding with the pattern. The crossing has the effect, not only the purpose, of fastening by warp or weft loose threads, but also for marking tone effects.

If it is desired to prepare any pattern in material, various crossings must be made visible, thus: for the ground, fig. 3; for the ornament, fig. 1.

Herr Szczepanik has succeeded in producing the pattern cards, which

FIG. 6.



a Schenienplatte.

b Blende heirzu.

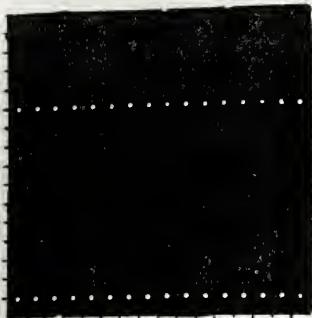
are made one metre square and over, by photography, and to prepare in a few minutes what previously took weeks and months. The whole process has by this means become purely mechanical.

The fundamental principle underlying this process is the action of the diaphragm of a photographic lens through a perforated plate (fig. 4). In this figure *s* represents a negative, *o* is the lens fastened in the wall of the dark room, *s'* the projected enlarged image. Every point of the object to be copied, in this case *a*, sends the rays in all directions, and those which reach the objective form a pyramid of rays, in this case *a b c*. The rays of this pyramid are so refracted by the lens that they combine at the other side of the lens at *a'*. Behind the lens there is, therefore, the pyramid, *a' b' c'*. Both pyramids have different heights, but the same base, *b c*, which is dependent on the shape of the diaphragm between the lens. If the bundle of rays is now intersected with a ground glass or a light-sensitive paper in the plane, *M*, there is formed there a base of the pyramid, which is equal to the base, *b c*, common to the two pyramids, *a b c* and *a' b' c'*, and therefore equal to the diaphragm.

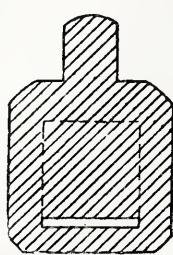
With this new system an enlarging apparatus is combined with a line plate. If a square diaphragm be placed in the objective of the enlarging apparatus, and the lantern be lit, the image of this square is formed behind each aperture on the ground glass, and, by pushing this to and fro behind the perforated plate, these squares may be made to close up to one another, so that the whole surface of the ground glass or the paper appears in squares or check-patterned. If it is desired to produce a stronger lining, a covering plate is placed in front of the perforated plate

that it covers completely a number of the squares, which shall be distributed according to the paper which is to serve as a pattern. It is only necessary to place in the lens a diaphragm like fig. 6 or 7, but with a

FIG. 7.



a Schenienplatte.



b Blende hierzu.

rather broader slit than in the squaring stop used in the first place.

Up to now the lens has been focussed on a ground-glass screen, s's'. If in front of the ground glass is placed the negative of the model which

FIG. 8.

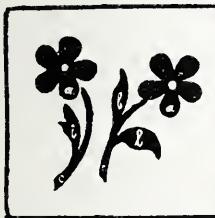


FIG. 9.



is to serve as a pattern, and projects this negative, enlarged, on to the perforated plate, the rays of light which pass through the transparent parts of the negative will also go through the perforated plate, and

FIG. 10.



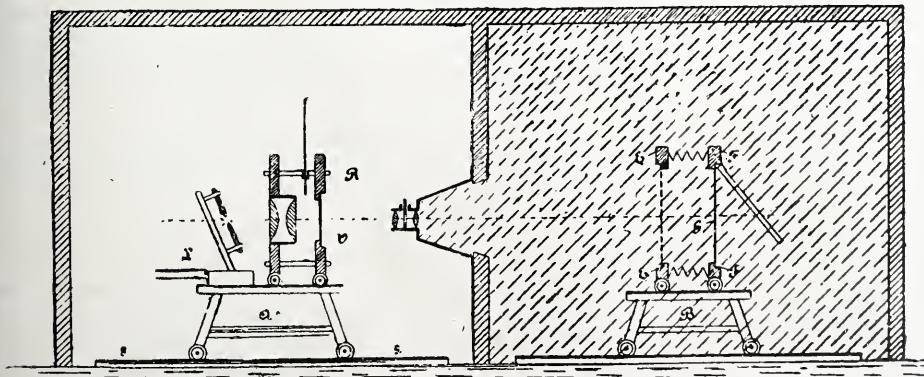
FIG. 11.



simultaneously give the image of the diaphragm, b (fig. 4), on the matt screen.

For preparing the enlarged pattern from the negative, a paper sensitive

FIG. 12.



to light is placed in the place of the ground glass. The diaphragm which is destined to cause the squaring of the image is placed in the lens and exposed without the negative. There is thus obtained that check paper which is known commercially as "Cartarigatta Papier."

The image of the subject is now projected on to the check, and impressed in the same way by placing the negative in the lantern and using the corresponding square stop in the exposure of the negative. If in the ground, or in different parts of the figure, various points of intersection are to be made, the process is carried out as follows:—

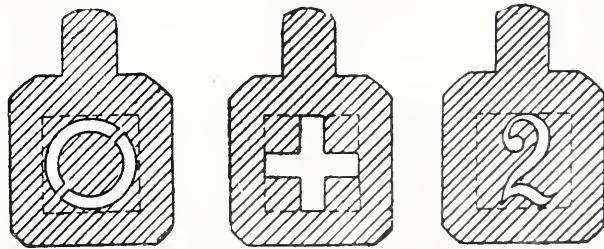
From the subject one transparency (fig. 8) and up to four negatives 6 x 9 cm. are prepared, then there are as many parts of the negative covered so that on every plate only those places shall be transparent as

FIG. 13.



shall have the same crossing (figs. 9, 10, 11). These plates are projected one after another, by means of a lantern (fig. 12) through the perforated plate, E E, behind which a glass plate, F F, is placed for holding the silver bromide paper. If, for instance, the negative (fig. 11) is sharply projected on to the perforated plate with a square stop, there appears, on the gelatino-bromide paper or the ground glass the whole figure in squares. If an aperture of the perforated plate is illuminated, it gives the whole shape of the diaphragm; thus the whole square, by this means the graduated outlines, is explained.

FIG. 14.



The crossings are so effected that certain points on the perforated plate are covered by the so-called crossing plate (fig. 13). To make the patterns about thirty such plates are required. Different negatives or positives with different crossing plates can be used one after another, and thus prepare a pattern with various crossings. The squares in the ground are produced by the transparency and the diaphragm (fig. 5).

Obviously, if in the figures certain crossings must appear, instead of the negative, must congruent transparencies produced from the same be inserted, and for this purpose special stencil frames are used, by means of which the transparency can be placed in the exact position of the negative.

If, in different figures of one and the same pattern, various crossings should appear in colours, so must, on the negative or transparency, those surfaces be covered in which these crossings are not to appear. If, therefore, various colours are to be apparent on the same pattern, so must analogously these places be transparent in the negative or positive according to the ground or figure which must carry these colours. Certain diaphragms can be chosen for certain figures, which can be done by means of such diaphragms as fig. 14 (a b c).

For shaded ornaments a plate (fig. 15) is used which consists of various-sized openings, which form the crossings, is called a shading plate. As every opening is a pinhole camera, the larger diaphragm openings will always print in a shorter. If such a plate is exposed for a

very short time, only the very large points can be impressed, and we obtain fig. 16; with longer exposure, we get fig. 17; with an exposure of one minute, all apertures will be impressed (fig. 18). If, instead of

FIG. 15.

FIG. 16.

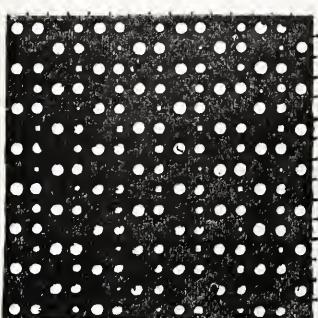


FIG. 17.

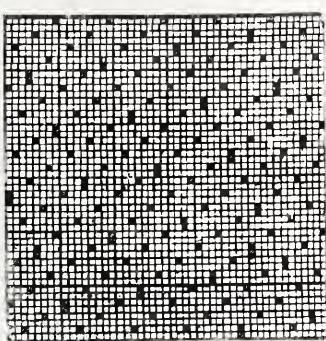
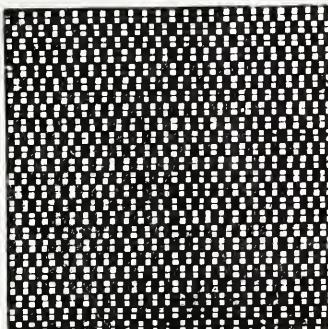
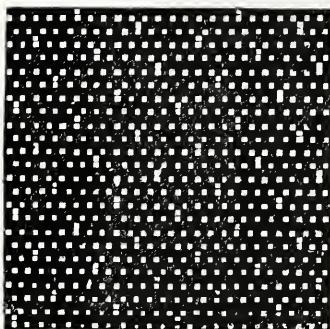


FIG. 18.



different exposures, a negative is placed in front of the lens, and this exposed through a perforated plate on gelatino-bromide paper for a certain time, the brighter portions print more squares than the less

FIG. 19.



transparent. A portrait appears as in fig. 19. The various-sized points of the perforated plate are placed according to certain rules, which correspond to those of weaving. This work far exceeds hand work as regards plasticity, as the preparation of lights and shades by crossing is extremely difficult.

The first experiment, according to this process, was the preparation of a pattern for a silk tapestry, 148 x 120 cm. The patterns used were 176 cm. square, and prepared in six hours, and a pattern-cutter, who could scarcely obtain the same effect by hand work, requires several years.

It should be mentioned that the inventor is now busy in the preparation of fabrics in natural colours on the basis of trichromatic printing. The principle is as follows: Three negatives are prepared from the picture to be woven, similar to those for trichromatic printing, but without the cross-lined screen, and these were so used, with particular shading and covering plates, that for each negative another line was printed. Such a pattern card represented the colour intensities in points of intersection, in which every first line represented the red, every second the yellow, and every third the blue. This naturally recalls the well-known Joly process. If there is in the fabric, that is to say, as warp close to one another in the same order, a red, a yellow, and a blue thread, and these patterns are woven through, there is formed a picture in natural colours. The delicacy of the reproduction depends upon the fineness and thickness of the threads.

Szczepanik's experiments in this direction, with 180 threads to the square centimetre, gave beautiful results, but the colours were somewhat too bright. In weaving in natural colours one does not meet with any of the difficulties of trichromatic printing, since all the colour lines must run parallel, and consequently the superposition of the colours or non-coincidence of the same is completely excluded.

HAND-CAMERA WORK.

[Paper read before the Oxford Camera Club.]

THERE were two things which induced me to offer to read a paper on "Hand-camera Work." In the first place, I had been so frequently asked for information and advice on hand cameras that I thought some remarks on the subject might be of interest. In the second place, members of this Club often say of a bad print, "I suppose that is a hand-camera shot," and I have felt a longing to defend this method of photography, and to try and induce members to appreciate it at its true worth.

Unfortunately I am unable, for various reasons, to show slides from some of my best hand-camera negatives, so that members must not go away with the idea that the work they see to-night is the best that can be done by an ordinary photographer with the hand camera. Still, I hope the examples shown will sufficiently illustrate the different things to be considered in such work.

First of all it would, perhaps, be best to enunciate the different points which would go to make an ideal instrument. It should be light, small, and unobtrusive, with all the working parts to some extent hidden, and none of them projecting. It should have a good rapid-rectilinear lens, working at f-6, and covering a plate about half as big again as the one to be used.

The lens should also be of a fair focal length—at least five and a half inches for a quarter-plate, and should have a focussing arrangement, with an accurate scale plate. There should be two finders properly marked, and a rising front, both ways, to the extent of a third of the edge of the plate used, while a circular level should be placed close to each finder.

The shutter should be easily adjustable, from time exposures up to at least one hundredth of a second, and the aperture of the lens should be alterable without opening the camera.

THE CHOICE OF A CAMERA.

It is almost needless to say that a camera with all these attributes is not to be found at the present day, though there are several excellent instruments which boast of a sufficient number of the essential points to do first-class work. The consequence is that the photographer has first to decide for what work he will chiefly require his camera, and then make his selection accordingly. To take the points *seriatim*, it is hardly necessary to say anything about the advantages of the camera being light and small, but the fact that it should be unobtrusive is not so often considered. In a busy town, or, in fact, anywhere where there are many people about, the advantages of working with a camera that looks like a small dark-coloured box are enormous, as can be easily proved by any

one who has used, under these conditions, both a small box-like camera, and also one that has bellows and opens out.

The next point, that as little as possible should project, is fairly obvious, for, in carrying the instrument in the hand, a projecting part is easily damaged.

The superiority of an R.R. lens requires no demonstration, and the fact that it should be workable at $f\cdot6$ is to make hand exposures possible on dull days. That it should cover a plate half as big again as the one used is to facilitate the free employment of the rising front, while the focus, being at least five and a half inches, will give the work a more natural appearance than that done by the four or five-inch lenses usually put in hand cameras.

A focussing arrangement is indispensable for near objects, and it is most easily managed by rack and pinion. Magnifiers are distinctly to be avoided, for they are always left at home, or lost, whenever they are wanted. In fact, the camera should be complete in itself, with nothing loose to carry about.

Levels are most important, and, when used intelligently in conjunction with the finders, will make all the difference between good and bad work. With the plane of the sensitive surface absolutely perpendicular to the ground, architectural distortion is impossible. A rising front is a necessity for architectural work and street scenes, while, if regularly used in landscape, a great improvement will be noticed in the character of the results. It will be noticed that no mention is made of a swing back, but, with a lens of large covering power and a good rising front, it is a useless addition, besides making the camera more bulky and unwieldy.

Both shutters and diaphragms should be easily adjustable from outside, because they both have to be constantly altered, and everythin that tends to speed and efficiency is valuable.

HAND VERSUS STAND CAMERAS.

From what I have said it will be obvious that no hand-camera worker need produce photographs with the buildings all tumbling down; and, considering the present speed of plates, there is no reason why, even on dull days, he should have any more under-exposed plates than if he used a stand camera. For my own part, however, I do not see why any distinction should be made between a hand camera and a stand, and I think the time is not far distant when every camera below half-plate will be a hand camera usable with a stand, if required. As Mr. Welford said the other day, it is ridiculous for people to say in disparagement of a bit of hand-camera work that it might have been just as well done with a stand, for the remark ought to be just the other way about, it being obviously absurd to carry about and set up a tripod when the same result can more easily be obtained by holding the camera in the hand. There is one thing that I am quite ready to grant to the opponents of hand cameras, and that is that it is far better for the absolute beginner to start operations with the full complement of tripod and double dark slides. In the first place he will not expose so many plates before he starts development; and, in the second, if he forgets to draw the dark slide, or set the shutter, or some other important trifle, he will spoil one, or at the most two, plates, instead of a dozen. The most important point of all, however, is that a beginner does not usually get a really good instrument, and some of the cheaper forms of hand cameras are veritable training grounds for all the worst habits that a photographer can fall into. I do not mean to say that good work is impossible with a cheap camera.

As regards working a hand camera, the first consideration is how to hold it, and, as far as I have been above to judge, close to the side under the arm is by far the most convenient place, and only in exceptional cases does it alter the point of view sufficiently to interfere with the success of the picture. It requires some practice to hold the camera steady for even so short an exposure as $\frac{1}{6}$ of a second, but very soon the knack is acquired, and an exposure of $\frac{1}{8}$ is easily managed, while many can hold the camera quite still for a much longer period.

The plates to be used and their speed must, of course, be governed by circumstances, but it is better to carry too fast a plate than one too slow, as it is easier to stop down and increase shutter speed, but not so easy to make a long exposure in a very dull corner.

In photographing street scenes, and incidents at fairs, and suchlike places, where there are many people, the best procedure is to notice the object you wish to take, and estimate the distance from it to the spot where you require to stand. Then focus your camera accordingly, casually walk to the spot, and with your side, or possibly your back, towards the object, look at it only through the finder, and get your picture unobserved. It is often useful to be able to take photographs from the top of a moving train, but in such a case it should be remem-

bered that the shutter speed will have to be over $\frac{1}{6}$ of a second to attain anything like sharp definition.

A new hand camera should never be taken on an expedition or a journey without at least forty or fifty plates being first exposed in it, in order to get thoroughly into its working, and to make sure that it has no fault; also, I am sorry to say, that in many cases some of the parts want proper adjusting. For instance, in many of the cheap cameras, the lens is not quite at the right distance from the plate, while in nearly all, including even some of the most expensive, the finders do not give the exact view which falls on the plate. Again, I only know of about one make in which the rising front works the finders simultaneously with the lens. It is therefore generally necessary to make a few experiments in order to mark the finders in such a way that one can tell exactly how much rising front is required on any particular view. To do this, measure the extent of the rise; say it comes to a third of the length of the plate used, then put a mark on the side of the finder one-third of its height from the bottom.

To work with this arrangement, the view should be properly composed on the finder, regardless of the level, and some point in the foreground noted that just touched the bottom of the finder. Next, without altering the sides of the view, the front of the camera should be depressed till the instrument was quite level, and the rising front should be used according to how high up in the finder was the point in the foreground that had been previously noted. If the point was above the highest line of the rising front, of course another position for the view would have to be chosen or the perspective would be wrong.

As to the best size for a hand camera, anything above a quarter-plate becomes too bulky and heavy for general use, while anything below 3×2 is too small for satisfactory work. The best way for any one to proceed who wishes to get a hand camera is first to decide the price he is prepared to give; second, to make a list of all the hand cameras about that price; thirdly, select from the list those that have a really good and reliable method of carrying the plates or films. After this, the question of what work the photographer chiefly requires to do influences the selection, but for all-round purposes the following points should be considered in the order named: lens, rising front, shutter size, and focussing, while finders and levels can always be altered or added afterwards if no satisfactory in the original.

CLAUD RIPON, M.A.

THE RATHENOWER OPTICAL WORKS.

In reference to the forthcoming centenary of the foundation of the Rathenower Optische Industrie Anstalt, Mr. H. F. Purser, of 33, Hatton-garden, E.C., has kindly supplied us with the following interesting historical details:—

The year 1900, in addition to its distinction as being the last of the old or first of a new century, is of great interest to the optical and photographic world, in that it marks the arrival of the hundredth anniversary of the foundation of the optical industry in Rathenow, and with it the firm of Busch, known as the "Rathenower Optische Industrie Anstalt."

This foundation of an industry and a firm forms a remarkably interesting and unique page in optical history, for it owes its origin to the work of a clergyman, who, having been appointed to the pastorate of the then small agricultural village of Rathenow, and, having some knowledge and interest in optics, later obtained permission to grind lenses, &c., in order to augment his income and that of the parish, that the needs of the poor might be more plentifully supplied.

Thus commenced an industry which has made the town of Rathenow famous, and given employment to thousands of men and women during the past hundred years, and which now supports about 7000 workmen.

The parson mentioned was August Duncker, who worked in the business, and later handed it over to his son, who had received a good education, and who commenced the work of optical construction on strict laws and mathematical rules. During this time the manufacture of spectacle lenses, magnifying and other lenses, had been carried on, a considerable increase being made in the business, so that, when Emil Busch, the nephew of Edward Duncker, came into the business, he found seventy men in employment.

From this time the business developed in a rapid way, and a reputation was built up by the really original creations and discoveries of this man, which earned him the title of councillor of commerce.

He also commenced the manufacture of telescopes, field, and opera glasses, and the firm was soon busily engaged in this department on behalf of the armies and navies of the whole of Europe, Germany, Russia, and Austria being large and continual buyers of the glasses which

experience in many hard campaigns has proved to be of first-class optical and mechanical construction.

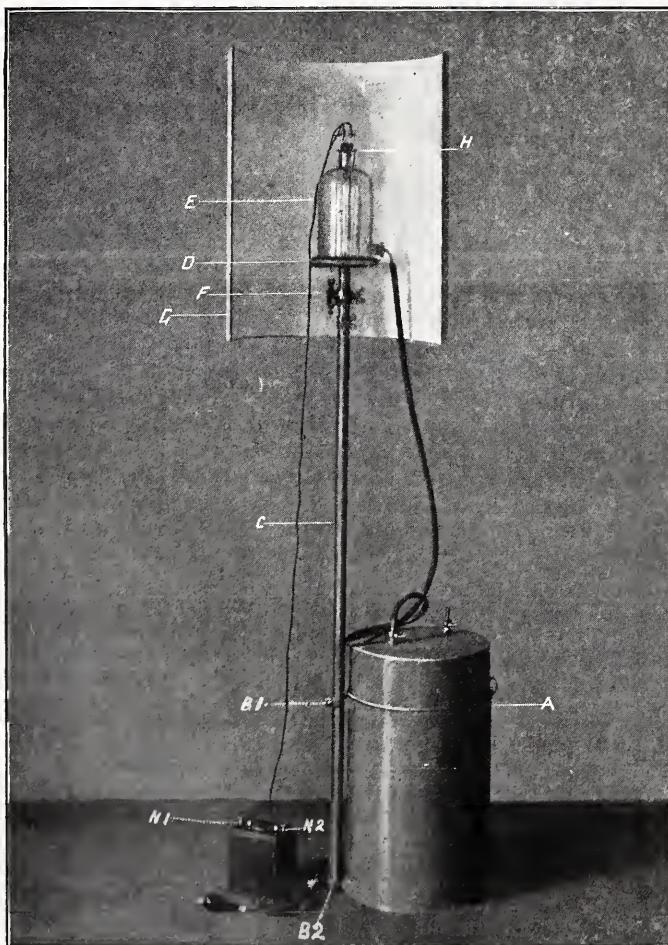
Emil Busch, having no son to succeed him, sold the business to a company now known as the Rathenower Optische Industrie Anstalt. Since the foundation of the industry by this firm, many competitive houses have grown up, but the factory, started in such a remarkable way by a clergyman and carried on later by Emil Busch, still maintains its reputation for first-class optical work, and has added very considerably to that reputation during the past few years by the production of their Aplanat photo lenses and field glasses, &c., which have been made known in this country largely through the agency of Mr. Henry F. Purser.

The centenary festivities are to be held in August of this year, when the whole population of Rathenow and many scattered over the country (for it is a fact that some of the most renowned of modern opticians received their optical education in the factory of Emil Busch) will take part in various events expressing their gratitude to the founder and successors of the optical industry who have done so much to raise the once unknown village to a position of world-wide renown.

Among the items forming the festival programme will be the unveiling of a monument of August Duncker and Emil Busch, and the firm as well as the town have a busy time before them in making the necessary preparation so as to interfere as little as possible with the regular routine of work.

THE PLATINOTYPE COMPANY'S PORTRAIT LAMP.

ON several occasions we have referred to the new oxymagnesium lamp of the Platinotype Company, and its adaptation for portrait purposes in the studio. We have seen many photographs produced by the light which, in softness and naturalness of effect, are not excelled by pictures made in diffused daylight. Appended we give a full description of the system. The first illustration shows the whole of the apparatus, which is exceed-



ingly portable and can be easily stowed away in the corner; the second shows the method of using the light by reflection.

The apparatus consists of an oxygen gas-holder, A, with two sockets, B¹ B², to hold a telescopic rod, C, to the top of which is fixed a wooden table, D. On this is placed the glass vessel, E; below the table, D, is an adjustable socket, F, holding the reflector, G. The glass vessel is connected with the gas-holder by a rubber tube, one end being attached to

the stop-cock on the top of the gas-holder, the other to a bent tube passing through a rubber cork in the opening at the base of the glass vessel.

A rubber stopper is placed in the neck of the glass vessel; through this stopper a metal rod passes with a screw clamp to hold the magnesium ribbon. On opposite sides of this rod are two smaller rods to which are attached two brass caps fixed to the conducting wires, the other ends of these wires being fixed to the battery at points. A switch is provided, by means of which the magnesium is ignited.

For the method of working, the principal directions are as follows:

1. See that the inner vessel of the gas-holder, A, can be raised and lowered freely.
2. Open both stop-cocks to allow the air to escape.
3. Put sufficient water into the tank, A, to just cover the top of the inner vessel.
4. Turn off one stop-cock and to the other attach a tube from a cylinder of oxygen, allowing the oxygen to pass into the vessel, A, until the top of the inner vessel rises about six inches above the rim of the outer vessel. This will take about half a foot of gas.
5. Shut off supply from



the oxygen cylinder, turn off stop-cock and disconnect the tube. After the insertion of the magnesium in the holder (simple directions for which are also given) the apparatus is ready for use. By pressing the button at the end of the push the electric circuit is completed, which causes the fine wire to become hot enough to ignite the fuse at the end of the magnesium, which then burns, giving a light of great actinic power.

The stop-cock being left open allows the oxygen, which expands with the heat, to pass back into the gas-holder, and the amount of oxygen consumed to be automatically replaced. The entire apparatus costs about 8*l.* We have seen it in operation several times, and can testify that it is exceedingly simple and effective to use, and that the results it gives are excellent. For studio portraiture in dull weather the photographer could not make a better investment.

THE GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION'S ANNUAL EXHIBITION.

THIS important fixture, which in the past was generally held during Christmas week, has this year been arranged for a month later, and for several reasons the change has proved to the Association's advantage.

A radical change has been introduced by the Council this season in the matter of judging. In previous years the services of three local gentlemen were requisitioned, but on the present occasion the awards have been decided upon by the voting of members of the Association. This occupied two days, and was completed late on Saturday night last so far

as the framed pictures were concerned, the Lantern-slide Section being decided by the meeting of the Association on Monday night. A very large gathering of members turned out to vote upon the fifteen sets competing, and the large lecture hall of the Society presented a busy scene on the occasion, much fun and merriment taking place as the various sets were projected on the screen.

The Exhibition, in point of quality, is a distinct advance on previous years, and as to numbers is practically the same as last year. Doubtless, the fine season of 1899 has had something to do with the excellence displayed, notwithstanding that several of the best workers are not represented, among whom may be mentioned the names of Mr. Archibald Watson and Mr. J. C. Oliver.

Carbon is the most popular printing process, and platinotype is conspicuous by its almost total absence.

The enlargement class includes some fine examples by Mr. Donald Dove and Mr. Gossman.

In the Landscape Classes Mr. W. J. B. Halley shows to much advantage, and the class for pictures obtained during the Association's outings during the summer proved very attractive.

As in previous years, the Exhibition remains open for fourteen days. The following are the awards:

Class I.—Landscape (including Architecture), sizes above half-plate: Mr. W. J. B. Halley, silver; Mr. James Douglas, bronze.

Class II.—Landscape (including Architecture), half-plate and smaller: Mr. Alexander Allan, silver; Mr. A. J. Kay, bronze.

Class III.—Portraiture (including Groups and Figure Studies), any size: Mr. James Douglas, silver; Mr. Robert McMillan, bronze.

Class IV.—Hand Camera (camera must be held in the hand), any size: Mr. James Douglas, silver; Mr. W. L. Primrose, bronze.

Class V.—Lantern Slides: Mr. W. J. Resch, silver; Mr. W. Bryson, bronze.

Class VI.—Bromide Enlargements (Portraits, Groups, and Figure Studies), not less than 10 x 8: Mr. R. T. Armour, silver; Mr. G. Campbell-Dickson, bronze.

Class VII.—Bromide Enlargements (other than Portraits, Groups, and Figure Studies), not less than 10 x 8: Mr. J. W. Resch, silver; Mr. Donald Dove, bronze.

Class VIII.—Best Picture taken at an Outdoor Meeting of the Association in 1899, any size: Mr. W. J. B. Halley, silver; bronze not decided (a tie).

Class IX.—Landscape or Seascape (open only to Members who have begun photography since January 1, 1899, and who have not won an award anywhere):

Class X.—Landscape or Seascape (open only to Members who have not won an award anywhere): Mr. J. W. Downs, silver; Mr. William Neilson, bronze.

PROPOSED PHOTOGRAPHIC BRANCH OF THE HAMPSTEAD ASTRONOMICAL SOCIETY.

We are asked to state that photographers are invited to attend a meeting to be held at the Hampstead Library, Prince Arthur-road, for the purpose of discussing the desirability of forming a Photographic Section of this Society, on Thursday, February 15, 1900, at 8.30 p.m., when Mr. E. Compson Crump will take the chair.

The objects of such a Section would be: The holding of meetings for the reading of papers, &c.; an annual exhibition; summer excursions, &c.; and, if deemed desirable, the acquisition of a dark room, or rooms, for the use of members.

Membership of the parent Society (the minimum subscription to which is 5s. per annum) would entitle members to the privileges of the proposed Section.

Mr. F. Lubbock Jermyn, of 3, The Wilderness, Holly-hill, Hampstead, a member of the Council, has consented to act as Honorary Secretary of the Photographic Section, should it meet with sufficient support.

Ladies or gentlemen who are unable to attend the meeting, but who may be desirous of becoming members of the Section, are requested to communicate with Mr. Basil W. Martin, Hon. Secretary of the Society, 7, Holly-place, Hampstead.

NOTES FROM THE WEST OF SCOTLAND.

THE statement which has appeared in several of the photographic journals to the effect that the Glasgow *Evening Times* Camera Club was on the eve of being wound up, was, to say the least of it, premature and misleading. This important photographic association, with its very large roll of members, has for a long time felt the desirability of making some change in the constitution, whereby a more befitting name might be adopted than that of hitherto, it being felt that the scope of the Club should have a wider sphere than its name implied, and so for a long time past it was recognised that, were the Club's name changed to the Glasgow Camera Club, it would convey a much better idea of the Society's position, which, in reality, has never been confined to the immediate surroundings of the *Evening Times* newspaper. This step has now been taken, and in future it will be known as the Glasgow Camera Club, and, under its new constitution, we have no doubt it will have a long and prosperous career. The Glasgow and West of Scotland Horticultural Society has arranged

for another photographic exhibition in connexion with its autumn flower show to be held in St. Andrew's Halls in August next. Some change will be made in the classes over those of last year, and money prizes will, this year, give place to medals and photographic apparatus. The Judges will be Mr. Dewar, Curator of the Botanic Gardens; Mr. Wm. Goodwin, Hon. Secretary of the Glasgow and West of Scotland Amateur Photographic Association; and Mr. Archibald Watson.

Several gentlemen, well known in the West of Scotland, are in Africa, and we are now beginning to see the pictures they have secured with their cameras. One interesting series shown for the first time last week embraced a photograph of the action at Maggersfontein, and Messrs. Geo. Mason and Co. are showing this week, in the Corporation Galleries, another fine series of views under the auspices of the exhibition organized by the Artists' War Fund in Glasgow.

Our Editorial Table.

THE "EASY" SERIES OF CLOUD NEGATIVES.

Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

IN sending us a sample cloud negative, Mr. Welford says he makes a feature of having a very large variety to choose from, and of the fact that the cloud is finely gradated into an opaque foreground, thus rendering the necessary shading easier in combining with another negative. The sample sent bears out the claims that are made for it, and the series can be recommended to the attention of those who make negatives yielding white skies in the positives, and who therefore desire a ready means of printing in clouds. These negatives are obtainable from all dealers, the wholesale agents being Messrs. Charles Tyler & England Brothers, Ltd., Copenhagen-street, London, N.

Studio Gossip.

MR. T. C. TURNER, the well-known photographer of Regent's-terrace, Hull, informs us that the studio of Turner & Co., Limited, of Barnsbury-park, London, N., has been closed. The premises have been found too large for modern business requirements. The studio in Upper-street, Islington, will, however, be conducted as usual under the style of T. C. Turner & Co. This concentration of the firm's affairs will give Mr. Turner greater opportunity for attending to his rapidly increasing Hull business.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, February 14. Members' Open Night.

ROYAL PHOTOGRAPHIC SOCIETY.—The Annual General Meeting will be held at 66, Russell-square, at eight p.m., on Tuesday, February 13, when the report of the Council and the Treasurer's accounts will be submitted to the members, and the result of the ballot for the election of officers and Council will be announced.

THE G.E.R. Mechanics Institution (Photographic Section) will hold their Seventh Annual Exhibition on March 13 and 14, at the G.E.R. Mechanics Institution, Stratford, E. There will be an open class for general work. The Judges will be Messrs. Seyton Scott and Basil E. Lawrence. The Exhibition Secretary is Mr. C. W. Harris, 294, Cam Hall-road, Leytonstone, E

THE Exhibition of photographs by Mr. J. Craig Annau, of Glasgow, now hanging upon the walls at the Royal Photographic Society's house, 66, Russell-square, will remain open until the end of February. It is hoped that everybody interested will take the opportunity of examining the collection, which numbers about eighty examples. Admission on presentation of card, between ten and four o'clock.

OUR contemporary, *The King*, which is making a speciality of its war photographs, advertises that it consistently uses war photographs, and not war sketches, because people want truthful snap-shots taken in South Africa, and not fancy drawings worked up in London. It adds: "The King does not tamper with its war photographs. It does not 'fake,' and the titles of the photos are as nearly as possible in the actual words of its correspondents."

A DAILY contemporary states that, during the recess Sir Benjamin Stone, M.P., has secured a number of photographs of the exterior and interior of Windsor Castle, for which the special permission of the Queen had first to be obtained. In all, between 600 and 700 pictures were taken, many of them being of portions of the Castle which had never before been photographed. A copy of each of the photographs taken is to be forwarded to the new department at the British Museum.

CRIPPLEGATE INSTITUTE.—An advanced class in photography, consisting of twelve lessons on bromides and enlargements, carbon printing, combination printing, and lantern slides, will commence on Tuesday, February 13. Lecturer, Mr. John H. Gear, F.R.P.S., Certificated Teacher of Photography, City and Guilds of London Institute, and of the Polytechnic, Regent-street, W. Full particulars can be obtained on application to the Manager, Cripplegate Institute, Golden-lane, E.C.

THE FALLOWFIELD BOHEMIAN CONCERT.—This always pleasant little function, held by the employees of the firm and their friends, takes place on Friday evening next, February 16, at the Champion Hotel, Aldersgate-street, E.C., under the presidency of Mr. F. W. Hindley. A copy of the neatly printed programme has been sent us. It contains between thirty and forty items, and it may therefore be anticipated that a very pleasant evening is in store for those who purpose attending the concert. As usual, Mr. F. J. Goode is Hon. Secretary, and he is assisted by an efficient committee.

BY the death of Mr. Andrew Stewart, Editor of *The People's Friend*, on Thursday, Dundee has lost one of its most enthusiastic amateur photographers. Mr. Stewart occupied the presidential chair of the Dundee and East of Scotland Photographic Association for two seasons, and his annual addresses were models of good sound common sense, garnished with a poetic appreciation of the beauties of nature. Mr. Stewart had toured much in America, Norway, and the Continent, and camera and pen combined to give the readers of the popular miscellany over which he presided many bright and informative articles. On the occasion of his editorial jubilee in 1896, he was presented with his portrait, painted by Mr. Charles Martin Hardie, R.S.A. Mr. Stewart was a self-made man, having started life as a paper-ruler, and by sheer merit gained his present position.

Commercial Intelligence.

MR. W. D. WELFORD, of 19, Southampton-buildings, Chancery-lane, says he will be removing shortly to larger premises. Mr. Ernest Human, late of Taylor's Drug Stores Photo Department, High Holborn, W.C., is Manager to Mr. Welford, who has two new hand cameras and many other novelties coming out shortly.

MESSRS. BERGER & Co., of South Hill Park, N.W., inform us that the extension of their works and machinery is now quite complete, and that, in addition to the new papers they recently placed upon the market, other productions of a very striking nature are well in hand, and will be shortly introduced into the photographic world. Mr. Edwin Banks, the well-known photographic chemist, has joined the firm, and, in conjunction with Mr. Maurice S. Berger, is in charge of the chemical laboratory and emulsion rooms at South Hill Works, Hampstead.

A CONTEMPORARY states that intending exhibitors at the Paris Exposition will do well to protect their inventions by means of foreign patents before sending their devices, for international expositions have always offered a splendid opportunity for unscrupulous imitators of new devices and inventions to pirate them if they are not covered by foreign patents. It is also believed that trade marks will be infringed in the future as in the past. The Parisian Inventors' Academy is also attempting to do an unusually large business, and there are so many pitfalls arranged for the inventor that it would be well before making contracts of any kind to make sure of the standing, financial and otherwise, of the firms which are to attend to exhibits. Our quotation has reference to American exhibits; the hint, however, may apply equally to those firms in this country who propose being represented at the Exposition.

By the courtesy of Mr. John Carbutt, the well-known plate-maker, &c., of Wayne Junction, Philadelphia, we have received a copy of the *Philadelphia Public Ledger* of January 12, which contains a brief account of a meeting recently held in New York for the purpose of organizing the Photographic Manufacturing Association of America. It appears that the meeting was held at Waldorf-Astoria, and was attended by representatives from the Scovill & Adams Co., of New York; John Carbutt, dry plates, films, and paper, Philadelphia; Wills & Clements, of Philadelphia; the Bullard Camera Company, Springfield, Mass.; Manhattan Optical Company, New York; the Cozy Camera Company, Boston; Defender Photo Supply Company, Rochester, N.Y.; Vive Camera Company, Chicago; Gundlack Optical Company, Rochester, N.Y.; New York Dry Plate Company, and the G. Gennert, New York. The organization is a co-operative association for the benefit of its members and retailers, and especial emphasis was placed in the statement, "It is not a trust, but organized to oppose any coalition having for its object the concentration to one source of the supply of photographic goods, and for the dealer to assert his right to buy such articles as he may choose from any source whatever." Mr. W. I. Lincoln Adams was elected President, Mr. M. B. Hoyt, Secretary, and Mr. F. H. Hoge, Treasurer. The new association will be immediately incorporated under the laws of New York State, and every action taken to get the support of retailers throughout the country.

Re FREDERICK GEORGE FRY, recently in partnership with T. E. Parkin, and trading as Parkin & Fry, dealers in photographic materials, the Etna Mills, Old Swan, Liverpool. The adjourned public examination of the above-named debtor was held at the Liverpool Bankruptcy Court on Thursday, February 1, before Mr. Registrar Bellringer. It appeared that in January of last year Fry advertised for persons to join a syndicate to bring out a secret process which he had discovered for making bromide paper. In the result, Mr. T. E. Parkin, of Doncaster, agreed to join the bankrupt in partnership, and to provide the necessary capital. Articles of partnership were entered into accordingly, and the production of the article was commenced. On being practically tested it turned out a failure, and in August last Parkin determined to give notice of dissolution of the partnership; but, before this could take effect, creditors obtained a receiving order against the partners. In the subsequent bankruptcy proceedings, Parkin alleged as the cause of his failure his unfortunate partnership with Fry; whilst Fry's reason was that Parkin had only put into the business 700*l.* instead of 3000*l.*, and, further, the taking possession by a building society of the mills at Old Swan, on which they had expended 1600*l.* Parkin's story was that he found 1117*l.* in cash for the business and 230*l.* for law costs, and his reason for not finding more was that the bromide paper manufactured under Fry's process was found to be worth-

less, and he had utterly lost faith in it. Parkin's public examination was closed several weeks ago. Fry's reply was that his process was a valuable one, and would have proved so if his partner had provided the capital agreed upon. A sealed envelope was produced, and said to contain particulars of the process, but the Registrar declined to go into the question of the merits, and the envelope was taken possession of by Mr. Terry, the trustee in bankruptcy. In the course of his examination, Fry stated that some years back he was appointed liquidator of the Liverpool Musical Supply Company, Limited, of 89, Islington, Liverpool, and that he had handed over 200*l.* to J. H. Yates, a Liverpool solicitor, who was nothing in the matter, and was now serving a term of imprisonment for fraud, and that that 200*l.* had not been accounted for by Yates. Later on, Fry denied that he had ever acted as liquidator, and that the real liquidator was one Charles Rhymes, of whom he knew nothing. Mr. Welby (for the bankrupt) now produced the Registrar of Joint Stock Companies' certificate to the effect that Rhymes was the liquidator. The Official Receiver said he did not yet believe that Rhymes was the liquidator of this particular company, there having been two companies with the same name, the one having taken over the other, which was voluntarily wound up. It had also transpired that Rhymes was discharged, and that a W. G. Duff, a clerk to J. H. Yates, was appointed in his stead. The bankrupt said that, as far as he was concerned, Duff had nothing to do with the matter. He denied that he, as chairman of the meetings and managing director, and Yates, as solicitor, had the whole thing between them, and added, "And don't you dare to say such a thing." He denied that he got the money. The Registrar remarked that that was certainly what the debtor had said. The bankrupt, continuing, said he could prove that Rhymes had received the money. The books of the Company had all gone to Yates's office, and he knew nothing more of them. The Official Receiver said he did not think the matter could be carried further on the public examination. The Registrar: Then I shall close the examination; but I do so, expressing my opinion that a more unsatisfactory examination has never been before me.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
12.....	Bradford Photo. Society	{ Demonstration: Enlarged Negatives. Percy Sheard.
12.....	Camera Club	{ Mountaineering in Switzerland and Scotland. Professor Norman Collie, D.Sc., F.R.S., &c.
12.....	Kingston-on-Thames	{ Demonstration: Platinotype Printing. The Platinotype Company.
12.....	Whitby	{ Lecture: Technical Control for Pictorial Results.
13.....	Birmingham Photo. Society ...	Members' Lantern Evening.
13.....	Hackney	Chamonix and Mount Blanc. J. Gunston.
13.....	Isle of Thanet	Annual Lantern-slide Exhibition.
13.....	Leeds Photo. Society	The Woodlands. Percy Lund.
13.....	Royal Photographic Society	Annual General Meeting.
14.....	Ashton-under-Lyne	Demonstration: Gravura. A. C. Baldwin.
14.....	Croydon Camera Club	{ Annual Meeting.—Exhibition of Architectural Photography by Messrs. Bulbeck & Co.
14.....	Photographic Club	Members' Open Night.
14.....	Southport	{ The Carbon Process in Practice. The Autotype Company.
14.....	Southsea	Annual Dinner and Smoking Concert.
14.....	Tunbridge Wells	Radiography. Geo. W. Howard, F.C.S.
15....	Camera Club	{ Some Aspects of Ancient Egyptian Art. W. Basil Warsfold, M.A.—Exhibition of Pictures by A. Birchett.
15.....	Leigh	Demonstration: Gravura. A. C. Baldwin.
15.....	Liverpool Amateur	Demonstration: Enlarged Negatives. Dr. Llewellyn Morgan.
15.....	London and Provincial	Annual Supper.
15.....	Oldham	Making a Stereoscopic Transparency. W. Schofield.
16.....	Bootle	Demonstration: Gravura. A. C. Baldwin.
16.....	Borough Polytechnic	Practical Evening: Tones on Platinotype Paper.
16, 17	Croydon Microscopical	How a Lens is Made. C. P. Goerz.
16, 17	West London	Annual Exhibition.
17.....	Glasgow and West of Scotland	Close of Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 6.—Lantern Meeting,—Mr. J. J. Vezey in the chair.

SHAKESPEARE AT HOME.

Mrs. CATHERINE WEED WARD gave, to an overflowing and deeply interested audience, her charming lecture on "Shakespeare at Home," which was illustrated by a large number of lantern slides from negatives made primarily in connexion with the book which Mr. and Mrs. Ward issued some two years ago, on the subject of the Shakespeare country. Shakespeare, she said, was essentially the product of his times, and she therefore began by briefly sketching the condition of England, socially, politically, and religiously, in the sixteenth century. Then the life of the poet at Stratford-on-Avon was described and pictorially illustrated from his birth; views were shown of Snitterfield, Arden, Bidford, Charlecote, Clopton, Luddington, Tiddington, and all the scenes associated with his childhood, boyhood, school days, courtship, and marriage, with photographs of the Memorial Theatre and museum, and a number of portraits and busts, the whole subject being dealt with in a most enthusiastic and painstaking manner, which was thoroughly appreciated and enjoyed by all present. Mrs. Ward concluded with a few words of advice to those who think of visiting the Shakespeare country, to the

following effect: When you go to Stratford, make your headquarters in the town itself. Go there in nightingale time, if you can; but, whenever you go, try to get behind the great facts, and buildings, and objects of interest to the real life, and poetry, and sentiment of the place. The singing birds, the rippling river, and the whispering trees are much the same to-day as they were 300 years ago. If you realise the position of the son of the bailiff in the day when books were few, and if you can but partially understand the character of such a genius as Shakespeare—receptive, observant, with great memory, and a great, living, human sympathy—you will need no anti-Baconian argument to convince you that whoever wrote Shakespeare's plays was a poet by birth rather than a scholar by books.

A very hearty vote of thanks having been given to Mrs. Ward,

The Rev. F. C. LAMBERT mentioned an interesting and little-known fact connecting Shakespeare with London, that two of Shakespeare's companions, Jack Heminge and Harry Condell, are interred in the church of St. Mary Aldermanbury, near Moorgate-street. He also said that there was in that churchyard the only statue of Shakespeare to be found in London, with the exception of the one in Poets' Corner in Westminster Abbey. It will be remembered that Heminge and Condell edited the first folio of the Plays, published in 1623, and that to them and Burbage—all of whom were associated with him at the Blackfriars Theatre—legacies were bequeathed by the will which "the poet for all time" made a few weeks before his death. We may add that, on the north side of the altar of the church referred to, there lie the remains of Judge Jeffreys, of notorious memory.

COMING EVENTS.

February 13, Annual General Meeting. February 20, Photo-mechanical Meeting, subject to be announced. February 27, Technical Meeting, "Electricity in Connexion with Photographic Action," by Mr. W. Friese-Greene. March 6, Lantern Meeting, "Some Beauty Spots of English Scenery," by Mr. J. A. Hodges.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 1.—Mr. A. Mackie in the chair.

Mr. GRANT, of the Sandell Films and Plates, Ltd., gave a demonstration of the new Cristoid film. The Cristoid film consists of the double emulsion film of the Perfect plate, coated more thickly to make it independent of any base, such as paper or celluloid. The emulsion is double-coated on plate glass and afterwards stripped, and, consisting altogether of emulsion, the operations of development, fixing, and washing take place on both sides at once, thus quickening these processes. Lightness is a strong point in favour of the films, as also is flatness during the operations. The two coatings of which the film is formed are of different speeds. The glossy side of the film, which is that which was first coated, is a slow emulsion, the matt side being a fast emulsion. The latitude in exposure allowed is tremendous. This was shown by developing films which had been exposed for 1, 15, 60, and 300 seconds respectively under like conditions of light, &c. In the Cristoid film one has a material capable of receiving far more light work than is necessary to make a perfect negative. The film receives a certain amount of light—it may be a correct or incorrect exposure—and a certain action takes place. The essential point is that a developer of one strength, the function of which is purely mechanical, be used. With this the film is developed until the whole of the light action is utilised. When fixed, the negative will show the nature of the exposure; if correct, the negative will be correct. If over-exposed, there will be a corresponding excess of density, which, if too great for printing purposes, can be readily reduced by ferricyanide of potassium and hypo. The two films of emulsion are on the matt side, of a speed of 100 H. & D., and on the glossy side 10 H. & D. Either side may be used; the rapid for instantaneous exposures, or the slow where greater contrast is wished for. Halation is impossible, and frilling cannot occur. The stumbling-block of all photographers is exposure, but with this film, if one only gives enough, one can go on to 300 times, and yet get a useful and printable negative. It has been found that for X-ray work the film is specially useful, notably in cases where a plate cannot be employed when the film is twined round a body, &c. For carbon printing the negatives are also very convenient, dispensing with double transfer or a reversed image, as the negative can be printed from either side. There is another quality peculiar to the films, and that is that they enlarge during development and subsequent operations twenty-five per cent. in area. This expansion is regular and constant, depending upon the initial thickness of the film. Once enlarged, it can be dried at the enlarged size by squeegeeing upon glass or ferrotype plate. Should it be desired to restore the film to its original size, however, it can easily be done by using a bath of methylated spirit after washing, and then squeegeeing. The standard thickness of film now adopted is one two hundred and fiftieth of an inch, and it is found that this expands exactly twenty-five per cent. Whatever the exposure, one should always develop for the same length of time, six minutes, with the solution at from 55° to 60° F. Before development the exposed film is soaked in a bath of—

Formalin	2 ounces.
Potassium bromide	60 grains.
Water.....	to 1 pint.

The bromide tends to retard the otherwise accelerating influence of the formalin. After a few minutes in this, the films are transferred to a developer, of which the stock solution is composed thus:

Pyrocatechin	1 ounce.
Potassium bromide	30 grains.
Sodium sulphite	4 ounces.
Sodium hydrate	½ ounce.
Water (boiled or distilled)	1 pint.

For the standard developer, one part of the above is diluted with seven parts of water. If developing with developers other than pyrocatechin, it is advisable to wash the film well after the formalin bath; otherwise, with some reducing agents, a sherry-coloured film will result. Pyrocatechin is considered best, however, as a developer. Of course, nothing can equal a correctly

exposed negative; but, with this enormous latitude of exposure, and acting according to instructions, an excellent negative, though much over-exposed, can be obtained. Mr. Grant then went through the operations of developing films with exposures ranging from one to 300 seconds, finally comparing those which, through over-exposure, were so dense that they had to be reduced, with the correctly exposed film (one second).

A vote of thanks was passed to Mr. Grant for his demonstration.

Mr. BROWN remarked that, at the last meeting, he had commented upon the fact, that in the old days a piece of white paper placed behind a plate gave an apparent increase of exposure. He had exposed a plate partially backed with caramel and partially with white paper, and found that where the caramel was present undoubtedly the exposure was diminished; where the white paper had been placed, the difference in density was plainly discernible.

Mr. P. EVERITT said that it had been stated that a backing of white paper added ten per cent. to the exposure. He suggested that two exposures should be made on subjects requiring respectively exposures of nine and ten seconds, giving the nine seconds exposure on a plate backed with white, and the ten seconds exposure in the ordinary way. It was suggested, however, that a difference of ten per cent. in exposure was really inappreciable under ordinary conditions.

Mr. E. HUMAN showed a very compact hand camera for use with Cristoid films, so made that either the slow or rapid side of the film could be used. It takes thirty-six films in sheaths, which are changed by means of a changing bag. The storage chamber is separated from the exposing chamber by a partition, and there is little to go wrong. Of course other films can be employed, but, as a means of exposing films having a front and back sensitive surface, it is worthy of notice.

North Middlesex Photographic Society.—January 29.—Mr. CHILD-BAYLEY (the President) demonstrated the method of obtaining warm tones on bromide paper by means of copper toning:—Ten per cent. solution potash citrate, 2 ounces; sulphate of copper, 140 minims; and ferricyanide of potass, 120 minims; both ten per cent. solutions. This formula toned quickly to a pleasing brown tone of various shades, according to the length of immersion. If carried too far, the tone was unpleasant. Mr. PUPPY showed comparative results obtained by the action of various reducers. Permanganate of potash and sulphuric acid appeared to come between Howard Farmer's and persulphate of ammonia in its action on gradation. He also tried the addition of various chemicals to the solution of persulphate. Sulphocyanide of potass seemed to cut out the lower tones very markedly.

FORTHCOMING EXHIBITIONS.

1900.

February 10-24	Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.
,, 24-March 3	Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley.
March 3-10	South London Photographic Society. Hon. Secretary, Frank Goddard, Woodlands, Van- brugh Hill, Blackheath, S.E.
,, 13, 14	G.E.R. Mechanics Institution (Photographic Sec- tion). C. W. Harris, 294, Cam Hall-road, Leytonstone, E.
,, 26	Twentieth Century International, Birmingham. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.
,, 26-31	Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin.
April 3-7	Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between January 22 and January 27, 1900:—

CINEMATOGRAPHS.—No. 1319. "Improvements in Consecutive View Apparatus." Complete specification. W. K.-L. DICKSON.
CINEMATOGRAPHS.—No. 1320. "Improvements in Consecutive View Apparatus." Complete specification. W. K.-L. DICKSON.
DEVELOPING PLATES.—No. 1351. "Adjustable Frame for Developing Photographic Plates." L. VANINO.
PRINTING AND DEVELOPING.—No. 1530. "Apparatus for Photo Printing and Developing." J. W. VICKERS and J. H. W. RUMSEY.
CINEMATOGRAPHS.—No. 1627. "Improvements in the Method of and Apparatus for Photographing and Displaying Animated Pictures." P. A. THOMAS.
CINEMATOGRAPHS.—No. 1643. "Improvements in Apparatus for Photographing and Exhibiting Cinematograph and Mutoscope Pictures." H. W. H. PALMER.
HAND CAMERAS.—No. 1672. "Improvements in Hand and other Magazine Photographic Cameras." F. H. ALSTON and the BIRMINGHAM PHOTOGRAPHIC COMPANY, LTD.
CINEMATOGRAPHS.—No. 1467. "Improvements in and relating to Cinematographs." HAYDON & URRY, LTD.

Correspondence.

** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

** We do not undertake responsibility for the opinions expressed by our correspondents.

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Your correspondent, Theodore-Brown, in the JOURNAL of January 26, refers to an apparatus, the stereophoto-duplicon, for taking stereoscopic pictures direct with a single lens. Judging from the query put to you by Colonel Gubbins in the previous week's JOURNAL, and the reference by Mr. Brown, the stereographs by this method are produced in one operation by an arrangement of mirrors, and, both views being in their correct position, the negative may be printed from direct, no transposition, as you imply, being necessary before mounting. The method, if effectual, is certainly ingenious, and I should much like to see one of the stereographs produced by this means.

It will be within your recollection that I gave a description, with drawing, of an improvement on the original method devised by the late Latimer Clarke for taking stereoscopic pictures with a single camera and lens. It was described in the JOURNAL for September 1, 1899, pp. 70-71. The only drawback to this arrangement is that instantaneous pictures cannot be taken by it. In other respects the arrangement is perfect for taking stereographs with a single lens either of distant views or of objects close at hand. No transposition is necessary when mounting the print, and the pictures combine perfectly in the stereoscope.—I am, yours, &c.,

THOS. MITCHELL.

Newport, Mon., January 30, 1900.

ARTICLING PUPILS IN PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Doubtless, from your vantage ground, you have had the opportunity of seeing further than some of us confined to a somewhat limited area, although our experience covers the greater portion of time that photography has been commercially worked. It neither transpires from the question of "Guardian" in your columns of January 19, nor in your reply thereto, what was supposed to be included in the sum named (75*l.* for three years). As far as it appears, it may have included residence with the photographer or not. Be that as it may, it seems a sweeping assertion to make, "there is not much to learn in photography now that everything is supplied ready for use, and the remuneration small." First, it implies that the tools, and not the man behind them, do the work; and, secondly, that the remuneration paid by some is set as a gauge for all, and thus "Guardian" may be deterred from putting his son anywhere to learn thoroughly what it is said he has taste for.

I respectfully submit this is unfair to all. Your article of January 26 says: "We regret to say that they (*i.e.* salaries of operators) are generally very low nowadays, for the reason that there is at the present time so very little to learn, and as a consequence the labour market, as the unskilled labour market always was, is overstocked." On the one hand, you speak of what is now as what always was. I venture to say that what the market is—"overstocked with unskilled labour"—is the result of lack of training, and the supposition that, if you only get the tools, all will work right. But let such recollect the *naïve* reply given by a great artist on being asked how he mixed his colours, "With my brains." There have been geniuses in most directions, but I question if any guardian would be justified in giving a lad a few hairs from a cat's tail, and telling him to make his own brushes, if he wished to be an artist, because a genius in poor circumstances had done so. I think his course should be to find out the best artist he could who would allow him to work with, and under him, on such terms as the one would accept or the other afford; and this principle I consider holds good still in photography, where there is always something to learn, but in which many flounder about from the want of proper instruction and arrive at no excellence, and so help to swell the crowd of the unskilled, who, if perchance they get a berth, soon lose it again on that account.

It does not seem to me fair to quote the advertisements you have in support of "remuneration." One can see at a glance the style of them, and the charges obtained, probably 2*s. 6d.* per dozen, for, after all, this must depend largely on the prices obtainable and the number of population available.

I should not have troubled you with this reply, but for what appeared to me a libel on the profession, viz., "that there is nothing to learn."

If that be true, how is it that men get paid from, say, 40*s.* to 100*s.* per week? Even taking the lowest figure, it is equal to many skilled mechanics, none of whom, however, would have obtained that if they had not first been apprenticed, in some cases seven years, at a very nominal remuneration. And I have known several cases where young men have gone through this in a country shop, and very soon after have found their way into London shops (where they generally learn one thing), but these have passed them by and become foremen at good wages. One

thing more, you say, "It is seldom a photographer in good practice cares, even with the inducement of a premium, to prepare a possible rival." I should take it for granted that it would be exceedingly bad taste for a pupil to start in opposition in the same place to his tutor and, if such were probable, there are means to prevent it. I think one who is fond of his profession would feel some pleasure in instructing others if some arrangement be made that both are satisfied with. No one has a right to expect that any man would take the responsibility of instructing others without any remuneration whatever, as tyros will always spoil as much as they do, at least for some time, except in cases that are exceptional, and these would amount to an act of charity and cannot be reckoned on business lines at all. The remuneration any one will secure, either as journeymen, if I may use the term here, or in their own business, must largely depend on themselves, but I contend that the properly trained has the advantage at the start.—I am, yours, &c.,

PROFESSIONAL.

WHAT ONE WANTS TO KNOW.

To the Editors.

GENTLEMEN,—The more one reads the more one wishes to know. Having read the current ALMANAC, I am seized with the desire to learn—

(1) Where Burton's actinometer (mentioned by Mr. Coysh) can be obtained; also, who supplies Warnerke's standard sensitometer screen?

(2) On page 964 I find a note on white silver. Does the immersion in the solution follow, or take the place of, ordinary development? Does the result possess sufficient contrast to permit of its being satisfactorily rephotographed? I have tried mercurial bleaching and rephotographing on an enlarged scale. The result generally lacks contrast, and is inferior to an enlarged negative produced in the usual manner.—I am, yours, &c.,

DABBLER.

[We believe that Burton's actinometer can be obtained of the Autotype Company, 74, New Oxford-street, W. The Warnerke standard sensitometer screen was, we believe, formerly to be had of Messrs. Marion & Co., Soho-square, and perhaps that house may still be able to supply it. We should imagine that the immersion in the solution mentioned referred to takes the place of ordinary development.—EDS.]

THE KEEPING QUALITIES OF EXTRA-RAPID PLATES.

To the Editors.

GENTLEMEN,—Will you kindly give me your opinion on the following question with reference to extra-rapid plates fogging after being kept, which has been usual with me during the three years I have taken up photography as a hobby; also kindly give a remedy, such as a solution to put the plate in previous to developing.

After the packet of extra-rapid plates has been opened (I have tried many makers with the same result) I find they will not keep beyond a month or six weeks, as, although I get fine, clear, crisp negatives when the box is first opened, yet, after the time named, a thin veil of fog comes over the plate during development, although exposed and developed under the same circumstances. I may say I am most particular to keep the plate covered during development; my dark room and camera are light-safe, as other plates developed by the same method are quite clear, although kept much longer. My developers are pyro soda, and since reading Mr. Welford's articles in your JOURNAL ortol, which I think very good.

When I hear of other workers keeping their summer snap shots till winter before developing them, it makes me wonder how it is done.

Hoping you can put some light on this query for me, and thanking you in advance,—I am, yours, &c.,

W. T. DRAY.

27, Landells-road, East Dulwich, January 30, 1900.

[In our opinion, the fact that our correspondent's extra-rapid plates do not keep well for more than such a very short time as six weeks points to some such theory as the presence in his dark room of damp, vitiating gases, or exhalations which attack the sensitive layer. We ourselves have frequently kept extra-rapid plates for periods of over a year, and have produced perfectly clean negatives on development. At p. 1093 of our ALMANAC for 1900 formulæ are given for restoring fogged plates.—EDS.]

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—M. Levy's letter, in your last issue on the subject of metric weights, deals implicitly with a point on which there has been a great deal of misunderstanding and misrepresentation.

It has never been contemplated by the reasonable advocates of metric units that the use of convenient fractions should be forbidden. Possibly there have been a few partisans who have gone this length, but the assertion that these fractions are to be forbidden is generally made by the opponents of the system. That for many purposes the notation 125 for $\frac{1}{8}$ of a superior unit, and that it is in accordance with a notation

which admits of all quantities being accurately expressed, is true beyond all doubt, but it does not deny that the same fraction is also an eighth of the same unit, nor does it forbid the expression of that truth.

But there is another way of looking at the matter, which is commonly neglected. When a customer asks for a couple of ounces of tea, it is not, as a rule, because there is any decided preference for that precise amount, but because it is one convenient to ask for; and it is quite certain that the demand would adjust itself to the new weights and moneys. People would still, perhaps, call the half kilo a pound, and I rather think that this was at one time proposed in Germany, as it was certainly sanctioned by the *Système Usuel* in France, but the wisdom of the German Parliament refused to give such a practice legal sanction. It is quite certain that, if a law as to weights and measures were enforced, language and trade customs would in no long time accommodate themselves to it; but of that desirable solution there seems to be no prospect at present.—I am, yours, &c.,

J. F. T.

To the Editors.

GENTLEMEN,—I have not seen "Free Lance's" letter, but can assure him that there is no difficulty whatever in using metres and grammes.

With regard to the use of the former, I can speak with experience of more than a quarter of a century of the use of metric measures in English bridge and engineering works. I have found that after a very short experience the workmen prefer the metric measures.

As an example of the comparative safety of metres as compared with English measurements, I will give an actual experience. In work abroad, a flange was ordered 2 ft. 7 $\frac{1}{2}$ in.; but the dimension was not clearly written, and the flange was sent out 27 $\frac{1}{2}$ in., or 2 ft. 3 $\frac{1}{2}$ in. diameter. Now, if the dimensions had been given in metric dimensions, such an error could not have occurred. An exactly similar mistake in the diameter of a flange was made at the General Post Office, I believe, but I cannot at the moment lay my hands on the report of it.

So much for measurements; but how about weights, which more nearly concern the photographer? I have opened the ALMANAC at random at page 1034, and read, 70 grains in 20 ounces. Although a fair hand at figures, the above conveys no sense of proportion to my mind, and I can hardly think that "Free Lance" could tell one without.—I am, yours, &c.,

CHAS. LOUIS HETT.

FREAK PHOTOGRAPHY.*To the Editors.*

GENTLEMEN,—I do not know if you will think it worth while to say anything more about freak photography and changing films, but here is my answer to Mr. W. Bloomfield, p. 79 of THE BRITISH JOURNAL OF PHOTOGRAPHY. As I said before, it is not of my own experience I was speaking, but of a friend's, and I have very little experience with Kodaks and the pools of films, but I have seen a spool put in place wrongly, and taken out again and replaced; however, opened. I therefore conclude that, as in the case I mentioned, the spool once inserted, four or five views may have been taken, as was the case in this instance, the whole outfit then taken in a dark room, the spool taken out and rolled back in its original place and gummed up, to put it back when repaired. Then the mistake of the spool (one for the other) made, and in the end the possible experience I mentioned. I do not pretend to say that this would have been possible, or as easy, if the whole spool would have been exposed at first.

As I said before, this is only a personal answer to Mr. Bloomfield, and of very little interest to the public, and I give it to you for what it is worth.—I am, yours, &c.,

A. LEVY.

Asnières (Seine) February 4, 1900.

PYRO STAINS.*To the Editors.*

GENTLEMAN,—Seldom many weeks pass without some reference in your JOURNAL to "pyro stains" upon the fingers. I ask why have these stains, when they can be so easily avoided by simply using glass-bottomed developing dishes? To gauge density, it is only necessary to pour the developer back into the graduate and hold the dish to the light; the negative can be washed without taking it out of the dish. To facilitate its removal, drive into the wood a pin with the head cut off, leaving a portion on the surface of the glass for the negative to rest on.—I am, yours, &c.,

S. J. CASTLE.

Whitstable.

CRISTOID FILMS.*To the Editors.*

GENTLEMEN,—As there seems to be a difficulty with many of your readers as regards the formalin to be used with "Cristoid" films, I should be much obliged if you could mention in your next issue that the formalin intended is the photo formalin of Schering.—I am, yours, &c.,

Norwood Junction, London, S.E.

J. T. SANDELL.

THE SOUTHSEA EXHIBITION.*To the Editors.*

GENTLEMEN,—In the list of awards in the Southsea Exhibition you give my name as F. Fielder, whereas it should be F. Fielding. Will you kindly correct in your next issue and oblige.—I am, yours, &c.,

49 Langham-street, Blackburn.

FRANCIS FIELDING.

"THE ABSENT-MINDED BEGGAR FUND."*To the Editors.*

GENTLEMEN,—I am pleased to say that my offer is being taken up with spirit, but I shall be pleased if you would remind some of the absent-minded beggars at home of the conditions under which this offer was made. I distinctly specified in my offer that they were to send me a stamped and directed envelope, yet many of them do not do so, hence more labour for me.

Many people have expressed a wish that my efforts will be successful in this matter, and several have suggested that the plate-makers should devote a penny from each box of plates sold to go towards the Absent-minded Beggar Fund, in the same way that the Vinolia Soap Company have done, whose fund has now reached 4000 guineas.

All who wish to take part in this fund must send their applications and their shilling by February 24. 133 shillings were received up to February 6.—I am, yours, &c.,

W. TYLAR.

High-street, Aston, Birmingham, February 6, 1900.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

E. Eccles, 15, Broad-street, Bury.—Photograph of the Rev. J. M. Bury.
P. Swift, 260, Waterloo-road, Burslem.—Photograph of His Worship the Mayor of Burslem.
R. A. B. Sharpe, 13, Three Bridges, Ulverston.—Photograph of Professor Ruskin, lying in state.
H. Jancowski, 3, Old Market-place, Grimsby.—Photograph of group of Grimsby volunteers who offered for service in South Africa.

RECEIVED.—SIDNEY RALPH; ACCESSORIES; A. G. M. Dymoke; STUDIO: R. W. B.; ENQUIRER; DARK LIGHT; G. P.; CONSTANT READER; J. H. B. These and others in our next.

K. (Leeds).—We think you may depend upon the assurances of the firm named. It has command of very great practical knowledge.

R. W. B.—As good a book as you could have for the purpose would be *The Half-tone Process*, by J. Verfasser, published by Percy Lund & Co., Bradford.

POSITION OF LENS.—W. GARDNER.—As the lens is a symmetrical one, it does not matter which combination is used as a single lens; but, whichever is employed, the convex surface of it should be next the focussing screen.

NOVICE.—*The Science and Practice of Photography*, by Chapman Jones, published by Messrs. Iliffe, 3, St. Bride-street, E.C., might serve as a useful introduction to the study of photography; but, if your friend is to engage in studio work, one or two works on lighting, posing, and retouching should be obtained for him.

VESSEL FOR ALUM SOLUTION.—ALPHA says: "I am going in for the carbon process. Will you please inform me if one of the zinc developing dishes can be used for the alum solution, or would porcelain be better?"—Zinc vessels are not suitable for alum solutions, as they would quickly destroy the metal. Better use porcelain.

SPOTS.—E. H. & Co. say: "Will you kindly state causes of spots on enclosed photo?"—We are sorry we cannot tell, as no data are given on which we could form an opinion. We may, however, say that they are due to faulty manipulation, probably imperfect fixation. The spots may, however, be due to other causes than that.

CRYSTOLEUM WORK.—CRYSTOLEUM asks: "Could you let me know where I could get some crystoleum work done? I have written to some of the big houses, but could get no information."—In reply: At the moment we cannot recall the name of a trade house undertaking crystoleum: some reader may, however, be able to help.

WAVY MARKINGS ON PLATINOTYPES.—S. ROUSE sends some platinotype prints, saying that, as he has only just taken up the process, he cannot find the cause of the marking on them.—They are evidently due to a scum on the surface of the developer. Probably the dish was not clean when the solution was put into it.

LENS FOR HAND CAMERA.—T. T. J. says: "I have a single lens by A. Ross of six inches focus. Would that do for a hand camera I am making?"—Yes, though it would be slow. If we remember rightly, the largest aperture of these lenses is about f-15. It will, however, be as rapid as any other lens stopped down to that aperture.

ENAMELLED TRAY.—W. W. says: "Our large enamelled tray, which we use for developing platinotype prints in, has the enamelled surface much scratched and cracked. Can you tell us where we can get it re-enamelled?"—We cannot; and, if we could, we should expect that the re-enamelling would cost much more than the purchase of a new dish.

INFORMATION ABOUT PATENT.—T. BEGG says: "In one of your recent issues I saw that a patent had been applied for in connexion with a subject in which I am, just now, much interested. How can I ascertain what the patent contains?"—Only from the inventor. Until the complete specification has been "accepted" at the Patent Office, its contents are secret.

MATERIAL FOR BACKGROUND.—H. HOWE asks: "What is the best material for a background, and where is it to be obtained; it must be seven feet wide and in one piece, without joins?"—The best material is unbleached sheeting, which may be obtained from any upholsterer's or furnishing warehouse. It may be had wider than seven feet if required.

LARGE DIRECT PORTRAITS.—H. H. W. The fault your sitter finds with the portrait is, no doubt, due to its being taken with a lens of too short focus. Although the lens, by being stopped down, has covered the 18×15 plate to the edges, it is only twenty inches focus, consequently the perspective is necessarily very violent, hence the unpleasant appearance complained of.

STUDIO-BUILDING.—W. CLEGG says: "I propose building a small studio at the back of the house, but the light, through trees, will, I fear, be much broken up. Can you tell me of any book that will help me in selecting the form of the studio and its position?"—We should advise you to get the work by Mr. Bolas on the subject. It is published by Marion & Co., Soho-square.

MIXING GELATINE AND ALBUMEN.—N. KNOWLES asks: "Can albumen and gelatine be mixed together? If so, how, and in what proportion without the albumen coagulating?"—Albumen and gelatine may be mixed in any proportions. The only precaution to be taken is that the temperature of the solution of gelatine is kept below the coagulating point of the albumen.

ENAMEL PLAQUES.—E. SCHWARZ asks: "Could you kindly inform me where I could get enamel plaques up to 15×12?"—If copper enamel plaques are meant, we doubt if they are stocked by any one of that size. We imagine that they will have to be made specially to order. Perhaps some reader may know where they are to be obtained, and will kindly give our correspondent the information he desires.

COLOURING P.O.P. PRINTS.—CONSTANT READER says: "I am wanting to colour some P.O.P. prints, but cannot get water colour to adhere to surface of P.O.P. Can you give me recipe for applying to prints previous to colouring?"—Wash them over with very weak oxgall. Prepared oxgall for the purpose is sold by all artists' colourmen. Licking the surface of the print with the tongue also facilitates the flow of the colours.

PHOTOGRAPHERS AND THE 1891 CENSUS.—CENSUS asks us to "give him the number of professional photographers recorded in the census of 1891; and what estimate would we give of the numbers to-day? The figures for 1881 are 7614."—We are sorry we cannot give the figures for 1891, neither can we speculate on what they will be in the next census. Perhaps some reader may give the desired informations for the year 1891.

CHONDROIN.—X. W. asks where he can obtain some chondrin, as he wants it for a special purpose and it must be pure chondrin?—So far as we know chondrin is not really an article of commerce, and we cannot find it quoted in any lists we have referred to. Chondrin is a gelatine obtained from cartilage, and is contained in very many gelatines, and, if our correspondent wants pure chondrin, we expect he will have to make it himself.

ASSISTANTS' REFERENCES.—PRINTER writes: "Is not an employer compelled to give an *employé* a reference after he has left? I was in an employ for six months, and then the governor and I had a row and I left at once. Now he positively refuses to give me a character. Will the County Court compel him to do so?"—No. A master is not compelled to give a discharged servant a character, though one is seldom refused; but it is quite optional.

ANTI-FREEZING MIXTURE.—S. asks: "What would you advise to keep water from freezing round acetylene tanks; I have tried an enormous quantity of glycerine, but of no avail."—The best suggestion we can make is to keep the atmosphere in which the tanks are placed at a moderate temperature. The next best thing we can suggest is to keep them closely surrounded with several thicknesses of close felt; that, with the glycerine, will possibly avoid the freezing.

FAULTY TONES ON P.O.P.—E. J. H. says: "What is the cause of prints (vignettes especially) becoming yellow in the whites before they are carried far enough in toning? I get a nice tone; in fact, all that I could desire, but am troubled with this yellowing, sometimes bleaching, edges of vignettes, and high lights, too. I use the ordinary sulphocyanide and gold only. I should be glad if you could enlighten me on the means to get rid of this yellowness."—There ought to be no yellowing if the manipulations are carefully carried out. Are the vessels in which the prints are washed, prior to toning, and the bath, in good order? If not, that will account for the trouble. See that all the free silver and acid are thoroughly washed out of the prints before they are put into the toning solution.

HIRE OF APPARATUS.—Small Way says: "I am expecting an out-door job to take some 15×12 pictures, and the largest camera and lens I have is for 12×10. Is there any one from whom I could hire a 15×12 camera and lens for a week or so, as it would not, of course, pay me to buy them expressly for this job?"—Messrs. Morley & Cooper, Upper-street, N., and Messrs. Sands & Hunter, Cranbourne-street, W.C., lend apparatus on hire. Apply to either of them.

BLACK VARNISH.—C. K. T. asks: "Can you give me a formula for black varnish for glass positives? I do not find one in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC."—Most of the black varnishes are compounded of bitumen dissolved in benzole or turpentine, sometimes with the addition of a little lampblack. You will probably find it more satisfactory to purchase the varnish than to make it. Bates' black varnish is very good, and at the same time is cheap.

AUTOMATIC PHOTOGRAPHIC MACHINES.—C. W. E. says: "I have heard of, but have not seen, an automatic machine that takes one's photograph and delivers it by putting a penny in the slot, and, for another penny, frames the same. Can you please tell me name and address of manufacturers, or whether I could purchase one, or is the patent in the hands of a company, such as the Automatic Sweetmeat Delivery Company?"—In reply: We are not sure that machines such as described by our correspondent are now commercially available. Can some reader say?

COPYRIGHT.—H. L. G. asks: "Am I allowed to copy the photograph (cabinet size) of the Queen (taken by W. & D. Downey, Ebury-street, London) in an oil painting? I should like to make an oil portrait from it, but do not know if it is allowed, and, as we always take your paper, thought you would be kind enough to give me the necessary information?"—In reply: If our correspondent copies one of Messrs. Downey's photographs, which are assuredly copyright, that eminent firm would probably proceed against him for infringement. He had better write them, and see if permission to copy the photograph is obtainable.

IMPROVING LIGHT OF OIL LAMP.—H. B. Cox writes: "I have a three-wick lamp in my lantern, and I am told that, if I add two or three lumps of camphor to the paraffin oil, I shall get a better light, less smoke, and less smell. Can you tell me if that is correct?"—We have heard the same thing, and also heard it contradicted so far as the light and smoke are concerned, but have not ourselves thoroughly investigated the matter, indeed, we do not use an oil lamp. We should advise our correspondent to add a few small pieces of camphor to the oil the next time he uses the lantern and see for himself. The camphor can do no harm.

VARNISH TO BE APPLIED COLD.—A. BEST asks: "Can you please tell me of a varnish that can be applied to a negative or transparency without its having to be warmed and yet dry quickly like collodion, as I often want to varnish one when a fire is not available? Of course the varnish must dry quite transparent and be colourless."—Yes, a solution of dammar resin in benzole will answer the requirements. From an ounce and a half to two ounces of the resin to the pint of benzole is a good proportion. The benzole should be the best, and the dammar of good quality. The negative must be perfectly dry before the varnish is applied.

LACK OF SHARPNESS IN ENLARGEMENTS.—H. CLEMENT writes: "I have a —'s lantern, with three-wick lamp. The image is excellent on the screen, but, when I use it for making a bromide enlargement, it is not sharp, though it is focussed perfectly sharp on the piece of cardboard which is replaced by the bromide paper. Can you account for this, as every care is taken in the focussing of the image?"—In these circumstances it is clear that the visual and chemical foci of the objective are not coincident. That is the case with many lantern objectives, unless they are specially supplied for enlarging as well as for projection purposes.

STUDIO-BUILDING.—STUDIO says: "I am about to build a studio, a rough plan of which I have enclosed with this (quarter inch to the foot). Will you please let me know if you think it could be improved upon? If so, in what way? I cannot have it any longer, as I have not room. The light is from the north-east."—The design of the studio is very good, and, if it cannot be made larger, cannot be much improved upon. If, however, the glass portion be increased top and side, then both end could be used for the sitter. This, we should surmise, would, at times, be found a convenience; say, three feet six inches each end opaque, and the rest glass.

INJURED WAX-PAPER NEGATIVE.—A. & J. write: "We have had brought to us an old wax-paper negative (12×10) to print from. It has been much crumpled and creased, and it seems useless to print from it as it is. Can you tell us what to do with it?"—Probably, if it is ironed with a tolerably hot iron between blotting paper, the creases will be obliterated. If not, it must be rewaxed. This is done by putting the negative on a hot iron plate and rubbing it over with white wax, the plate being sufficiently hot to melt the wax. Then the negative must be ironed between-blotting paper, different changes, so as to absorb the superfluous wax.

GAS-BAGS.—PHOTOPHIL says: "I should feel greatly obliged if you could mention the maximum weight that can be placed upon a fairly good oxygen English-made bag, without fear of injuring it. I have always difficulty in getting sufficient pressure. Is there no house in England which could supply a hand-pump (duration of labour in working it being of little consideration) for compressing oxygen in cylinder?"—With the usual pressure-boards a good bag will stand a hundredweight. We have frequently seen two hundredweight employed. Any maker of the finer kinds of pump will supply a hand force-pump that will answer the purpose, though perhaps with it you would not be able to get the same pressure as that supplied by the commercial compressors.

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EX CATHEDRA.

PROFESSOR R. W. WOOD's system of colour photography with diffraction gratings formed the subject of a paper at the Society of Arts on Wednesday evening last. We shall probably refer to the matter next week. All the papers and articles that the Professor has hitherto published with regard to his interesting process have duly appeared in our pages, and are summarised at pp. 830-838 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900. Perhaps the simplest description of Professor Wood's process appears in a note we have received from Sir Henry Wood relating to it. "This we quote for the information of those readers who may be unable to realise the underlying theories of the representation of colour by diffraction. White light passing through a plate ruled with fine lines (a diffraction grating) is resolved into its component colours, and a spectrum produced similar to that produced by a prism. By using gratings, the lines of which are at different distances apart, different colour effects are obtained; and, if a plate be ruled with different sized gratings on different parts of its surface, each grating, when viewed from the same standpoint, and with proper optical means, will show a different colour. By a

development of this principle, and by printing from suitable photographic negatives, such as are used in the three-colour process, through gratings of different dimensions, Professor Wood is able to produce a picture which, colourless in itself, shows colour when viewed by transmitted light through a lens fixed in a suitable position."

* * *

THE important subject of the fading of images of stars in gelatine negatives is again touched upon in the *English Mechanic* in the course of a review of Dr. Isaac Roberts's classical *Photographs of Stars, Star Clusters, and Nebulae*, which has just issued from the press. The writer points out that Dr. Roberts has experimentally discovered that, with every conceivable care in the development and fixing of negatives, the images of faint stars fade out of the films after a comparatively few years. In illustration of this he gives two instances: one of a plate on which, soon after it was taken in February 1886, he counted 403 star images on the negative, whereof, in May 1895, only 272 remained; and the second of a negative of the same region taken in March 1886, on which 364 star images appeared, but upon which, on re-examination in May 1895, only 234 were left. "Now, one purpose of capital importance which such photographs are taken to serve is that of presenting an irrefragable facsimile of the region depicted at the given date for comparison with others made at future and distant ones, by which any actual objective changes in the heavens would be instantly rendered apparent. If, however, details disappear after the fashion indicated by Dr. Roberts, it is abundantly evident that the negatives must in future ages become simply valueless." The cause of the disappearance of these faint images is a subject well worth investigation. It involves the proposition that the silver image in gelatine is liable to fade, more or less, a condition of things which we imagine to be apprehended by few photographers.

* * *

IN these pages, for a great many years past, we have often advocated the systematic photographing of disappearing London, and we are glad to have our views endorsed by so eminent an authority as the Chairman of the London County Council, Lord Welby. In the course of a recently published

interview, his Lordship remarked : "A good many of the old familiar features of London are passing away, and new scenes are rising in their places, and I am of opinion that we ought to form a collection of pictures of the vanishing buildings and streets. The area which will be affected by the new street to be made between Holborn and the Strand will, I hope, be photographed to a large extent, and will furnish many interesting pictures. The various committees of the London County Council, in the course of their work, make a good many drawings and take a good many photographs, and I hope the time will come when we shall have the taking of these pictorial records of vanishing London thoroughly systematised, and when, moreover, we shall have a central collection of these pictures under the control of the County Council. There is a good deal of material for such a collection already, but we have not the space. Until we get our new headquarters—which, I am afraid, will not be for some time to come—we have no opportunity for the formation of a central collection. Of course, such a collection would have a great legal value, as well as being of distinct antiquarian and historic interest." The London County Council would, no doubt, welcome the co-operation of the National Photographic Record Association and the survey branches of photographic societies in the matter. It should not be a difficult thing to elaborate a common scheme of working whereby Lord Welby's ideas could be put into operation.

* * *

So far, the photographers at the theatre of hostilities in South Africa have not succeeded in securing negatives of fighting at close quarters, although every other phase of the war, including long-distance firing, appears to have been shown in the illustrated papers. We note, however, at a London place of amusement, The Palace Theatre, a series of animated photographs is being shown which take us very near to the representation of the actualities of carnage by means of photography. These include views of the bridging of the Tugela; mounted Colonials returning from a reconnaissance; the bombardment of Colenso; and the seizure of a kopje near Spion Kop. Hand-to-hand encounters have yet to be photographed, it would seem, although some of the stay-at-home artists have given us, in the illustrated papers, some vivid and striking pictures of such subjects.

* * *

THE Derby Photographic Society sends us a calendar for 1900—the first production of the kind we remember to have received from a photographic society. It consists of a brown-toned card, with a list of the Society's officers and summer and winter meetings. Monthly date leaflets are attached, and the principal embellishment consists of a capital sepia platinum view of Tickhill Castle gateway by Mr. H. Burkinshaw. The card, which bears the honoured name of Richard Keene, Ltd., as the producer, is a most tasteful production, and we congratulate our Derby friends upon it. We note that Sir W. de W. Abney is Patron of the Society, and Mr. C. B. Keene, President.

* * *

WE are pleased to observe that on Wednesday evening last the Manchester Amateur Photographic Society, from whose annual report we elsewhere give some interesting extracts, held a musical and lantern entertainment in aid of the local War Fund, started by the Lord Mayor of Manchester. It is to be

hoped that a hearty response rewarded the Association's efforts. The suggestion that the photographic societies might help the War Fund by holding lantern entertainments has already been made in our columns. Southsea took the lead in the matter, and raised 45*l.*; we trust Manchester will be equally successful. Is it too late for some of the London photographic societies to lend their assistance to such a deserving cause as the relief of those who are suffering on account of the terrible struggle in South Africa?

* * *

THE *London Gazette* recently gave notice that it is proposed to submit to her Majesty in Council the draft of an Order in Council providing that acetylene, when in admixture with atmospheric air or with oxygen, shall be deemed to be an explosive within the meaning of the Explosives Act, 1875, and that it shall not be manufactured, imported, kept, conveyed, or sold. Notice is also given that, in accordance with the provisions of the Rules Publication Act, 1893, copies of the proposed draft Order in Council can be obtained by any public body at the Privy Council Office, Whitehall.

* * *

THE latest departure in stripping film photography that has been brought to our notice, is the invention of Mons. G. Macaire, of the Automatic Printing Company, of Rickmansworth, who has secured patent protection for his process in several countries. The details have not been communicated, but this is an outline of the system adopted: Stout paper, or thin card, is coated with the sensitive emulsion. After exposure, and before development, the film is stripped from the card and passed through the developing solutions. The card has a surface, the nature of which is such that the negative may be squeegeed upon it in order to remove curl, &c. The inventor tells us that he is engaged in coating great lengths of the paper for experimental and other purposes.

EXPERIMENTS IN THE KEEPING QUALITIES OF DRY PLATES.

AUTHENTICATED data on the keeping qualities of sensitive plates and films under predetermined conditions must always interest plate-makers and plate-users. Perhaps no subject in photographic practice lends itself to such a variety of contradictory views and experiences. Only last week we published a letter from a correspondent, complaining that his extra-rapid plates would not yield negatives free from fog after being kept for six weeks. Against such an experience as this it would be a simple matter to set that of many photographers who have not perceived deterioration in very rapid plates at the end of a much longer period. The "unstable equilibrium" of the silver haloid in a highly sensitive film may be, and probably is, liable to disturbance by atmospheric and other causes more readily than the excited salt of a slower plate, but, properly packed and kept, the former kind of plates are by no means so prone to spontaneous decomposition as the thoughtless might suppose. The matter hinges largely on the method of keeping or storing the plates—a very wide subject indeed.

If it does not add much to our stock of positive wisdom on the matter, a summary of some recently published experiments on the keeping qualities of dry plates will at least be interesting and, to some extent, instructive. It appears that the

Technical Committee of the Photographic Society of Philadelphia some time ago received for testing purposes three boxes of plates, purchased and dated in the spring of 1884—that is, sixteen years ago—by one of the members.

It need scarcely be said that the plates were of American manufacture, and they appear, so far as we can form an opinion on the matter from the distinctive names of the brands, to have been of a "rapid" or "instantaneous" kind. Such information, in these days of the photometrical determination of the speeds of plates, may strike the scientific eye as vague and indefinite; but it must be recollected that in 1884 speed-marking was an undiscovered science. In those days—and here we speak from personal experience—a box marked 25 W was meant to convey the *ne-plus-ultra* of sensitiveness. And so it did; in the numerical sense, at any rate.

Calling the three brands of American plates that were experimented with A, B, and C, it appears that A was packed with a soft white string (apparently cotton fibre), wrapped round them in such manner as to separate the opposed film surfaces. When developed, some of the plates showed a faint mark where the string had crossed the film, but this mark was not sufficient to prevent a good print. Exposed on an average landscape, and developed with metol-hydroquinone, all the plates showed a moderate tendency to fog, but, by somewhat restraining the developer, this fogging was easily overcome, and very fair negatives could be produced. Some of the plates showed faint streaks an inch or so in width, but these were not distinct enough to seriously mar the negative. Except for these occasional delicate streaks, the surface of the plates was perfectly uniform.

B were also packed with frames. There was some tendency to general fog, but this could be largely overcome by free use of bromide, and, with a corresponding increase in exposures tolerable negatives could be obtained. Some of the plates were quite free from the heavy band of fog inside the frame, mentioned in connexion with the C plates, while, in other instances, a slight band made its appearance, but never reached any considerable density. Sometimes this band appeared on only one or two sides. The film of all the B plates was very soft and frilled extensively, a defect which was not met with either of the other brands.

Of the C plates the report says that they were packed with cardboard frames between the sensitive surfaces. Every plate showed deep fog except that portion of the film around the edge which had been covered by the separating frame. Here the fog was much less apparent, and, by using a restrained developer, could be almost entirely prevented. This clear edge of a few millimetres was the only portion of the plate upon which a satisfactory image was obtained. Just inside, at a point corresponding to the inner edge of the frame, and for a few millimetres inwardly, appeared regularly a heavy band of fog so dense as to utterly spoil the negative. Inside of this band the fog became less dense, but it was still sufficient to make the plate worthless for any ordinary purpose.

The Committee's conclusions were that none of the plates could be used for quick work requiring an unrestrained developer, but that the A, and perhaps the B, were still available for certain purposes. On account of the resulting fog when a very active developer was used, it was difficult to form an idea as to the speed of the plates, but "our impression is that they have lost little or nothing in rapidity, though this sensitiveness is of no practical use, owing to the impossibility of employing

an energetic developer." The Chairman of the Committee, Dr. C. W. Miller, in a supplementary note, added that the results seemed to suggest several points as to the packing of plates. Cotton seems to exert no prejudicial effect on the sensitive film. Those plates separated by cardboard frames showed no action under the cards, and, if the Manila paper gives no injurious action, the sensitive films can hardly hurt each other; the only reason they are not packed together is that they are apt to rub against each other. The method adopted by some plate-makers, according to Dr. Miller, is to place the two plates film against film, and around the edge of the plates bend two bits of pasteboard. Chemically this is good, because the films are together, and, as the plates are held together when packed, it is good mechanically.

In two out of these three instances it will be observed that sixteen-year-old gelatine plates, packed in the ordinary way, but kept, we may suppose (although the report is silent on the point), under careful conditions, yielded, after all that lapse of time, by the judicious use of restraining bromide in the developer, negatives described as fair and tolerable. Such a result is matter for equal congratulation and surprise to all concerned.

The report of the Philadelphia Committee, though it is obviously of little scientific value, as the whole of the conditions were not ascertainable, is yet of great practical interest, for it shows that gelatine dry plates may retain their workable qualities largely unimpaired for a greater length of time than was suspected, we may conjecture, when the three boxes of plates on which the experiments were made were dated and put away.

In conclusion, we may say that we are indebted for the data we have quoted to the *Journal of the Photographic Society of Philadelphia*, a most admirable publication, to which we always turn in the assurance that it contains matter of very great practical interest to photographers.

Forecasts of the Weather by Balloon.—Last week we made some comments on the forecasts of the weather as issued by the Meteorological Department, and alluded to the fact that it proposed to give up the Ben Nevis Observatory, the highest one in the United Kingdom. We now read that the Royal Prussian Meteorological Institute in Berlin is about making arrangements for the systematic examination of the higher strata of the atmosphere by means of special apparatus. In the grounds of the Aeronautical Observatory, in a suburb of Berlin, registrations of the atmospheric conditions at a height of three to five thousand metres will be carried on, if possible, day and night, with kites and kite balloons. The automatic registering apparatus, which notes the pressure, temperature, humidity, and wind velocity at these heights, is to be taken up by a kite balloon connected with the earth by wire, and is to be inflated with hydrogen. From the report it seems that the greater height will be obtained by a series of these kite balloons, each some 500 metres below the other. It has been found that by this system a height of 4500 metres has been attained by kites without balloons. It is added that, judging from the experience hitherto gained in casual experiments, the regular investigations which it is proposed to conduct should lead to important results. It is to be hoped that our Meteorological Department will watch the results that follow the Berlin systematic investigation of the upper strata of the atmosphere and profit by them. These elevated observatories can be established anywhere, without the aid of mountains. One might be instituted in a suburb of London—say at Brixton—and its cost need not be great. Any how, the idea is well worthy of consideration, as it might lead to more accurate forecasts of the weather than we now get.

Free Portraits.—Some photographers have announced that they will take, free of charge, a portrait of any volunteers who are going to serve their country in South Africa. In an evening contemporary we read that a photographer in the suburbs of the metropolis had intimated that "any soldier going to the front may have his photograph taken, free of charge, on applying at _____'s Studio _____." All this reads patriotic enough, but one cannot help wondering if it is really done out of genuine patriotism, or whether it is undertaken with a view to ulterior profit? It may appear, perhaps, a little ill-natured to even suggest such a question, but it is not altogether an unnatural one when we consider the facts. Of course "Mr. Atkins" will give the first proof to his wife or "best girl," but probably parents, brothers and sisters, and others, will want duplicates, and, of course, they will have to be paid for, hence a profit to the public-spirited photographer. Further business will probably accrue to him in the shape of enlargements in the event of the soldier being unfortunately killed. With these facts in mind, one is inclined to question if this "generosity" is actually so disinterested as appears on the surface. One thing, is however, certain, and that is, it will bring grist to the mill of the plate, paper, and mount-makers, as they are not sufficiently "patriotic" to supply their goods gratuitously to the photographers who take the portraits of those leaving for the seat of war.

The Lantern in Church Services.—"White's Weary Wait," illustrated by limelight views of Ladysmith and district, was the topic of the Rev. W. Carlile, at the St. Mary-at-Hill Church, on Sunday last. It is now some years since the Rev. Mr. Carlile adopted the lantern as an adjunct to his services, and it has proved the means of attracting congregations that he would not, presumably, have had otherwise. Mr. Carlile's innovation might well be followed in other localities in the poorer districts, as a means of securing a congregation and then ministering to it, and thus bring about good. Many of the lower classes in London would, no doubt, be induced to visit a place of worship on Sundays if there were something interesting to see, and would possibly profit from what they would hear. As the Rev. Mr. Carlile's experiment has proved so successful, it is a little surprising that it has not been followed by other clergymen who minister in some of the poorer and lower districts of this great metropolis. But there—the Church is very conservative. By the way, the title, "White's Weary Wait," suggests that views taken in beleaguered Ladysmith during the prolonged siege—and, no doubt, there are many photographers there—will, if published hereafter, command a large sale, whether as lantern slides or as paper pictures. No doubt, enterprising publishers already have an eye to that, and the profit to be derived therefrom.

Balloons and Photography in Warfare.—At the end of last week surprise was very freely expressed as to the reason for General Buller again retiring across the Tugela. It now transpires that he was guided to do this from a balloon observation. The balloonist found that the enemy had a large battery of powerful guns, cunningly masked, which could not have been discovered except from a balloon, and thus the troops were saved from a carefully laid death-trap. The observations were made with the aid of field glasses, and we do not read that photography was invoked. Had it been, and a tele-photo lens employed, the general himself would have, perhaps, been able to better realise the state of affairs than he could by the verbal description of the balloonist.

Eclipse Suggestions.—At the meeting of the British Astronomical Association, held on the thirty-first ult., a number of suggestions were made for the valuable application of photographic aid, even with small and simple apparatus. Photographs of the corona, the President said, should be taken on a sufficiently satisfactory scale with fixed camera, and therefore they need have neither equatorial nor driving clock. Instantaneous exposures might be given, and exposures up to one second, if they had the image of the

corona on a scale of not than half an inch to the sun's diameter, would be quite permissible, and would secure a fairly dense image, even to a considerable distance out.

THEN there were a large number of miscellaneous observations that a photographer might make. Miss Bacon, the President pointed out, took, in 1898, in India, a series of photographs of the landscape at regular intervals before the eclipse, and the result was to give a very striking picture of one way in which the illumination diminished as the eclipse came on. It seemed to him that the experiment might be repeated, and with a very much larger number of photographs on the next occasion, and this at several stations. Again: he would like to see repeated the experiment (for which Mr. Gore and Mr. Johnson prepared the plates, the exposures being made by Mr. E. W. Johnson) of the brightness of the general corona. A plate was exposed for a graduated series of seconds, or else under a sensitometer, to the full light of the corona, not in the camera, but simply by exposing the plate. In that way they might obtain a useful record of the total brightness of the corona from eclipse to eclipse, such as before the Indian eclipse had never been secured. It will thus be seen that ardent photographers desiring to help the cause of scientific investigation might do well to make their holiday at such a time as would enable them to join one or other of the eclipse observation parties we have on previous occasions referred to.

CHLORO-CITRATE EMULSIONS, WITH CHLORIDE OF COBALT AND A LARGE PROPORTION OF ORGANIC ACIDS, OR THEIR SALTS.

[Translated from the *Photographische Correspondenz*.]

MONSIEUR A. BLANC has recommended the use of chloride of cobalt for the preparation of chloro-citrate of silver emulsion, in place of the chlorides in general use for the purpose, such as chloride of ammonium or soda. The emulsion which he recommends is prepared in the following manner:

A.	
Gelatine	9 grammes.
Five per cent. solution of chloride of cobalt	6 c. c.
Neutral tartrate of ammonium	2 grammes.
Citrate of ammonium	0·5 "
Water	70 c. c.

B.	
Citric acid	2·3 grammes.
Water	20 c. c.
Citrate of silver	2·5 grammes.

The two solutions are mixed together at 70° to 80° C., and to the emulsion thus prepared 5 c. c. of shellac solution and 10 c. c. of alcohol are added. The paper should be coated after the emulsion has stood twenty-four hours. Blanc calls the shellac solution "preservative emulsion." It is a very dilute solution, formed by dissolving 5 grammes of pale shellac in 15 c. c. of alcohol (ninety per cent.) and pouring it into 100 c. c. of boiling water. It is then filtered through cotton-wool. When the alcoholic solution is diluted with water, most of the shellac is, of course, precipitated in a mass. A rather cloudy fluid remains, containing very little resin, which is mostly held in free suspension.

In 1897 I published directions in the *Photographische Correspondenz* for the preparation of a chloro-citrate emulsion, with which printing-out paper of very good quality might be made.

According to these directions the following solutions should be prepared:—

A.	
Nitrate of silver	32 grammes.
Citric acid	8 "
Water	160 c. c.

B.	
Gelatine	96 grammes.
Chloride of ammonium	2·8 "

C.	
Tartaric acid	2·8 grammes.
Bicarbonate of soda	1·4 grammes.
Alum	2·8 grammes.
Water	140 c. c.

A. The nitrate of silver is dissolved in hot water.
 B. The gelatine is first allowed to swell in the water, and then dissolved by heat. The chloride of ammonium is subsequently added.
 C. The tartaric acid is first dissolved in the water, then the bicarbonate of soda, and lastly the alum.

B and C are heated to 50° to 60° C. and mixed together. C is also heated to 60° C. and added to B and C in yellow light. The emulsion is kept a short time at 40° to 50° C. to ripen. It is then filtered and ready for coating.

Paper of comparatively high sensitiveness and great brilliancy may be prepared with this emulsion.

In its composition it differs considerably from Blanc's emulsion, as may be seen at a glance from the following table, in which both emulsions are set out side by side for 1000 parts of solution:—

Constituents.	Monsieur A. Blanc's Chloro-citrate Emulsion.	E. Valenta's Normal Chloro-citrate Emulsion.
Gelatine	82 grammes.	96 grammes.
Chloride	2·7 grammes $\text{CoCl}_2 = 55$ c. c. of 5% solution.	2·8 grammes NH_4Cl .
Tartrate of ammonium or soda	18·2 grammes of ammonium tartrate.	2·65 grammes tartrate of soda.
Citrate of ammonium	4·5 grammes.	—
Citric acid	21 „	3 grammes.
Tartaric acid	—	1·55 „
Nitrate of silver	22·7 grammes.	32 „

Disregarding the substitution of chloride of cobalt for the usual corresponding salts of sodium, or ammonium, which offers no appreciable advantage, as shown by the experiments which I made some years ago, we find, in comparison with other published formulæ for the preparation of emulsions of this class, that this new process is characterised by an exceptionally large proportion of citrate and free citric acid, whilst the amount of silver is also smaller than in the emulsion associated with my name.

From these circumstances it is not difficult to foresee that M. Blanc's emulsion should give very pure and vigorous prints, and that the paper should be of good keeping quality; but, on the other hand, its sensitiveness should leave much to be desired.

In order to ascertain the correctness of these suppositions and to obtain some idea of the value of M. Blanc's formula for the preparation of a printing-out emulsion, I made a certain quantity according to his directions, and coated some sheets of paper with it by means of a coating machine. The emulsion coated very smoothly upon good baryta paper and the film was even and of yellowish colour. The tests made gave the following results:—

The sensitiveness was 0·3, taking freshly prepared albumen paper as 1.

The range of gradation was 15° according to the scale of Sawyer's photometer. Degrees 0 and 1 were bronzed.

The prints were of a muddy violet tone. With the combined bath the prints toned very evenly, but with the sulphocyanide bath there was a tendency to stain. The colour of the finished prints was an excellent photographic tone and the high lights were pure white.

Printing-out paper prepared according to the formula recommended by me had the qualities of a good gelatine paper, with regard to resistance to mechanical influences; but, taking freshly prepared albumenised paper as 1, its sensitiveness was 3 to 4. It was consequently as fast as good commercial collodio-chloride paper.

Its range of gradation was also much larger, being 17° by the scale of Sawyer's photometer. The prints are purple brown and tone easily and evenly, whether in the combined or the sulphocyanide bath. With a plucky negative the prints are vigorous and pure.

With reference to the keeping quality of M. Blanc's printing-out paper, this should be due to the large quantity of citric acid which the emulsion contains rather than the addition of the "preservative emulsion." The small quantity of resin which the latter contains should not exercise much influence.

Although Blanc's emulsion gives very fine prints, full of detail, and the paper prepared with it certainly keeps well, I do not think it satisfies the requirements of the professional photographer. The paper prepared with this emulsion is much slower than albumenised paper, whilst most of the commercial gelatino-chloride papers are much quicker. This advantage is not compensated for by the better keeping quality of the paper.

PROFESSOR E. VALENTA.

REMARKABLE PHOTOGRAPHS OF ELECTRICAL EFFECTS.

In last week's *Nature** appeared a letter over the signature, "Sydney Webb, Dover," followed by a long explanatory article by Professor Sir G. G. Stokes, illustrated with a number of most singular photographs taken by the first-named writer at Dover. The interest of these pictures lies in the hitherto unnoticed effects shown in them as following upon lightning flashes. During the course of a thunder-storm the camera had been pointed at the direction in which the flashes were most vivid, and, in so doing, one or more of the electric lamps that supply Dover with its artificial light were necessarily included. "Upon developing the few exposures made it was noticed that, whether or not the picture took in the flash—and in many cases this did not appear at all—there was exhibited upon the films the light of the permanent lamps, and that from them a flow of electricity proceeded towards the ground in an irregular line."

The first photograph with no flashes showing gives us three large discs representing the arc lights; from such there is a pendent dotted line. Then we have a flash picture with the lamp "tails" forming a knotted intricacy, while, in the next, the tails are more like a long whip lashed horizontally. Another gives us four perpendicular tails, while, in the fifth, their erratic course is perfectly bewildering, and still another shows a grand mingling of arc and glow lamps, but yet with the tails or streamers going almost perpendicularly to the earth.

Professor Stokes esteems the subject of sufficient interest to justify a long argument as to the various possible explanations, but, these being more suited to the pages of an electrical journal, we do not deem it necessary to bring them before our readers, the more especially as the whole article may be found by the reference we give. We may refer to one of the Professor's possible explanations, as it links the whole with photography. He says: "If the wireless telegraphy theory which I have ventured to throw out be the true account of the Webb discharges, it seems that by imitating, with any necessary modification, the receiving apparatus, and introducing a telephone, as has been done with great advantage by M. Turpaine in his researches, it might be possible simultaneously to see and hear a flash of lightning." Thus we should be in possession of a most remarkable triad of effects from a lightning flash—we should see it, hear it, and finally have it recorded by means of photography. It may be observed that Professor Stokes points out that at present we are not actually certain that the passage of the electric current through the arc lamps at the time of the flashes is a necessity for the production of the tails or streamers, but, "as the lamps are wanted for public lighting, the experiment could not well be made of disconnecting one from the works when a thunder-storm was impending in the evening, and seeing whether the one disconnected would give a discharge like the others." He thinks the current necessary.

We can cordially recommend to our reader's notice Mr. Webb's suggestions in regard to further elucidation by photographic means of the cause of these singular phenomena. He writes: "I need only add that I hope, when a thunder-storm visits a town illuminated by electricity, photographers will, both in daylight and after dark, expose a few plates for the elucidation of the thoughts suggested to us. I say in daylight, for the camera will often record impressions that our eyes cannot see because of other external surroundings, as instanced by my noticing upon one occasion with the unaided eye a stream of electricity descending from an arc lamp towards the earth, which I should assuredly never have seen had I not learnt from these photographs that such a phenomenon did exist." We may on our own account make the suggestion that it would be useful when setting up a camera under ordinary conditions to include if possible, and at not too great a distance, one or more ordinary gas lamps, and to observe if streamers were to be found emanating from them also, as a possible alternative referred to by Professor Stokes, only treating the standards holding the arc lamps as mere pillars of iron connected with earth, and not as necessary components of a disused series of artificial electrical conductors.

WINTER PHOTOGRAPHY.

THE weather during the past fortnight or so has been all that could be desired by those who have been anxious to secure photographs of winter scenes, and, if they have not availed themselves of the opportunity, they have only themselves to blame, as such a chance may not recur, perhaps, for a year or two. The snap of winter has been pretty general throughout the country, and, we learn, has brought with it considerable

* *Nature*, February 8, pp. 343 et seq.

inconvenience to many in the shape of frozen and burst water-pipes, &c. These troubles, in most instances, might have been avoided had a few precautions been taken beforehand, such as we recommended a month or two ago. Then we reminded our readers that, in this fickle climate of ours, there was no telling how suddenly severe weather might be amongst us. We certainly had but short notice of this spell of it, and many of those who were not prepared for it have regretted it since.

There are other inconveniences, though unsuspected by some, arising from the abnormal and sudden cold. Since the severe weather has set in we have received several letters from correspondents, detailing troubles. These are mostly to the effect that, though the writers are convinced that the plates have been fully exposed, the image comes out very slowly and behaves very much as under-exposed plates would do, though, with prolonged development, full detail is obtained, but with a total lack of printing density. This trouble is simply due to the abnormally low temperature we have had of late. The remedy is to combat that in the dark room, keeping it up to from 60° to 65° F., and the developing solutions and the dishes up to a similar temperature. Another cold-weather trouble is blistering of the film on the plates and on prints. If either of them are taken straight from the fixing solutions and put direct into water as taken from the tap, where it is but a degree or two above the freezing point, blistering often happens—more often than not. The remedy should be obvious to all. Another trouble connected with cold weather is yellow stains on prints, due to the coldness of the fixing solution. When the fixing bath is very cold, its action is correspondingly very slow, and, unless a much longer time in it is given, imperfect fixation and yellow stains are the result. In this case, too, the remedy is obvious.

THE TREATMENT OF THE CUSTOMER.

HAVE you ever been visited by some one who knew some one who made lovely photographs? He or she will tell you of the altogether delightful work done by this friend until you feel that you are very small indeed. I do not object to the amateur—and I could not mend matters if I did—but I do not forget that I am a professional man who is making a living by the practice of his art. For the unfortunate photographer who considers it necessary to undertake business at rates reminding one of a Dutch auction I have more pity than sympathy, writes F. Bennett in *Wilson's Magazine*.

One of my best customers called on me some months ago accompanied by a younger lady friend. The new arrival was an amateur photographer, and wished to photograph her friend—my old customer—in my studio. She would do the posing and exposing, and I could "do the rest." The exposures were duly made, on my plates, in my camera, and every one was satisfied. Then I asked to be allowed to myself make a few attempts. After my visitors had gone I duly developed the negatives; then came the diplomacy. From all the amateur attempts I made prints. The light was crude, and the results gave heavy shadows and a look of antiquity—a sort of grandmother look. From my own negatives I selected the two best, and did a little, just a little, of retouching. If ever I did good retouching, it was on those two negatives. When the proofs were submitted I knew that I had won the day. I have no doubt that the amateur work caused a spasm, but I never heard of it again. But I do know that I got a very satisfactory order from my own negatives.

I have more than once been asked to supply retouched negatives in order that my customers may do their own printing. I make it a rule that all negatives remain in my possession, and invariably refuse such requests. I cannot blame people for asking this, as some of us have to consider every dollar we spend, but I decided to take this stand, and have continued it. If you do take negatives in this way, get a good price for them. If you sell prints at 4 dollars a dozen, a negative is cheap at the price of a dozen prints. If you sell prints at 10 dollars a dozen, a negative is too valuable to sell. Just here let me digress a moment to protest against the mistake of fearing the "other man." Too often we will work cheap to secure some little order. It is very doubtful business, and generally wrong. And now for a case where I did what I have just been objecting to. A wealthy but bargain-loving lady came to me for a 17×22 enlargement. She was very particular in inquiring the price, which was 12 dollars for one print on Aristo-platino. But this she scouted as absurd, and announced that she had seen enlargements offered for 2 dollars. I at last agreed to her terms, and she was to call in ten days. I made the enlargement—a bromide—and I did not waste any time over it. It came out somewhat hard as to shadows, and decidedly chalky in the whites, but, then, what can you expect for 2 dollars? At the same time I made an Aristo-platino, and I

made a beauty, one fit to be hung at the Convention. The appointed day came, and with it the lady. Her enlargement awaited her on an easel, and I had not subdued the light. I let her wait a moment with her effigy before going down to the reception-room. There was trouble then, almost tears, and much indignation. But I stood my ground boldly, and maintained that it was good 2-dollar work. After some argument, I suggested that, of course, the print was open to improvement—for instance, and I pulled some narrow strips of gummed paper from my pocket. A few of these I placed carefully over the heaviest shadows—I had studied it all before—and at once the picture looked better. Then I opened the attack. I had taken the liberty of making an enlargement to suit *my* ideas of the value of the subject, having seen in it an attractive possibility for my show-case. The lady was all curiosity at once, and nothing would suit her but that I at once show this work. So I led to where it was placed, in a neat black and gold frame, and tastefully draped. What a contrast! The Aristo-platino was just too charming, and she must have it. Would I sell it to her for 5 dollars? No! But it would be of no use to me, and it was made now. I smiled. As a show picture it would be of use to me, and after its day was past I would destroy it. Now, here was where I held the trump card; I was quite ready to lose the sale, though I hoped to be successful. And successful I was. I demanded 15 dollars, or with frame 25 dollars, and, after a long haggle on her part—for I simply remained firm—in an endeavour to get picture and frame for 20 dollars, she took the picture only and paid my price. I could not have worked such a scheme with most people, but I study my sitters.

THE NEW FAD IN PLATINOTYPE DEVELOPING.

WHEN a picture has a good and a bad portion, it is a boon to the photographer to be able to keep the good and eliminate the bad, and thus cover up one's sins and delude an innocent public into thinking that we always do such work. It is also a very valuable aid if we can, while developing, strengthen or tone down any portion of a print we desire to, and of these two advantages I offer a few suggestions in connexion with the new fad of partial development of platinotypes with the brush and several strengths of developer. The appearance of these fragments is quite refreshing after the long years of plain prints we have endured, and, while I don't want to call the effect "sketchy," I should say that, for the lack of a better word, says Mr. Edmund Rawleigh in *The Photographic American*, they are best described by that one word, which saves a deal of further description.

The trick is simplicity itself, and it will require but a few words to describe it, and but few attempts on the part of my readers to accomplish it, though greater delicacy and judgment naturally come with practice. One requires a quarter-inch, half-inch, and inch camel's-hair brush, the first two round for the dainty work, the latter flat for spreading the developer over large portions at first. Provide three solutions of developer—using the W. and C. salts—one of full strength, one of equal parts glycerine and developer well mixed, and one not so strong in glycerine. A tablespoonful of each will do for a few prints.

Now, having our print ready, we pin it by its four corners to a board covered with clean blotting-paper, and with the largest possible-sized brush of the three, quickly paint over the main portions desired in the finished picture with the strong glycerine developer; taking care to have no excess of developer in spots, and especially not to lap over the edges of the main features that are being painted. The developer, being heavily retarded, will work slowly, but in a short time the portions painted over will appear, and it is then that judgment can be brought into play to the great advantage of the finished print from an artistic sense. Let us say we have a picture of a house, with long and deep verandahs about it, vines climbing up the sides of the house, and expanse of grass and pebble path for a foreground, and various inhabitants of the place seated in a scattering way from one end of the verandah to the other, while in the centre, before an open door, in a comfortable chair, rests the mistress of the house, with a couple of children playing at her side or listening intently as she reads an absorbing story to them. Fancy that picture! It was undoubtedly taken because the mother and children appealed to one's sense of the beautiful and artistic. In the shade of the verandah, with the vines dispersed around in a pleasing way, it attracted our notice, and we took it. But we took a lot of extraneous matter, some hard lines that did not balance well, and all those people scattered the length of the plate in anything but artistic grouping, and we don't desire those at all, yet we don't want to cut the picture down too much. We shall go about it thus: First make a platinotype print from the negative, pin it on the board, and we are ready

Dipping our medium brush in the glycerine developer, we at once cover, but do not overlap, the central figures, including in ragged strokes some portion of the right and a good deal of the left, where the ivy climbs up the house and posts so gracefully, making an irregular shape. After a short while, this all develops, and we are ready to see what touches are necessary to preserve the character of the picture, improve the composition, and strengthen the weaker portions if necessary. We need more strength on the mother's dress, as she is well under the roof of the porch, so with our small brush we apply strong, undiluted developer till proper values are gained. The ivy is very faint as yet, as it is green and requires something stronger than the weakest developer, so we apply a wash of medium developer, brushing it on in irregular strokes so that no edges are abrupt. Now, to finish the composition, we take the flat brush and the glycerine developer and wash on as much foreground as will help the composition, then with a few sketchy strokes complete sky and foreground, and the print is ready for the acid, which must be very strong for the first wash, say twice the usual strength advised by the makers of the paper. Two more baths in acid of the regular strength, a good washing, and the work is done in less time than I have taken to describe it. True, it's but a fragment, but it is after all, under the circumstances, like a snatch of an operatic air when that snatch represents a few bars of the most beautiful music in the whole opera. From that which was not pleasing we have made something that is pleasant to look upon; we have sifted the good from the bad, and made besides an agreeable change in our collection, something odd and out of the common. What more could be asked than these manifest advantages? The process will give pleasure to all, will afford free play to one's perceptions of the artistic, and will educate those who seek knowledge in composition. It is a great power in our hands which, used with discernment, will improve us and our work.

It is important in this work to avoid hard outlines, and yet I am sorry to say that will be the first, and probably the only, trouble the new fad will bring the beginner. It is not difficult to obviate this, after a bit of practice, by brushing with a not over-filled brush from within outwards, pushing the brush as one would a carpet-sweeper, rather than brushing with it like a painter would. The object of having the first acid bath very strong is to prevent the developer from spreading and thus destroying the arrangement so carefully made. The true inwardness of so many utterly bad pictures as are seen is that the photographer has seen a very beautiful bit in his expeditions, and, being attracted by that, has trained his camera upon it, and taken it, and, being unable to eliminate the surroundings, has produced a botch. Perhaps he has been keen enough to recognise the beauty of the picture, but inartistic enough not to recognise the fact that other elements are in the 5×7 or 8×10 , or any picture which detracts from the effectiveness of the thing which is admirable. Some one of greater perception may some day advise that man to cut the print down until the true picture only is included in the portion used. This state of affairs is now provided for in the new method, and will be found to satisfy all concerned better than the only other alternative, that of trimming the print. An 8×10 sheet, with one of these sketchy fragments in the centre, is certainly a very agreeable change, if not a wonderful improvement, from the conventional method of mounting a small print in the centre of a large card, and I advise a trial of the method by all interested. EDMUND RAWLEIGH.

DRAPING THE MODEL.

BEFORE the Photographic Society of Philadelphia recently Mr. William E. Partridge gave an illustrated talk on the subject, "Draping the Model." He said: Of all draped statuary that of the Greeks is the most beautiful. It was evidently based on their national costume, but I cannot give you a history of Greek clothing, nor shall I take the subject up in a scientific way. Two or three evenings would be required for a description, and as many more for showing the illustrating slides.

The Greeks differed from all other ancient people, so far as I know, in the one fact that they did not make clothes. The Egyptians, on the other hand, were tailors; that is, what you see of their clothing in the museums looks very much like that which adorns the clothes-line in the tenement house districts of New York on wash days. Many of their garments seem to have been transparent. The idea seemed to be to protect the body from the first rush of the wind' or air, but allow it to be as cool and as transparent as possible. Their sculptors cut the figure in stone and indicated lines of clothing outside. In drapery the Egyptians followed the Assyrians and all the northern races in making clothes which conformed to the person.

The Greeks, on the other hand, did nothing of the sort. They apparently cut their cloth to the proper sizes, hemmed the ends, decorated the pieces with lines of coloured embroidery, and, to use the slang of the day, "sewed buttons on it." That was all there was to it so far as the tailor was concerned. Of their under-clothing I know nothing. The sculptors have ignored it entirely, and it is not necessary for our purpose this evening.

The cloth most suitable for drapery and best adapted for artistic work in following the Greek methods needs a word or two of notice. A great deal of the Greek drapery seems to have been made from some sort of knit material. We can imitate the lines of folds of many pieces of sculpture in a knit fabric better than in anything else. Fine silks and silk shawls drape beautifully. Bunting answers the purpose admirably, but for the artist cheese cloth is generally the best thing available. It is easy to get, it is wide, and, as it is the only thing which would drape at all that I could find to-day in the shops, I shall use cheese cloth this evening.

Now, do not try to make clothes for your models. Follow the Greek method. This was simply to use the figure to hang the cloth on. Do that and you will get beautiful effects. If you borrow silk or camel's-hair shawls, you can use them with perfect safety and return them in as good condition as you found them, because it is not even necessary to sew buttons on. If you take a large bead, put it under the fabric and tie a string round it, you have all the button that is necessary to hold the cloth in place by means of a loop.

Now we come to the first step in making what by courtesy may be called a garment. The width of your piece must be, for the long and flowing principal garment, equal to the height of the model. If it is not to be unusually long, measure from the shoulder to the floor. It is better in making up such a piece, if you have to use narrow breadths, to have the seams run vertically, for then they can be hidden in the folds. Unfortunately, the seams in my cloth this evening are horizontal. They would show badly in a photograph. The length of the garment, or main covering of the body, must be equal to double the distance between the extended finger tips; ordinarily this is also a little more than twice the person's height. Fold this, and on each side of the centre place a button so as to leave an opening for the head. This opening must be the width of the model across the shoulders. Along this upper edge other buttons or clasps may be placed at two-inch intervals all the way out to the ends. This garment, put on over the head, has a closed side at the left, leaving the right open. Draping this without other additions, we can get all the beautiful vertical effects that may be desired, and at will expose either arm, either shoulder, or the whole right side of the figure. Unbuttoning one or more of the buttons allows it to slip from either shoulder. With only two buttons we have a sleeveless garment. If all of them are in place and others put close to the neck, we have the figure completely covered, and yet may expose the right side at pleasure.

Putting the girdle around the figure, we introduce an entirely new set of folds. Pulling the garment up through the girdle, and allowing it to fall, we have the short Diana-like dresses. With a crossed girdle or cincture over the shoulders we obtain a new series of folds. This confines the garment to the figure and develops its outlines. We still have the alternative of long sleeves or bare arms, and the open right side. Over this the Greeks frequently, for the beauty of the folds, put a mantle, consisting of a piece as long as the main garment, horizontally, but only half its vertical depth. This was buttoned on the shoulders and made the same exquisite series of folds as the under-garment. When the ends are cut off diagonally, or "bias," as the ladies say, they are exceedingly beautiful, and a set of diminishing folds like pleats can be obtained. Add to this a very long strip or scarf half a yard wide, and of indefinite length, to throw over the shoulders, to twist about the arms, or to festoon about the figure, and we have all the necessary materials for the ordinary drapery. To this the Greeks added something like a shawl, with this difference, that it was of lighter material and was not folded in the centre, but used in a single thickness. This they threw over the arm, carried around the figure, turned over the shoulder, and used it for a variety of wrappings. It makes an envelope for the head also.

THE EVOLUTION OF A PICTURE.

BEFORE the Birmingham Photographic Society, on Tuesday, February 6, Mr. John H. Gear, F.R.P.S., gave his lecture on "The Evolution of a Picture." The lecture embraced a valuable series of hints for the guidance of those who aim at producing something more than an ordinary photograph.

For development Mr. Gear strongly advocated the use of tabloids,

which, in his opinion, offered the most convenient means of securing accuracy in the constitution of the developer. Especially were they of use for development on tour, and the lecturer showed an exceedingly compact case stored with all kinds of chemicals in this concentrated form. For after-treatment of dense negatives Mr. Gear recommended the use of ammonium persulphate, which possessed the valuable property of attacking the dense parts first. A slide which had been purposely developed to undue density in the shadow portion was treated with ammonium persulphate, and the after-result exhibited in the lantern; the difference in density was very striking, and most of those present recognised that a great power was placed in the photographer's hands by the introduction of this chemical.

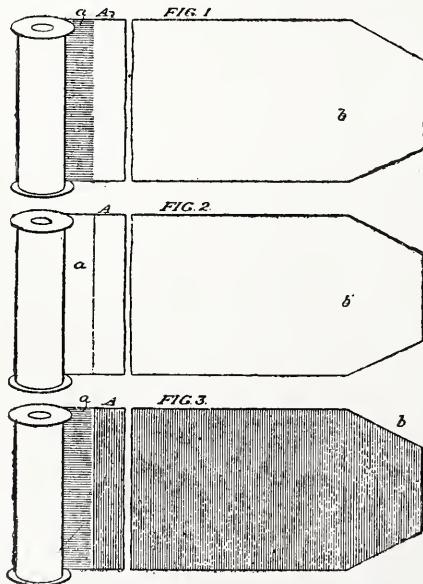
On the subject of picture-making Mr. Gear said that an ordinary photographic view, such as any one might take, could be converted into a picture by availing oneself of suitable conditions of lighting and by judicious after-treatment in mounting, &c. In illustration an excellent series of slides was shown, in which charming pictorial effects had been secured by the introduction of suitable clouds, &c.

In conclusion, Mr. Gear remarked that the danger of the modern tendency for broad effects in photography was that suppression of detail was often carried too far by persons who thought that, because Mr. So-and-So had secured a picture by throwing his lens out of focus, therefore similar procedure on their part would give a like result—a fallacy which, as Mr. Gear showed, has brought ridicule on the "fuzzy" school of photographers.

A NEW FORM OF DAYLIGHT CARTRIDGE.

THIS is the invention of Mr. A. W. McCurdy, of Washington, who, in the course of his description of it, says that, in the manufacture and use of daylight films or cartridges, it is the universal custom to provide a considerable length of black paper as a covering or enveloping body, to exclude the light and prevent the sensitised film from becoming "fogged" or "light-struck." A common plan is to extend the paper along the back of the film throughout its entire length, and to a considerable distance beyond each end; one end to be wound about the coiled or rolled film a number of times, and to fill completely the space between the heads of the spool so that no light may reach the film until the covering or enveloping portion of the paper is unwound therefrom. This is done mainly after the cartridge or roll is placed in the camera where it is properly protected.

Mr. McCurdy says he has ascertained, by repeated experiments and



working tests, and has demonstrated in actual working, that black paper is not essential. Celluloid prepared just as is the image-receiving surface, or ground or otherwise rendered impervious to actinic rays, will, if wound in several layers about the image-receiving portion of the film, effectually exclude all light rays that would affect the latter. The light-excluding or enveloping sections may, therefore, be mere extensions of the ordinary coated film, additional to the portion designed to receive the images. So, too, it has been found that white paper, and papers approximating white will likewise thoroughly protect the film.

Availing himself of this fact, and of the discovery that both celluloid and light papers will adequately protect the film, he makes or furnishes the film with a protecting section of such material. In other words, he provides the film with a covering or protecting sheet or section composed of material which in the developing and fixing baths and out of them possesses only such ingredients or components as are chemically inert

under all ordinary conditions of storage, exposure, development, or fixing of the film. A indicates the body of a film, of celluloid or other suitable material, having the image-receiving portion, a, coated with the usual emulsion or preparation, and sensitised to adapt it to receive the picture or impression produced by the light transmitted by the lens of the camera. Formed with and as extensions of the film, at the ends of the image-receiving portion, are enveloping or light-excluding sections, b b, here represented as integral with the intermediate section, a. These sections, b, may be rendered opaque or semi-opaque by pigment, colouring matter, or dye, introduced into the celluloid in the process of manufacture, and hence free from liability of being affected by the baths or by the moisture of the atmosphere; or they may be ground, subjected to the action of a sand blast, or in any other convenient manner made semi-opaque. Thus prepared, or even without special preparation, other than such as is given the image-receiving portion, the enveloping or light-excluding portion, if made of moderate length so as to wind several times about the coiled film, will effectively exclude the actinic rays, and protect the film from injury by light.

In fig. 2, the end sections, b b¹, are represented as formed of paper, or like material, which, however, will be free from any element or ingredient which shall be capable of separation out of the paper, either chemically or mechanically, under action of the atmosphere or of the baths, and at any temperature to which it would otherwise be safe to subject the film.

Fig. 3 shows the same construction as fig. 1, but indicates by surface shading the grinding, colouring, or other treatment of the celluloid or like material to render it impervious to actinic rays. It is found in practice that this is not essential, and that the celluloid may be left untreated, or in other words, that the emulsion or coating used on the body of the film, if carried over the ends or enveloping sections, will answer all requirements. It is to be understood that the enveloping portion will be provided at both ends of the film, and pointed to facilitate threading into the spools.

A "NEW REPRODUCTION PROCESS."

THE author of this invention, Herr Bierenz, of Vienna, employs, in the reproduction of pictures, photographs, drawings, and also of colour prints, original articles, and so on, a specially prepared plate, preferably of metal—such as zinc, copper, or the like—the surface of which is capable of receiving a device, transfer, or impression of the drawing, photograph, or the like, which it is intended to reproduce, as it already possesses that grained texture which is requisite for the "decomposition" pattern or design which reproduction necessitates.

The plate which he proposes to employ is produced as follows: After being first polished or smoothed down, it is, by any suitable means, subjected to the action of a sharp blast charged with sand, iron filings, or similar bodies, for an adequate length of time, whereby the "graining," already mentioned, is obtained, which renders the plate capable of receiving the image direct. It may be mentioned in this connexion that the resulting fine, though irregular, dotting in the graining of the plate is calculated to prove very beneficial to the effect of the reproduction eventually obtained, and that this advantage becomes manifest also in colour-printing, as it enables the possible unsightly effects of the juxtaposition of geometrical figures, into which the design has been divided (by means of stencil plates, squares, and the like) in the superposed printing of different shades of colour, to be obviated.

The following are the results which the process, involving the employment of the zinc (or other plate), grained as described, enables him to attain:—

1. Any given picture may be reproduced with suitable drawing materials, preferably fat chalk (crayons), or fat Indian ink, and so on, upon a plate, direct, so that it is ready for immediate etching, engraving, "rouletting," or photographing, it being important, in regard to these reproductions, that any necessary corrections in the picture, such as effacing, rubbing out, or retransferring, should be readily feasible. The fixing of a picture thus reproduced, in a manner adapted for printing, may be effected in a manner similarly to that hitherto employed, viz., by sprinkling it with some powdered substance, such as asphalt or the like, resisting the action of acids, and then dipping the plate in a bath prepared with certain acids, washing the same, and so on, until a plate adapted to be printed from is obtained.

2. Direct reproduction with the assistance of photography becomes possible owing to the fact that after the preparation of the grained plate with substances—such as chrome salts or the like—sensitive to the action of light, a picture drawing, or other object, may be directly photographed; the negative thus obtained may be developed, by the way, by the aid of a prism, even where the picture to be reproduced was, during the exposure turned down (or inverted). The grained sensitised plate (with gelatine film, which has been treated with chrome salts) is placed into the photographic camera in the same manner as an ordinary glass plate, and is then exposed. It is advantageous to have a strong light for exposing (full sunshine, electric light, or the like). The negative is then taken into the dark room and blackened in with soft or fat colour, treated with water and the shade portions cleaned from off the fat colour (which adheres to the gelatine which is still soluble) by the aid of wool or the

like. Hereupon it is dusted over with fine asphalt powder and the plate is now ready for burning and etching, by which latter procedure the picture is rendered ready for reproduction.

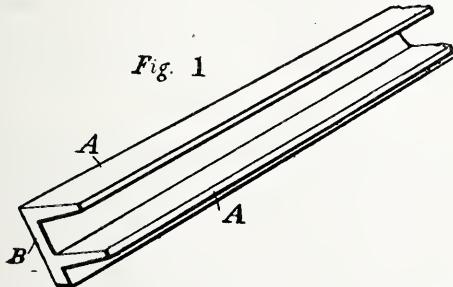
3. By the aid of photography the process will prove serviceable in directly preparing positive plates or images, as the decomposition of the photographic picture into variously shaded (dotted, hatched, and the like) parts, and consequently the employment of transparent, stencil, graining, or other similar plates or frames, avoided, the picture, or the like, to be reproduced, being taken in the well-known manner as a negative, upon a glass plate, the novel feature in this connexion being that the negative may be taken even by the dry, or gelatine, process. The negative plate is then placed upon the grained zinc, or other plate, which has been previously sensitised by being covered with a film of substances sensitive to the action of light, such as chrome salts and the like, the plate being then exposed to the light, whereby, upon the grained plate there is obtained a positive image, which in other respects, viz., for purposes of reproduction by printing, may be treated in the manner described in the concluding part of paragraph 1, so as to make it stand out more clearly and fix it more firmly for printing purposes.

4. The method, which consists in employing a grained zinc or other plate, is also suited to the purposes of chromography, the fineness of the graining causing the colouring of the image to appear clearer or purer than it would otherwise be; while in the case of parti-coloured designs, or pictures in more than one colour, the superposed colours become better assimilated and are brought out more fully; in addition to which the several successive photographic views of the picture or object, which have to be taken in this last-mentioned case, may—unless a transfer is intended—be conveniently treated by the simplified process above described, and be readily corrected in case of need.

5. Pictures may be transferred by fat printing from one plate—which may be lithographic stone, a heliographic plate, or the like—to a plate constructed in accordance with this invention.

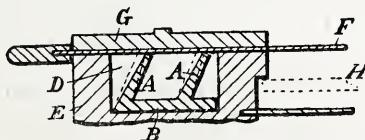
A FLEXIBLE SHUTTER FOR DARK SLIDES.

THIS is the invention of Mr. Bull, of Rochester, U.S.A. The shutter is formed of flexible indiarubber, and consists of the two yielding ribs, A A, united together by the base, B, which is inserted in a suitable recess, D, in the frame, E, of the plate-holder, in such manner that the strips bear



against the slide, F, or, when that is withdrawn, spring outwards and make contact with the cap or cover, G, to the recess, and thereby exclude the entrance of light. It will be observed that, when the edge of the slide is passing through the recess, both shutters cannot be open at the same

Fig. 2.



time. This invention is applicable to any size or style of plate-holder, either single or double, and it effectually prevents fogging of the plates, H. The shutter is preferably made of a length somewhat greater than the width of the slide.

THE ROYAL PHOTOGRAPHIC SOCIETY'S ANNUAL GENERAL MEETING.

THE Annual General Meeting of the Royal Photographic Society was held on Tuesday evening, the 13th instant, at the Society's house, 66, Russell-square, when a large number of members assembled, in spite of the extreme inclemency of the weather. The chair was taken by Sir H. Trueman Wood, M.A., who moved the adoption of the Report of the Council for the year 1899, from which the following are extracts:—

"There has been a net increase during the year of sixty-two members.

The Council are glad to note the increased interest taken by fellows and members in the extension of the list of subscribers to the Society, which has resulted in the above accession of members."

"During the year the Council have instituted a special monthly meeting for illustrated lantern lectures. The thanks of the Society are due to Mr. J. J. Vezey, who has undertaken the management of the lantern meetings, which have been an unqualified success, large numbers having been present on each occasion. The Council wish it to be understood that ladies are specially welcomed on these occasions."

"The total receipts for the year, including a balance of 138*l.* 6*s.* 10*d.* brought forward, amount to 224*l.* 11*s.* 11*d.* The total expenditure was 2001*l.* 1*s.*, leaving a balance of 244*l.* 10*s.* 11*d.*, the liabilities being half-year's rent of the Pall Mall Gallery 85*l.*, and on account of the affiliated societies of 55*l.* 9*s.* The amount received on account of the Guarantee Fund towards the expenses of furnishing 66, Russell-square, was 38*l.* 5*s.* 10*d.*, and the total amount expended was 533*l.* 15*s.* 3*d.*"

"For the first time in the history of the Society the amount received for subscription exceeded 800*l.*, the total, including back subscriptions, amounting to 886*l.* 17*s.* Exhibition receipts show a slight increase as compared with the previous year, total receipts being 485*l.* 5*s.* 6*d.*; but, in consequence of items for medals and Judges' expenses appearing this year, the expenditure also shows an increase, the net loss being 13*l.* 3*s.* 10*d.*

"The amount invested in Consols remains, as before, 500*l.*, and the total balance in favour of the Society, after making a liberal allowance for depreciation, is 1387*l.* 8*s.* 5*d.* In accordance with the usual custom, no account has been taken for outstanding subscriptions.

"The Council are pleased to announce that arrangements have been made for the transfer of the Annual Exhibition to the large and convenient accommodation comprised in the New Gallery in Regent-street. The increased accommodation at the disposal of the Society will enable the Council to give attention to the generally expressed desire that the Annual Exhibitions should be more comprehensive and representative of photography generally than has formerly been usual. In the New Gallery limitations of space, which hampered progress in the old Gallery, do not exist, and the Council confidently expect that a new and successful era for the Exhibitions will commence with the acquisition of the New Gallery. The Organizing Committee has the arrangements now in hand, and the prospectuses will be issued at an early date."

The motion for the adoption of the report was seconded by Mr. J. J. Vezey, and carried without discussion.

Mr. G. Scamell (Hon. Treasurer), in moving the adoption of the balance-sheet, compared it with that which he presented eight years ago, at the close of his first year of office, since which time some 13,300*l.* had passed through his hands. In 1892 the amount received for subscriptions (annual and life), and entrance fees was 411*l.*, and the income from those sources during 1899 was 1059*l.*, the number of members at present being 790, as against 453. The number of members elected was, in 1892, 30, and, in 1899, 129, and the increase in membership and income had been gradual and sustained. The actual loss on the last Exhibition at Pall Mall, taking into account certain matters which had transpired since the balance-sheet was made up, was only about 5*l.* All expenses in connexion with the furnishing of the Society's new house had been paid, and there was such a balance in hand that he thought it would not be necessary to call up any portion of the Guarantee Fund during the present year.

Mr. C. H. Oakden seconded the motion, and after a few remarks in which the Chairman referred to the very able manner in which the Treasurer had discharged his arduous and responsible duties, the balance-sheet was adopted.

The report of the Scrutineers, as to the voting for the election of officers and Council for the ensuing year, was then presented by Mr. E. Clifton, the result of the ballot being as follows:—President: Mr. T. R. Dallmeyer, F.R.A.S.—Vice-Presidents: The Earl of Crawford, K.T.; Mr. Chapman Jones, F.I.C., F.C.S.; Major-General J. Waterhouse, I.S.C.; Sir H. Trueman Wood, M.A.—Treasurer: Mr. G. Scamell.—Ordinary Members of Council: Messrs. Thomas Bedding; Thomas Bolas, F.I.C., F.C.S.; C. H. Bothamley, F.I.C., F.C.S.; F.A. Bridge; A. Cowan; W. E. Debenham; W. B. Ferguson, M.A., Q.C.; J. A. Hodges; Rev. F. C. Lambert, M.A.; A. Mackie; J. W. Marchant; Professor R. Meldola; E. Sanger Shepherd; J. A. Sinclair; John Spiller; J. W. Swan, M.A., F.R.S.; J. J. Vezey; E. J. Wall; H. Snowden Ward; and J. B. B. Wellington. The result of the voting for Judges at the forthcoming Exhibition was also announced, as follows: Pictorial Section: Dr. P. H. Emerson; Colonel J. Gale; B. W. Leader, R.A.; A. Horsley Hinton; and J. B. B. Wellington. The number of ballot papers received for the election of officers and Council was 232, of which 21 were invalidated from various causes; and, for the election of Judges, there were 231 papers, of which 14 were invalid.

The Chairman heartily congratulated Mr. Dallmeyer upon his unanimous election as President of the Society, and alluded to his long connexion with the Society, the valuable contributions which he had from time to time made to its *Transactions*, and his liberal gifts to the library and museum, especially his recent presentation of the focometer described by him in the first Traill Taylor Memorial Lecture.

The President then, amidst much applause, took the chair, and

expressed his sincere thanks for the honour which had been conferred upon him. He promised to use every endeavour to maintain all that was good in the traditions of the Society, to safeguard its interests, and to enhance its usefulness and influence; and, having regard to the valuable work which had been done by the able and distinguished men who had preceded him in the presidential chair, he asked the indulgence of the members if he came short of their expectations.

The proceedings closed with the passing of hearty votes of thanks to the retiring officers and Council, and to the auditors and scrutineers, the President alluding to the loss which had been sustained by the retirement of Sir W. de W. Abney, and expressing the hope that before long he would be persuaded to again give the Society the benefit of his highly valued counsel and assistance. Sir H. T. Wood also referred to the regret which was felt by every member at the fact that Major-General Waterhouse had found it impossible to continue to serve as Honorary Secretary, owing partly to other claims upon his time and attention, and partly to the ill health from which he had recently been suffering. The excellent services which had been rendered by Mr. A. W. W. Bartlett, the Assistant Secretary, were acknowledged in very complimentary terms.

The arrangements for future meetings include the following: On February 20, Professor R. W. Wood, of Wisconsin, will give a lecture, with a demonstration, on the subject of his diffraction process of colour photography, and will possibly also deal with sound photography. On February 27, Mr. Friese-Greene will read a paper "On Electricity in connexion with Photographic Action."

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

THE Annual General Meeting of the Delegates to the Affiliation was held on Tuesday, January 30, 1900, at 66, Russell-square, W.C., Mr. H. Snowden Ward in the chair.

The minutes of the last meeting were read and confirmed.

The annual report of the Executive Committee and the Treasurer's balance-sheet for the past year were read and adopted.

The report states that the number of societies at present in affiliation with the Royal Photographic Society is eighty-three.

At the Meeting of Delegates held on June 2, the direction of affairs was intrusted to an Executive Committee, composed of ten members with the Hon. Secretary and Hon. Treasurer, *ex officio*.

The Executive Committee have met six times since their appointment. Their chief efforts have been in the extension of the number of lectures available for circulation by the provision of the following:—

"Elementary Chemistry for Photographers," by C. F. Townsend. "Orthochromatic Photography," by E. Sanger Shepherd. "Flashlight Photography," by Alfred G. L. Philpot. "Photography in the Field," by G. T. Harris. "Printing Dodges," by G. J. T. Walford. "Rejlander—His Life and Work," by A. H. Wall.

During the year 1899 the Affiliation has been the means of filling over two hundred meetings by the loan of lectures and slides, and many more for the coming year are already similarly provided for.

A strong desire has been manifested for the encouragement of an organized interchange of lecturers. The success of such a scheme rests primarily upon individual action by the societies themselves, but the Committee have taken steps to draw the attention of the societies to the movement, and hopes to be in receipt of information shortly which will enable a start to be made during the present session.

The Committee have arranged for the despatch of lectures ten days before the date of the meeting, to facilitate attempts to procure a qualified reader. Abstracts of lectures containing formulae and working instructions are in course of preparation, and will be issued in any number at cost price, for the convenience of those who desire to act upon the hints contained.

The travelling collection of pictures, many old pictures being replaced by later work, has been rearranged. It continues to form a valued feature of the work of the Affiliation, many applications for the year having been received and granted. The Committee would urge prompt application by societies wishing to burrow the collection to enable a satisfactory route to be marked out, and to reduce the expense of carriage to a minimum.

Early in the year the Council of the Royal Photographic Society invited the societies to express their views upon the utility of the Affiliation scheme, and a large number of suggestions was received, which were passed to this Committee for consideration.

Acting on the suggestions contained in the letters, the Executive Committee have arranged to issue an annual pamphlet to every member of the affiliated societies, giving concisely all information relating to the societies concerned, such as headquarters, conveniences, the list of lectures and slides, interchange of lecturers, travelling lecturers, and other benefits to which the subscribers may be entitled.

The Committee have taken steps to ascertain what might be done in the provision of travelling lecturers. They are in communication with a number of well-known lecturers on popular subjects, and hope to be able to announce an arrangement by which, if a sufficient number of societies

apply, these gentlemen will give their services at reduced charges for fees and expenses.

The Committee have arranged for the existing Board of Judges to undertake the judging of lantern slide as well as print competitions.

Mr. H. W. Bennett has kindly lent his lecture on the "Pictorial side of Architectural Photography," first read before the Royal Photographic Society on November 21. His lecture on the technical branch of the same subject has been in circulation for some time past.

Arrangements have been made for the revision, as opportunity offers, of the lectures which have been in circulation some time. The matter will be brought up to date, and damaged and broken slides replaced.

The Committee find that the slides now in the possession of the Affiliation have been lent to nearly, if not all, of the societies, and in some cases more than once. They hope before long that efforts now being made will result in the addition of new and interesting sets, but they feel sure that there must be many interesting slides, or sets of slides, in the possession of the societies affiliated which might be available for a season on loan to other societies. Societies willing to lend such sets are requested to communicate with the Secretary.

The Treasurer stated that, of the balance of 55l. 9s. in hand, some 35l. had been appropriated for lectures, &c., leaving about 20l. actually available.

It was agreed to request the Earl of Crawford to continue to occupy the post of Chairman of the Affiliation.

The following officers were appointed: Hon. Treasurer, Mr. George Scamell; Auditors, Messrs. F. W. Levett and F. W. Bannister; Secretary, Mr. A. W. W. Bartlett.

The following Delegates were appointed the Executive Committee for the present session: Messrs. R. Beckett (Hackney Photographic Society), C. Churchill (Woolwich Photographic Society), S. H. Fry (London and Provincial Photographic Association), C. G. Emery (Chiswick Camera Club), A. Mackie (Royal Photographic Society), J. C. S. Mumford (North Middlesex Photographic Society), E. Marriage (Woodford Photographic Society), C. H. Oakden (South London Photographic Society), J. A. Sinclair (Royal Photographic Society), and H. Snowden Ward (Royal Photographic Society).

A vote of thanks to the officers for their work during the past year was carried unanimously.

It was agreed that a meeting of the secretaries of metropolitan societies should be held twice a year—March and September.

It was agreed to instruct the Executive to approach the editor of the *Photographic Journal* respecting the announcement therein of affiliated societies' fixtures.

The matter of the provision of a set of slides of Tinworth's subjects was also referred to the Executive.

THE MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

FROM the fifteenth annual report of this large and flourishing photographic Society we take the following extracts, which show that the M.A.P.S. is in a very sound and healthy condition. We congratulate the members and the hard-working band of officers responsible for the working of the Society on the eminently satisfactory condition of affairs:

At the last Annual Meeting the Society consisted of 360 members, and since then 40 new members have been elected, making a total of 400. We have to record the loss of one member by death, 35 through removal or resignation, and 28 have been struck off the roll of membership for non-payment of the subscription, leaving 336 members on the books of the Society.

During the year ten Ordinary Meetings, one Special Lecture Meeting, the Annual General Meeting, the Annual Social Gathering, and the Annual Exhibition of Members' Work have been held.

During the year 114 issues of books have been made to members. This year 9s. 3d. has been received from fines, which, together with 6s. 7d. brought over from last year, makes 15s. 10d.; out of this 4s. 7d. has been paid for back numbers to complete volumes, postages, &c., and 11s. 3d. carried forward to next year.

The apparatus has been poorly patronised this year. It is surprising to find our members making such little use of our collection. This year the dark-room lectures have commenced at 7.30 instead of 7, the later time proving more convenient to the majority of our members.

The lectures and demonstrations have been fairly well attended, with the exception of those held during the summer months. These have been so sparsely supported that it is worth considering whether we should have fewer lectures in the summer. The Committee has considered the advisability of getting a better room for the dark-room demonstrations. An attempt was made to obtain the Magazine Room at the Athenaeum, but unfortunately it was not available, and so for the present the matter lies in abeyance.

During the past year the Survey Committee have brought their labours to a close with a feeling of regret that much more has not been done to fulfil the ideal scheme as proposed by the late Rev. H. J. Palmer, M.A. The result of the survey is far from being complete, but the Council and Committee feel there is nothing to be gained by continuing the work. Two sets of prints have been offered and accepted by the Library

Committees of the Manchester and Salford Corporations, who have kindly undertaken to defray the cost of mounting and binding to the satisfaction of the Society's representatives (Messrs. Coulthurst and Wheeler). A third set will be mounted and bound for the Society's library, for reference only, the fourth and remaining set being placed in the hands of the Society's Treasurer for safe keeping until disposed of at some future time. The Committee, in closing their labours, beg to thank those members who have rendered such valuable help and assistance, and our only regret is that the band of workers was not much larger.

This year there has been organized in connexion with the Society a Postal Club for the circulation of prints for criticism, &c. At present the Club has a membership of twenty, each member receiving a folio of prints about every month. During the year upwards of one hundred prints, selected from the folios, have been exhibited at the Society's monthly meetings at the Athenaeum.

The Sub-Committee have decided to reduce the subscription for 1900 to 1s. 6d., with an entrance fee of 1s. for new members. The Club is now in fair working order, and it is expected that during 1900 it will be more successful than ever, and by providing prints for exhibition at the Society's meetings will help to make them more interesting.

The following is a list of the officers elected at the recent annual meeting:—

President: J. W. Wade.—*Vice-Presidents*: S. L. Coulthurst, the Rev. H. W. Dick, G. E. Mellor, and G. H. B. Wheeler.—*General Committee*: W. M. Blackshaw, W. H. Bowman, H. B. Bradley, F. W. Burton, T. Glazebrook, P. Hancock, A. Handford, J. C. Hope, J. W. Price, L. Scholes, Jas. Shaw, J. Wood Smith, and J. W. Young.—*Librarian*: J. W. Young.—*Editor of Magazine*: J. Wood Smith.—*Hon. Treasurer*: Chas. Dawson, 10, Chepstow-street, Manchester.—*Secretary*: F. W. Parrott, 3, Elm-road, Altringham.—*Sub-Committees*—Record: W. H. Bowman, the Rev. H. W. Dick, G. E. Mellor, J. Wood Smith, and J. C. Hope (Hon. Secretary); Demonstrations and Rooms: W. M. Blackshaw, S. L. Coulthurst, A. Handford, G. H. B. Wheeler, Jas. Shaw (Hon. Secretary); Lantern: P. Hancock, A. Handford, J. W. Price, L. Scholes, and F. W. Burton (Hon. Secretary); Postal Club: W. M. Blackshaw, J. C. Hope, and H. B. Bradley (Hon. Secretary).

The President and Secretary are *ex-officio* members of all Sub-Committees.

THE EDINBURGH PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.

On Saturday the Annual Exhibition of the above Society was opened in their rooms, 38, Castle-street, Edinburgh. There is a total of 284 entries, which, compared with 301 last year, shows a slight falling off; but the Exhibition is a good one, well and tastefully hung, considering the disadvantages of the room in which the photographs are shown. The Society, it is needless to note, is an old one, founded in 1861, and seems to renew its vigour with the increasing years. There is an absence of any very outstanding work on the walls, but the general level maintained is good.

The most important classes, naturally, are the "open to all," and of these the "Landscape" has forty-three entries, and the "Portraiture" has fifty-four, comprising representative work from most of the leading district professionals, along with those from other parts, with a goodly sprinkling of "class" amateurs.

In Class I. (open to all)—Landscape, Seascape, and Architecture—the gold medal is awarded to Mr. James Patrick, Edinburgh, last year's winner of this award, for *The Miry Beasts retreating frae the Plough*. The brown carbon print shows two horses, the off-side one ridden by the ploughman, returning home from the day's work. The picture is diffused with the mist and mystery of the evening light, and is an entirely different view from his *A Stilly Hamlet Home*, the winner of last year. The whole picture hangs well together, although a little more definition in the shadow of the hedge to the right might be an improvement. Mr. Patrick has reason to be proud of winning this position two years in succession. The silver medal goes to *A Spring Pastoral*, by Arch. Cochrane, Hurlet, a study of sheep and lambs under trees, through the branches of which the shimmering sunlight plays. This print was hung in the Royal, and reproduced in the official catalogue, so that it will be well known to most of our readers; the grouping of the animals is happy, but, unfortunately, the pose of the lamb to the right is not all that could be desired. Mr. Alex. Allan, Edinburgh, who had a series of victories at the Exhibition of last year, takes the bronze medal with *Landscape*, a river scene, decorative in treatment, and therefore hardly to be criticised as an ordinary photograph, otherwise it would be betokened hard; as it is, it is a good specimen of "decorative" work.

A number of exhibitors in this class show snow scenes; but, as a rule, they have missed the beauty of the snow and the results are "contrasty" and hard; now that the snow has come again, they should have another try and endeavour to render the snow with some appearance of texture.

In Class II. (open to all), Portraiture, Figure and Animal Studies, the gold medal is gained by that well-known and popular Birmingham amateur, Mr. W. Smedley Aston, with a portrait study, *Mrs. Arthur*

Gaskin, in warm black carbon, a break-off, for which we are thankful, from the almost universal brown tones now prevailing. The picture, like all Mr. Smedley Aston's work, is simple and free from eccentricities, the figure is shown in profile, the face in strongly lighted—it is a good face—and the lace shawl and the lady's hand are pleasingly subdued, so that it is the face that secures our attention, and this is an axiom of portraiture that is always being preached.

The silver medal is awarded to Mr. R. S. Webster, Edinburgh, for *At Home*, a picture that was shown at the Royal this season. The picture is one of those "at home" series of which Mr. Webster has been making a speciality of late—it would be worth the while of many of our professionals to follow his lead in this respect—it shows a lady dressed in white, seated beside a fireplace, the arrangement is good, and the treatment of the white dress is a splendid bit of work. The picture conveys a good idea of the softened light of an ordinary interior. Mr. W. Reid, Wishaw, gains the bronze medal with *Horses in a Harvest Field*, a fine trio of horses in a harvest field, the treatment betokening the influence of the Reid of Wishaw; the exhibitor is, we believe, a son of Mr. Charles Reid of "animal" fame. A certificate goes to Mr. James Auld, Edinburgh, for *In the Olden Times*, a modern girl in "olden" dress, but a pleasing portrait, withal.

Class III. (open to members), Landscape, Seascape and Architecture. Gold medal, Mr. James Burns for *'Tis Winter Fairly*, a very satisfactory attempt at the portrayal of winter, simple in treatment. Mr. George Clelland gains the bronze medal with *Barnclinth*, a good rendering of the play of sunlight through trees; the figure in the foreground is not an improvement.

Class IV. (open to members), Figure or *Genre*, including Animals.—Here the silver medal is gained by *The Wind Bloweth from the Sea*, by Mr. James Burns. This is also the best picture by an amateur member, and gains the President's gold medal. It is a small print in bromide of a Dutch girl, standing on the seashore, gazing seaward. Small in quantity but great in quality, it at once attracts the eye and rivets the attention of the onlooker. Simple in *excelsis*, it is yet complete and satisfying, and a picture to be remembered. Mr. Burns is to be congratulated on it. The bronze medal is gained by Miss Eleanor M. Gray, with a portrait of *Mason Hunters*, R.S.W.; a good honest bit of work, even although the smirk on the face of the sitter is distracting.

Class V. (open to members), Still Life, including Fruit and Flowers.—This is a very unsatisfactory class; only seven prints are forward, and the Judges very wisely give no awards.

Class VI. (open to members), set of pictures, not exceeding three, being work done by camera held in hand.—Mr. J. C. McKechnie gains the silver medal with three seascapes, of which we prefer *A Stormy day at St. Abbs*. Mr. J. Yate Thomson gains the bronze medal with three views, showing good technique, of *Harbour, Scarborough*.

Class VII (open to members), Lantern Slides in sets of six.—A set of beautiful "swan" studies, by Mr. C. M. Wane, gains the silver medal, while the bronze goes to Mr. George Clelland for a set (varied subjects) showing good technique.

Class VIII. (open to amateur members only), Landscape, Seascape, and Architecture, up to and including half-plate.—Silver medal is awarded to Mr. W. E. Carnegie Dickson, *A Highland Loch*, a well-composed picture, but printed in a rather disquieting shade of green. Mr. W. J. Croall is awarded the bronze medal for *Harvest—A Windy Day*, a simple little scene, brimful of life and motion.

Class IX. (open to amateur members only), Figure or *Genre*, including Animals, up to and including half-plate.—The silver medal is gained by a costume piece by Mr. H. Stewart Wallace, entitled *A Game at Chess—Will She Mate Him?* The arrangement on the whole is satisfactory, but there is a stiffness of pose about the figures that mars the effect. Mr. Alex. Allan wins the bronze medal with *Words of Comfort*, one of his "auld wifey" studies, with which he has been so successful.

Messrs. G. W. Johnstone, R.S.A., Edinburgh, Percy Lund, Bradford, and John Stuart, Glasgow, were the Judges.

On the Saturday evenings during the Exhibition, entertainments will be given. These include a lantern lecture, entitled "Rambles with a Camera," by Mr. James Patrick, the gold medalist.

The following is the complete prize-list:—

Class I. (open to all), Landscape, Seascape, and Architecture.—Gold medal, Mr. James Patrick, Edinburgh, No. 30, *The Miry Beasts Retreating frae the Plough*; silver medal, Mr. Archibald Cochrane, Hurlet, No. 27, *Spring Pastoral*; bronze medal, Mr. Alexander Allan, Edinburgh, No. 39, *Landscape*.

Class II. (open to all), Portraiture, Figure, and Animal Studies.—Gold medal, Mr. W. Smedley Aston, Birmingham, No. 65, *Mrs. Arthur Gaskin*; silver medal, Mr. R. S. Webster, No. 60, *At Home*; bronze medal, Mr. William Reid, Wishaw, No. 59, *Horses in a Harvest Field*; certificate, Mr. James Auld, Edinburgh, No. 75, *In the Olden Times*.

Class III. (open to members), Landscape, Seascape, and Architecture.—Silver medal, Mr. James Burns, No. 119, *'Tis Winter Fairly*; bronze medal, Mr. George Clelland, No. 127, *Barnclinth*; certificate, Mr. Harry P. Wane, No. 105, *The Old Bridge*; certificate, Mr. E. L. Brown, No. 131, *Baptistry*.

Class IV. (open to members), Figure or *Genre*, including Animals.—Silver medal, Mr. James Burns, No. 146, *The Wind Bloweth from the*

Sea; bronze medal, Miss Eleanor M. Grey, No. 156, *Mason Hunter*, R.S.W.; certificate, Mr. W. J. Croall, No. 141, *Steady*; certificate, Mr. Douglas H. Watson, No. 147, *Portrait*.

Class V. (open to members), Still Life, including Fruit and Flowers.—No awards.

Class IX. (open to amateur members only), Figure or *Genre*, including Animal Studies, up to and including half-plate.—Silver medal, Mr. H. Stewart Wallace, No. 174, *A Game at Chess—Will She Mate Him?*; bronze medal, Mr. Alexander Allan, No. 189, *Words of Comfort*; certificate, Mr. E. L. Brown, No. 170, *Bubbles*.

Class VIII. (open to amateur members only), Landscape, Seacape, and Architecture, up to and including half-plate.—Silver medal, Mr. W. E. Carnegie Dickson, No. 205, *A Highland Loch*; bronze medal, Mr. W. J. Croall, No. 242, *Harvest—A Windy Day*; certificate, Miss M. G. Johnstone, No. 206, *The Clyde at Greenock*; certificate, Mr. James Burns, No. 208, *O'er Hill and Dale the Shadows Creep*.

Class VI. (open to members only), Set of pictures, not exceeding three, being work done by camera held in hand.—Silver medal, Mr. J. C. McKechnie, No. 259, seascapes; bronze medal, Mr. J. Yate Thompson, No. 255, *Harbour, Scarborough*; certificate, Mr. W. J. Croall, No. 256, various; certificate, Mr. A. J. Cameron, No. 257, landscapes.

Class VII. (open to members), Lantern Slides, in sets of six.—Silver medal, Mr. Charles M. Wane, No. 284, *Swans*; bronze medal, Mr. George Clelland, No. 269; certificate, Mr. George Clelland, No. 270; certificate, Mr. W. J. Croall, No. 266.

President's Gold Medal for the Best Picture in the Exhibition, the work of an Amateur Member.—Mr. James Burns, No. 146, *The Wind Bloweth from the Sea*.

Our Editorial Table.

CATALOGUE RECEIVED.

C. P. Goerz, 4 and 5, Holborn-circus, London, E.

THE production of this catalogue reflects very high credit indeed upon Mr. Goerz. Bound in a light green cover, with a graceful design in blue and gold, it instantly secures attention and pleases the eye. And between the covers there is something more than a mere trade list. The section devoted to lenses gives the photographer much information, not only about the principles of construction adopted in the Goerz lens, but also many optical hints, which will assist him in his work. Here, for instance, is a recommendation as to focal length, of which, for the sake of pleasing perspective in photography, we would make it a criminal offence in a photographer to be in ignorance.

"It has been generally recommended that the focus of the lens for any particular size of photograph should be the length of the longest side of the plate, e. g., a 5-in. lens for a 5 x 4 plate, a 6½-in. lens for a half-plate, and an 8½-in. lens for a whole-plate, &c. The better rule, however, is to select a focus equal to the diagonal of the plate, the perspective given by such a lens being much more natural, i. e., more closely approximating to the human eye."

The many beautiful half-tone and collotypic reproductions in the book do the Goerz lenses full justice. Remaining sections of the book are devoted to prisms and screens, the Goerz-Anschütz folding camera, the powers of which are well illustrated by studies of German cavalry in rapid motion; the Goerz photo-stereo binocular (noticed in our pages a few months ago), &c., &c. Finally, there is a detailed account of how a Goerz lens is made. With reference to Series III. of the lens, Mr. Goerz writes us: "I take this opportunity to inform you that new calculations having been made at my factory, it has been found possible to construct all the Double Anastigmats, Series III., up to the No. 6, with a working aperture of f-6·8, with which aperture they are now supplied, instead of f-7·7 as formerly; the prices, however, are unaltered."

Altogether this is a catalogue which, in its own sphere, almost assumes the position of a work of art. In the history of modern optics nothing has been so remarkable as the growth in favour of the Goerz Double Anastigmats. Their high optical qualities are very widely acknowledged.

THE USEFUL ARTS AND HANDICRAFTS SERIES.

Published by Dawbarn & Ward, 6, Farringdon-avenue, E.C. Price 6d. each.

THIRTEEN numbers of this valuable series of little books have now been published, and although there is nothing of a strictly photographic character included, those interested in the minor arts and crafts constitute a wide public, amongst which, doubtless, many of our readers are to be found. We can cordially recommend the series to the notice of those who practise the self-culture of some particular form of craftsmanship. Plainly and clearly written, the books could not be excelled as simple guides to the subjects mentioned in the following list:—

Design and Drawing. C. G. Leland. Wood-carving. C. G. Leland. Picture Frames; making and decorating. C. G. Leland and Thos. Bolas. Dyes, Stains, Inks, Lacquers, Varnishes, and Polishes. Thos. Bolas. Decorated Wood-work; by carving, colouring, and wire-in-laying. C. G. Leland and C. E. Dawson. Gouge-work and Indented Wood-work.

C. G. Leland and Rev. F. C. Lambert. Wood-engraving and Placard Cutting. C. G. Leland and Thos. Bolas. Bent Iron Work. Geo. Day, F.R.M.S., and C. G. Leland. Pyrography, or Poker-work. On Wood, fabrics, &c. Thos. Bolas and C. G. Leland. Stained and Leaded Glass. W. T. Whitehead. Artificial Wood; and shavings in decoration. C. G. Leland. Venetian Marquetry and Inlaying. C. G. Leland. Church Decoration (permanent). W. T. Whitehead.

THE "VANGUARD" STAIN REMOVER.

Manufactured by the Vanguard Manufacturing Company, Maidenhead.

In order to test the value of this stain remover we selected for experiment one of our own negatives which we developed with pyro-ammonia, without sulphite, over fifteen years ago. The negative was of a fairly deep yellow colour. Immersion in the Vanguard stain remover (which is a clear colourless solution) diluted in the proportion of one to eight, took away the yellow colour in a few minutes. There could be no better testimony of its efficacy. The Company inform us that at the dilution mentioned the solution may be used to clean engravings, by simple immersion, and that in its concentrated form it removes stains from the hands. Moreover, it does not contain any poison scheduled in the Act; and when the cleared negative is washed the stain does not reappear. Taking these properties for granted we are satisfied to find by actual trial that as a remover of stains from negatives the Vanguard Company's latest introduction fulfils its purpose perfectly.

From the Photochrom Company, 121, Cheapside, E.C., we have received a frame of three views in Florida. It need scarcely be remarked that the pictures are in colours by the process which has of recent years made the world familiar with innumerable beautiful "photographs in the colours of nature." It is interesting to speculate whether pigmentary natural colour-photography, if discovered, would yield more attractive results than the charming examples of photo-mechanical work that are before us. Probably not. By the way, we learn that the business of the Photochrom Company has grown to such an extent that all the frames required for the enormous number of pictures sent out are made by the Company's own staff. These amount to some hundreds of thousands in the course of the year.

Studio Gossip.

THE Star Photographic Company, 536, Oxford-street, announce that they will take the photographs of any of the volunteers for the Transvaal War entirely free of charge, provided they will attend their studios in khaki uniform and at any time before 9.30 p.m.

A WELL-KNOWN photographer has converted into practical shape his sympathy with the gallant fellows who have volunteered to fight in South Africa. Mr. Marshal Wane, of 82, George-street, Edinburgh, announces that he is prepared to photograph free any volunteers (officers and men) under orders for the front, and to supply each with two cabinets.

WITH reference to the recent articles and correspondence in our pages relative to the articling of pupils, a provincial friend writes us that in the town in which he resides there are two photographers making between 2000L and 3000L a year, two between 600L and 1000L, and many about 300L. Our friend says he knows of twelve apprentices who have been taken during the last few months at premiums varying from 30L to 105L.

CRYSTOLEUM WORK.—In reference to a query from a correspondent in last week's JOURNAL on this subject, the following ladies and gentlemen have written to say that they undertake this kind of work: Miss Robotham, 30, St. Luke's-road, Clapham, S.W.; Mrs. Cooper, 21, Station-street, Walsall; Mr. G. H. Drake, Mackenzie Studio, Slough, Bucks; Miss Wolfe, Hydes Farm, Forest Side, Waltham Abbey, Essex; Mr. E. Goodfellow, 47, High-street, Wincanton; Mr. Alfred Underhill, 32, Clarendon-road, Croydon; Miss Cox, The Elms, Stow-on-the-Wold, Gloucestershire; and Mr. E. Knott, The Gainsborough Studio, Kingston-road, South Wimbledon.

AT the North London Police-court, on February 7, Mr. Thompson Fisher, a photographer, of Mare-street, Hackney, appeared to answer adjourned summonses taken out at the instance of the London County Council, (1) for erecting a structure beyond the general building line, and (2) for erecting a structure without the consent in writing of the London County Council. Mr. Chilvers appeared for the Council, and Mr. C. V. Young represented the defendant. In this case the defendant had erected a show-case in the forecourt of his house, and the Council, contending that this was a building, took these proceedings. In giving judgment, Mr. Fordham said that on the cases cited he was bound to hold that the show-case was a structure within the meaning of the London Building Act. He had adjourned the summons from January 17, in the hope that some arrangement would be come to between the defendant and the Council, because the show-case was an obstruction to nobody and impeded nobody's light but the defendant's. He had to hold that this was a structure; but, as it had been erected on land where a similar structure had stood previously, it was reasonable for the defendant to think that he was in the right. As this old structure was erected without officia-

sanction, it was not legally there, and the erection that followed was not legal. Still he (the magistrate) could not see why the Council pursued the defendant. Mr. Chilvers: Mr. Young has asked the Council to allow the show-case to remain, and the Council has granted a licence for twelve months. Mr. Young: I accept that as an instalment. Mr. Fordham: I must convict in the face of decided cases, but shall only inflict a penalty of 5s., with 2s. costs on each summons.

News and Notes.

PROFESSOR RÖNTGEN, who has accepted the call to the University of Munich, has been appointed Director of the State Institute of Physics and Metrology.

PHOTOGRAPHIC CLUB.—February 21, at eight o'clock, exhibition of prints and slides of "The Belgian Photographic Excursion, 1899," arranged by Messrs. W. D. Welford and W. F. Slater.

WE are asked by the Hon. Secretary of the South London Photographic Society to remind our readers that February 17 is the date for entry forms to be received for the coming Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.—Tuesday, February 20, at eight p.m., Professor R. W. Wood will read a paper on "The Diffraction Process of Colour Photography," or other subject. The exhibition of photographs by Mr. Craig Annan will remain open from ten to four to the end of the month.

THE Annual Dinner of the South London Photographic Society was held on Saturday last with its usual success. Owing to the heavy fall of snow, many visitors were unable to travel. The photographic press and senior societies were, however, well represented, and, notwithstanding outside discomforts, all within went merrily.

HAND CAMERAS.—Mr. J. Kennerell, of 7, York-road, Wisbech, writes: "The paper read by Claud Rippon, M.A., before the Oxford Camera Club, on the 9th instant, on 'Hand-camera Work,' interested me very much indeed; but there is one thing, and, I think, most important, he did not say how he proposed to change the plates. If you can by any means bring this before him, it might induce him to give him another paper on the subject, if he would be so kind."

THE Hackney Photographic Society, in lieu of an annual dinner, which has been held by the Society for many years, decided this year to make a change, and arranged a *soirée* and dance at the North-East London Institute on Thursday last, February 15. The nature of the entertainment was sociable; pictures, albums, microscopes, stereoscopes, &c., were on show, and a variety of vocal and instrumental music commenced the evening, followed by a dance, for which an efficient band had been engaged. Messrs. Newell & Co. provided refreshments.

THE Fifteenth Annual Exhibition of the Birmingham Photographic Society will be held at the Royal Society of Artists, New-street, on February 26, 27, and 28, and March 1, 2, and 3. In addition to the competitive pictures, in the Open and Members' Sections there will be a loan collection of photographs by some of the most eminent British workers, specially organized for this Exhibition, vocal and instrumental music, kinematograph and lantern entertainments, the kromskop, the lantern microscope, mutoscopes, cohesion figures, and projection of solid bodies on the screen, &c. There will also be a display of the latest novelties in apparatus.

A CONTEMPORARY remarks that "a memoir has been recently presented to the Paris Academy of Sciences, by M. Frillat, which is of interest to students of the science of photography. It refers to the transformation of the photographic image of a negative into the lamellar state by exposing it to the vapours of nitric acid, which dissolve the precipitated silver, and cause the disappearance of the image. The silver is reprecipitated by exposing the plate in an atmosphere of moist sulphuretted hydrogen, when the image reappears in colours, not necessarily the true colours of the objects, although, it seems, there is some possibility of exercising a little control."

Commercial Intelligence.

THE metric system of weights and measures is allowed to be used in Russia now with the system at present in use.

THE Process and Engineering Company have removed to 66, Deptford-green, London, S.E. At the new premises they will have so much more space (about 18,000 square feet) and new machinery at their disposal, that they will have greater facilities for the execution of orders.

"PRICE-CUTTING."—Last week, at a representative meeting of grocers, held under the auspices of the Grocers' and Allied Trades' Proprietary Articles Association, at the Holborn Town Hall, a resolution was passed in favour of joint action with the Chemists' Association to obtain a uniform rate of charge for all proprietary articles from the manufacturers, with a view to stopping the cutting of prices.

MR. J. H. STEWARD, of 406, Strand, is exhibiting a photograph of a portion of a consignment of powerful telescopes on stands he has supplied from stock, finished and delivered at Woolwich within four days of receipt of order. They magnify from fifty to ninety diameters, and have object-glasses, in the majority of instances, of two and a half inches to three and a quarter inches

diameter to ensure good field of view and clearness. Mr. Steward also made and supplied, within fourteen days, 500 binoculars to the Yeomanry, 100 of them being for the Bucks companies.

Re EDWIN WESLEY ROBERTS, photographer, Royal-arcade and St. Mary-street, Cardiff.—The statutory meeting of the creditors interested under this failure was held at the offices of the Official Receiver on Friday last, under the presidency of the Assistant Official Receiver for the Cardiff district. The statement of affairs filed by the debtor disclosed gross liabilities amounting to £312l. 5s. 7d., of which £190l. 5s. 8d. was due to unsecured creditors. The debtor alleged his failure to have been caused through want of capital and pressure by creditors, with consequent heavy costs. Mr. Lewis Morgan, on behalf of the debtor, submitted an offer to the meeting of 6s. in the £, but the Official Receiver said he was of opinion that the debtor's stock would realise more than sufficient to pay 7s. 6d. in the £. One of the creditors ventured the opinion that the assets, as estimated by the debtor, showed something like 12s. in the £, and yet he expected them to accept 6s. in the £. Eventually it was decided to adjudicate the debtor bankrupt, and Mr. C. E. Dovey, chartered accountant, of Cardiff, was appointed trustee of the estate and property of the bankrupt, under the supervision of a Committee of Inspection, which was also appointed.

THE Managing Director of the Yost Typewriter Company writes us: "The bad taste and bitterness of feeling displayed by the yellow press of France in connexion with our military operations in South Africa has naturally and rightly caused much resentment throughout the Queen's dominions. Since the old axiom that "in order to hit a man you should try and go straight for his pocket" has been translated by many people into the desire and resolve to establish a partial Exhibition boycott by inducing British traders to withhold from exhibiting at, and the British public from frequenting, the forthcoming world's show at Paris, a timely warning will not be out of place. Those people who merely visit exhibitions for pleasure sake can, of course, please themselves as to whether they ought to go or stop away, and if, in their view, they are punishing the Frenchman by holding aloof, they may be right in giving practical expression to their righteous indignation. But it is quite different with the British trader. He would be wrong in letting his feelings overcome his better judgment. The American, the German, and the Belgian manufacturer would only be too pleased if Great Britain were not properly represented at the Paris Exhibition, since it would give him an opportunity of alleging a superiority of his goods which does not exist, and, under certain conditions, such a contention could not be repudiated on the spot, owing to the lack of enterprise of representative British exhibitors. Space will not permit me to enlarge as fully upon this subject as I would like, but sufficient indication has been given to the trading community of this country to be careful, and not to forget to provide new trade outlets for the future by making as brave an effort as possible at the Exhibition (although it may go against the grain), to let the world see that, in spite of the frontal and flank attacks, the British and colonial trader is as anxious as the British soldier to uphold the supremacy of the Empire in the eyes of the whole world."

ROYALTY AND ELECTRICAL INKLESS PRINTING.—Recently the Electrical Inkless Printing Syndicate have been engaged in the production, by their improved process, of a quarto booklet on *Interesting Dovercourt*, describing the illuminated window recently presented to the parish church by the German Emperor in memory of German soldiers buried there, and the lych-gate presented by Her Majesty the Queen, both of which are illustrated by fine copper half-tone prints. The text, old style, with wide margins, is printed on both sides of the paper, perfected; the impression, in a dense black, is solid, sharp, and clear, and there is not the slightest sign of any chemical reaction either in the paper or in the print. To the ordinary printer it might be a good 2s. black the work was done with, and few printers could tell the difference; but it is in the half-tones that the greatest success is achieved. These are printed on highly finished coated paper, and are veritable photographic presentations, bright, brilliant, sharp, and clear in every detail, and of the right photographic tone. An expert printer, who is also a photographer, on being shown one of the first proofs, remarked, at first sight, that it was a photograph, and was immensely surprised when a closer examination showed him the screen lines of the half-tone process, and he was told it was printed by electricity on a letterpress machine. Copies of this booklet have been presented to Her Majesty the Queen and to His Royal Highness the Prince of Wales, with an explanation that they were the first copies of any publication executed by electricity without printing ink. Her Majesty and the Prince expressed their interest in the new process of printing, and pleasure at the results as presented to them. A copy has also been presented to the German Emperor. An edition for the press and the trade is in preparation, when the immense progress that has been made with electrical printing will be seen and its prospects as the printing of the future more fully estimated.

Patent News.

THE following applications for Patents were made between January 29 and February 3, 1900:

FILM-CHANGING.—No. 1872. "Improvements in Means for Loading and Exposing Films in Cameras." W. F. STANLEY.

CAMERAS.—No. 2076. "Improvements in Cameras." Communicated by O. H. Peck. Complete specification. O. IMRAY.

CINEMATOGRAPHY.—No. 2132. "Improvements in Kinematographs, or Means for Displaying a Series of Pictures." L. E. GRANICHSTAEDTEN.

CINEMATOGRAPHY.—No. 2133. "Improvements in Kinematographs." L. E. GRANICHSTAEDTEN.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
19.....	Bradford Photo. Society	<i>An Alpine Borderland.</i> J. W. Wade.
19.....	Camera Club.....	{ <i>With Rifle and Camera in East Africa.</i> E. N. Buxton, M.A., D.L., M.P.
19.....	Cripplegate Photo. Society	{ <i>Outdoor Photography.</i> A. Horsley Hinton.
19.....	Ealing	{ <i>Pictorial Photography.</i> John H. Gear, F.R.P.S.
19.....	Glasgow and West of Scotland	{ <i>Photographic Optics and Description of the Cooke Lens.</i> Mr. Taylor.
19.....	Kingston-on-Thames	{ <i>From Athens to Olympus.</i> A. Vandendriesche.
19.....	Southampton	<i>Flashlight Work.</i> H. Emery.
19.....	Stafford Photo. Society.....	<i>How a Lens is Made.</i> Reader, H. Cliff.
20.....	Brixton and Clapham	<i>Colour Photography.</i> E. J. Wall, F.R.P.S.
20.....	Gospel Oak	{ <i>Demonstration: Rollable Films.</i> W. J. Ramsey.
20.....	Hackney	Members' Annual Sale.
20.....	Redhill and District	{ <i>Demonstration: Printing-in Clouds.</i> T. Percival Padwick.
21.....	Ashton-under-Lyne.....	Special Meeting of Members.
21.....	Borough Polytechnic	<i>Practical Photography in the Field.</i>
21.....	Croydon Camera Club	{ <i>The Snapshot Up-to-Date.</i> John H. Gear, F.R.P.S.
21.....	Photographic Club	{ <i>Exhibition of Prints and Slides of the Belgium Photographic Excursion, 1899,</i> arranged by W. D. Welford and W. F. Slater.
21.....	Southsea	<i>Exhibition of Prize Lantern Slides.</i>
21.....	Woodford	{ <i>Some Practical Hints for Photographers in Pictorial Composition.</i> J. T. Ashby.
22.....	Camera Club	{ <i>Arrangement and Construction of Picture Landscape.</i> Arthur Burchett.
22.....	Darwen	Social Evening.
22.....	Derby	{ <i>Pictorial Photography.</i> A. Horsley Hinton.
22.....	Liverpool Amateur.....	<i>English Cathedrals.</i> William Harvey.
22.....	London and Provincial	<i>Open Night.</i>
22.....	Oldham	<i>Portraiture.</i> Reader, C. H. Barlow.
23.....	Borough Polytechnic	{ <i>Practical Evening: Tones on Bromide Papers.</i>
23.....	Bristol and West of England	<i>Somersetshire Churches.</i> F. Bligh Bond.
23.....	Croydon Microscopical	<i>Conversational Meeting.</i>
23.....	Southport	{ <i>Demonstration: Secco Films.</i> Representative of the Company.
24.....	Birmingham Photo. Society ...	{ <i>Fifteenth Annual Exhibition.</i> Private View and Conversazione.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 8.—Mr. T. E. Freshwater in the chair.

Mr. A. J. BROWN showed some tests confirming his statement that a white backing had the effect of reducing the exposure required to produce a given result as compared with an unbacked plate, or one backed with, say, caramel. As suggested by Mr. Fry, he had exposed upon a subject of an equal tint, having no pattern, the better to determine the truth of the matter and to make the difference more apparent.

Mr. T. E. FRESHWATER showed a number of slides copied from the sketches sent home by the artist correspondents in South Africa, the subjects, of course, being all connected with the present war.

Mr. LEWIS MEDLAND showed on the screen some reminiscences of his residence in the Transvaal in 1874. There was his claim on the Lydenburg gold-fields, his licence in English and Dutch, views of the digging and washing-out of the alluvial gold, Kimberley and its diamond-fields, Zulus, &c. He also showed slides of some further additions to his series of animal studies, penguins, apes, skunks, ostriches, black leopard, and a boa-constrictor or two.

Other miscellaneous slides concluded the business of the meeting.

PHOTOGRAPHIC CLUB.

FEBRUARY 7.—Mr. H. Vivian Hyde in the chair.

Mr. KLOSSZ gave an interesting lecture on a trip along the western fjords of Norway, accompanied by slides from his own negatives, which drew forth their due meed of praise. The visit was made in 1897, after one in 1896, which served the purpose of bringing the lecturer to resolve upon another and extended tour. The start was made from Newcastle on the *Ragnvald Jarl*. Bergen was reached in due course, and a few slides were introduced to show the wide streets, the fish industry, and the important part played by the women of the country in the fields, the boats and markets. Excursions were made to various places—Fantoft Church, &c. Many of these churches were over 700 years old, but still preserve a very durable appearance and the quaint design of the period. Hardanger Fjord, Odde, Laatfoss, Sojne Fjord, Naerodal, Gudvangen, Merok, the Romsdalhorn, Molde, Trondhjem, Christiansund, &c., were in turn visited, and many pictures of the beautiful scenery, noted for its grandeur throughout Europe, were shown. Mr. Klossz made good use of his opportunities in the land of the midnight sun, and was enabled to engage the best attention of his audience throughout the lecture.

Bath Photographic Society.—February 7.—Mr. AUSTIN J. KING gave

SOME CAMERA NOTES ON ITALY.

The lecture was illustrated with lantern slides from Mr. King's own negatives, wherein the more interesting points received due attention. At the con-

clusion the CHAIRMAN and Mr. G. F. POWELL thanked the lecturer for his able paper and illustrations, Mr. Powell remarking that theirs was the third or fourth meeting Mr. King had assisted at that day. The members felt very grateful to him. Mr. GREEN had visited some of the places referred to by the lecturer, and held similar views to those already expressed. He considered St. Peter's to be the finest specimen of architecture in the world, without a single exception. The SECRETARY (Mr. W. Middleton Ashman) drew attention to an improved system of packing plates for amateurs' use, and announced demonstrations shortly on Dekko, Gravura, and other papers.

Liverpool Amateur Photographic Association.—At the last weekly meeting, Dr. J. W. ELLIS lectured on his trip to Belgium. Starting from Antwerp, the lecturer described Malines, Brussels, the field of Waterloo, Oudenarde, Courtray, Ypres, Ghent, Bruges, and Blankenberghe. While on the subject of Waterloo, Dr. Ellis gave a minute description of the disposition of the opposing forces, the château of Hougoumont, as well as other historical places of interest. The lantern slides, which were of a most excellent quality and made by the lecturer, comprised very interesting examples of architecture, notably the hôtels-de-ville of the various towns, the Cloth Hall at Ypres, and the beautiful belfry at Bruges.

Redhill and District Camera Club.—February 6.—Mr. J. O. GRANT gave a lecture on

ANIMAL PHOTOGRAPHY.

The President (Mr. William Brooks) was in the chair, and there was an appreciative audience. The lecturer claimed for animal photography a wider interest than ordinary landscape work. Photographs that were mere mementos of a summer holiday had but little interest for any but those who took them, while, on the other hand, every one was pleased to see a good set of animal studies. He believed that many people did not take up this branch of photography, because they thought it an extremely difficult one. This was not the case really; indeed, it was much easier to produce a presentable animal study than an interesting landscape; but, to be successful, two important items were required, namely, a large amount of patience and perseverance, and a real love for animals. Mr. Grant then related some of the difficulties he had met with and overcome when photographing wild animals in captivity, and brought his interesting lecture to a close with a lantern exhibition of animal photographs taken at the Zoo. Many of these were very fine, and gained the hearty applause of his audience.

FORTHCOMING EXHIBITIONS.

1900.

February 16-24	Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.
,, 24-March 3	Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley.
March 3-10	South London Photographic Society. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh Hill, Blackheath, S.E.
,, 13, 14	G.E.R. Mechanics Institution (Photographic Section). C. W. Harris, 294, Cam. Hall-road, Leytonstone, E.
,, 26	Twentieth Century International, Birmingham. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.
,, 26-31	Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin.
April 3-7	Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

NEGATIVES BY POST.

To the Editors.

GENTLEMEN,—Lest others may be treated to the same course of action, may I state a case that has just occurred? A few weeks back a photographer in Leicester sent me on a small parcel by parcel post consisting of three negatives and three prints. The prints were supposed to be put in the tube. The three negatives arrived safely with the tube tied on to the box (cardboard) containing the negatives. The box was not even damaged at its corners, the string was not broken round the box or round the tube, the tube is perfect at its ends, which, I fancy, speaks well for the handling of the packet. But on arrival I tore off the outside paper of the tube and found no prints wrapped round it, so pulled off the paper from

ends of tube to look through it. I found no prints. I then wrote to the Leicester gentleman, and he coolly informed me that it was my duty to make inquiries at the post-office, as the lost articles were my property. I then ascertained at the Hammersmith sorting office that a postal form was procurable, but was to be filled in by the sender. Can any gentleman recommend me the best course to take? I have the tube and box by me. I ought to say that I had to forward the cash beforehand.—I am yours, &c.,

F. G. WILLATT.

101A, Fulham Palace-road, London, W., February 8, 1900.

SULPHIDE TONING.

To the Editors.

GENTLEMEN,—The method of toning with "liver of sulphur," mentioned by "Othello" in the JOURNAL of February 2, is practically the same as that given by Abney (with ammonium sulphide), the latter being less tedious; but my experience with it some thirteen or fourteen years ago was that it was very uncertain, and the tones obtained variable.—I am, yours, &c.,

F. S. WELLS.

Southgate, N., February 2, 1900.

A CORRECTION.

To the Editors.

GENTLEMEN,—In your report, in the number of the JOURNAL for Feb. 2, of Mr. Webster's lecture on Röntgen rays, at the Camera Club, you state that the "President of the Röntgen Society" entered into the discussion at its close. I made no remarks, as I was not present, being detained elsewhere by another engagement.—I am, yours, &c. WILSON NOBLE.

Tangley Park, Guildford, February 8, 1900.

THE CAMERA IN THE CAMP.

To the Editors.

GENTLEMEN,—I have been a good deal amused by the paper, or lecture, on "The Camera in the Camp" by Mr. Maclean, in your last issue.

Has it occurred to the writer that such information as he recommends could only be procured at a time of profound peace, and that it would require constant revision? Even then it would not give the changes which are inseparable from war, and the formation of entrenchments, breaking up of roads, destruction wholly or in part of houses, &c. Nor in any case could it give information as to what positions had been occupied by an enemy, or in what force they were held and what reinforcements would be available. It is ignorance of these points mainly which has been felt.

Moreover, it is one of the main essentials to success in war that plans should not be known before the time comes to carry them out, and, even if all the information required for all possible routes were available, not only would time be necessary to hunt up the needful detail, but it would be necessary to take into confidence many more people than now.

I need hardly say that such photographs as are proposed would never be available of any but our own country, where they would be least wanted. But, if Mr. Maclean still thinks that he could work the oracle, I would advise him to take his camera out to South Africa and try the experiment he suggests; he would soon find out that even the general in command cannot ensure the carrying out of an exact order of advance, still less that of one of retreat; and that the officer in immediate command of the troops would be too busy watching what was happening to hunt for the proper photograph for his want, even if he had at hand what was needed.

If Mr. Maclean cannot go to South Africa (and many things may render that impossible), I would suggest that he make complete sets of photographs of the country in which he resides, or even of a large town, showing all the possible routes, and so arrange and index them that any one shall be available at any moment. He will then have some notion of the task he wishes to place on the shoulders of that well-burthened body, the Royal Engineers. Doubtless he meant to pay them a compliment in suggesting for half a dozen of them so great a labour.

I have said nothing about the lectures on topography, &c., because it is manifestly impossible that they should be given after the route is selected, and to expect that men such as we see about us should carry in their heads a complete knowledge of the topography of a country from hearing a few lectures on it is too absurd.

Believe me that, to a properly instructed officer, a route survey and report is infinitely more informing than a photograph would be, or a series of such. No doubt, photographs of special objects, as well as sketches, aid; but the latter allow of the emphasising of objects to which it is desired to direct attention, while the former have the disadvantage that they do not truly represent the contrasts of colour, so that objects which are really relieved against each other are not so in the same degree in the photograph, &c.

As you know, I am an old photographer (it is more than forty years since I first took to the art), and am certainly not disposed to undervalue its utility; but I am disgusted when I see men, who know nothing of the practical business of my old profession, hurry to assume that their crude,

undigested hints are to be taken up and worked out by others who have their own duties to attend to.

Excuse the length of this letter; it would have been much shorter to ridicule Mr. Maclean than to attempt to show where he was wrong, and I fear that I have only imperfectly succeeded now.—I am, yours, &c.,

J. F. T.

ARTICLING PUPILS IN PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Referring to the above question, does it not occur to you that the whole gist of the matter lies in a nutshell? for the simple fact is this, whilst amateurs are given the opportunities they have through the dealers, the professional cannot possibly expect pupils as in years gone by. Now every man, woman, and even child that can afford it, has a camera of some sort, that with a shilling manual helps to carry out the familiar saying, "A little knowledge is a dangerous thing." Every present-day photographer can vouch for one thing, whenever a parent or guardian has asked him to negotiate for the articling of a youth in question, invariably the remark is, "He already photographs very nicely and has taken some of the best likenesses various friends have ever had." Now, this sounds very clever, but it is without exception most objectionable to an experienced man whose years of study and work seem to count as nought if all is as easy as our friends the amateurs make it out to be.

The dealers have undoubtedly done a great injury to the profession, and that sooner or later, every one will acknowledge (take, for instance, the view trade alone).

It should be borne in mind that what the amateur undertakes is for amusement, and satisfies friends easily, for it is not a question of £ s. d. The professional, on the contrary, receives the most exacting criticism in return for having to charge for his skill, labour, &c. To become a practical photographer takes years of study and experience, as we well know, but this fact does not impress itself upon the amateur with his 1s. or 2s. book. It has become a serious matter. Photographers who years ago would receive 100 guineas, and even more, with a pupil, did teach them not only the art of taking photographs, pictures, &c., but turned them out good, clever, business men as well. Now all is altered. Things have been allowed to slide too long, and the amateurs have it all in their own hands; therefore guardians and parents are under the impression there is but little to learn, and offer only a small premium accordingly. I am sure many of your readers will endorse my feelings. In conclusion, let me suggest that, if cameras (as well as bicycles and cats) were taxed, the Inland Revenue would reap a grand return. Thanking you in anticipation for inserting this tirade,—I am, yours, &c., FAIR PLAY.

PHOTOGRAPHY IN WARFARE.

To the Editors.

GENTLEMEN,—The following extract from an evening paper, published very recently, may both interest and amuse:—"The Rome correspondent of the *Daily Chronicle* states that an officer of the Italian army has invented a system of telegraphy (*sic*) at a distance. By his method photographs can be taken at distances as great as eighteen kilometres (ten to eleven miles). This discovery is expected to prove of great military importance." Further particulars will, doubtless, be welcomed. In view of what has been stated in your pages recently on the subject of tele-photography and warfare, I am sure the paragraph I have quoted will be duly appreciated.—I am, yours, &c.,

J. A. REID.

Cutcliffe-grove, Bedford, February 9, 1900.

[Tele-photography has long been employed in the Italian army. The *Chronicle* correspondent is obviously unfamiliar with his subject.—EDS.]

METRIC MEASURES.

To the Editors.

GENTLEMEN,—My letter, in yours of the 9th inst., appears to have got somewhat mixed towards its conclusion. Of course this could be no fault of mine, although I found one of the sheets of copy a long way from London. I now enclose the last sentence, with the missing matter added.

"So much for measurements; but how about weights, which more nearly concern the photographer? I have opened the ALMANAC at random at page 1034, and read, 70 grains in 20 ounces. Although a fair hand at figures, the above conveys no sense of proportion to my mind; and I hardly think that 'Free Lance' could tell one, without pen and paper, the proportion which the ingredient (hydroquinone) bears to the whole. A glance at the formula, as given in metric measures, shows that it is 8 grammes (or parts) per 1000. The same is equally applicable to the other ingredients."

There is an impression that the metric system requires learning; but, really, there is practically nothing to learn. Certainly the array of jaw-breaking names given in most English text-books looks rather alarming. A great number of these names are never used on the Continent, as they have been 'ound' quite unnecessary.—I am, yours, &c.,

CHAS. LOUIS HEIT.

Brigg, England, February 10, 1900.

Re PARKIN AND FRY.

To the Editors.

GENTLEMEN.—I have read with some surprise your account of the Bankruptcy proceedings. This is evidently copied from a Liverpool paper, who on the following day inserted a letter from me, which showed that, practically, the whole of the statements made were either false or misleading. You should take more care in saying that certain things occurred in Court, which, in this instance, are entirely at variance with facts. As an instance, by referring to the records you will find that what the Registrar said was: "as far as he was concerned, he was satisfied that the paper could be made by me." Bromide, and other paper, is now being made by me, and is being used in the enlarging business now carried on by my father at the above address, the reason being that the proper machinery is now provided to make it. You can have some samples of the paper if you desire.—I am, yours, &c., FREDERICK GEORGE FRY.
31 & 33, Sandstone-road, Old Swan, Liverpool, February 12, 1900.

[The report to which Mr. Fry refers was supplied to us by a News Agency. We shall be pleased to have samples of the paper referred to.—Eds.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

W. Hughes, Mostyn Arms Hotel, Llandudno.—Photograph of Llandudno Yeomanry. J. Ingham, Winton House, Ashton-upon-Mersey.—Photograph entitled "Shall I be of any use, father?"

A. J. Ashbolt, 29, High-street, Southampton.—Two photographs of A. Millward. Photograph of A. Chadwick.

J. W. D.—We know of no such book.

R. W. B.—Such goods, we believe, are obtainable of Messrs. Fallowfield, 146, Charing Cross-road, W.C.

A. BUTCHER.—Messrs. Marion & Co. supply a solution for the purpose (King's Solution), which you might try.

STUDIO.—Generally speaking, the three types of instrument, A, B, and C, may be bracketed equal for your purposes.

FLASHLIGHT.—Messrs. Fuerst Bros., of 17, Philpot-lane, E.C., supply a powder which might answer your purpose.

CONSTANT READER.—We recommend you a little book on the process by Mr. W. J. Warren. It is published by Messrs. Iliffe, St. Bride-street, E.C.

CONDENSER.—As we understand your question, if you alter the position of the condenser so that its focus comes at the position of the stop, the colour will disappear.

J.—If you are a weekly servant, a week's notice is all that you can claim. The notice you refer to in, our opinion, was legal. We regret it is against our rules to answer questions through the post.

SCRATCHED DAGUERREOTYPE.—SMEAR says: "I have a Daguerreotype which has been sent to be framed. It has been wiped over, which has caused a smear. Can the scratches be worked out in any way?"—In reply: We fear not.

PHOTOGRAPHING IN SPAIN.—R. S. G. writes: "Have any of your readers a knowledge of photographing in the south of Spain? I hope to be in Andalusia in May, and would be glad of hints."—Will some travelled reader oblige our correspondent with a few hints?

MESSRS. MARION & CO., of Soho-square, announce that their Annual Stock-taking Sale will be held from March 5 to 17. Catalogues with description of clearance lines from all departments, photographic and fancy, will be ready about March 1, post free on application.

PUZZLED.—As we understand your question, according to a decision given some years ago the copyright is not legally your employer's unless you assigned it to him. But we should not advise you to contest the matter, as morally, at any rate, the copyright is his.

PAPER FOR PLATINUM PRINTING.—PAPER writes: "Can you give me the address of one or two firms that can supply me with plain paper suitable for manufacturing platinotype paper?"—In reply: Inquire of Messrs. Marion & Co., Soho-square, W., or Messrs. Otto König & Co., 27, Cross-street, Finsbury, E.C.

INQUIRER.—1. The supplementary lens is perhaps best at the back, although we do not believe that in practice it makes much difference. 2. Such glasses as you require are, we believe, obtainable of Sharland's, Thavies-inn, London, and other wholesale dealers in optical goods. 3. Practically the coincidence of the foci would not be interfered with.

STAINED PRINT.—MOUNT says: "Will you please give me your opinion as to the stainings upon accompanying print? You will observe that the red part or stain on face is on the other side of that part which is free from the dye from mount."—The colouring matter on the mount is soluble, and, when the damp mountant is pressed in contact, it becomes stained and the stain shows through the print.

PHOTOGRAPHS ON PLUSH BLOCKS.—B. S. O. asks "the best way to stick a photograph on to the plush block after putting it on the glass. I tried gelatine and it stuck fast enough, but, when I took off the weight and looked at it, it was all over red blotches. Some one said to use glue, but wouldn't glue fade the print?"—Back the picture with a thick hard paper before cementing it to the plush, then the dye will not stain the photograph.

BOOKS ON EMULSION-MAKING, &c.—DRY PLATE asks: "Which are the best works published on emulsion-making and photographic chemistry?"—In reply: Sir W. de W. Abney's *Photography with Emulsions* (published by Sampson Low & Co., Fetter-lane, E.C.) and the *Science and Practice of Photography*, by Mr. Chapman Jones (published by Messrs. Iliffe, St. Bride-street, E.C.), would probably suit our correspondent's requirements.

VALUE OF GLASS POSITIVE.—SIDNEY RALPH says: "Enclosed you will find a glass positive of the Prince Consort, from which I think the well-known steel-plate engraving was executed. Will you inform me whether I am right, and as to its value?"—In reply: The photograph appears to us to suggest the picture. With regard to its value, we should say it is probably very little. The simplest way for our correspondent to find out would be to advertise it.

STUDIO-CONSTRUCTION.—S. H. WOOD asks if a studio about seventeen feet long would answer for general portrait work. "We have a room where we could take the ceiling away and put top light in the roof, if it would do. I have made a rough sketch, which I trust you will understand."—The proposed studio would answer very well so far as the light is concerned, but it will be very short indeed for general portrait work, and would necessitate the use of lenses of very short foci. Such lenses would, of course, give violent and unpleasing perspective.

PRINTING-OUT BROMIDE PAPER.—PHOTOPHILUS says: "I should be glad to know the formula for sensitising a rapid blackening paper, which blackens without development, such as is used in photometers. It can, I suppose, be fixed in hyposulphite of soda. It is wanted for a rough photograph of oxyhydrogen spectrum on a large, rough scale."—In reply: For your purpose, the immersion of ordinary sensitive bromide paper in a solution of potassium nitrite, of a strength of thirty or forty grains to the ounce, would probably answer. Immerse and dry in the dark.

YELLOW STAINS ON PRINTS.—W. BALL writes: "Kindly tell me the cause of the stains on these prints. They are on —'s paper, toned in the sulphocyanide gold bath, and fixed in hypo (two ounces to the pint). Time of immersion, eight to ten minutes."—The cause of the stains, undoubtedly, is that the prints are imperfectly fixed. Eight or ten minutes' immersion in a solution as weak as two ounces to the pint is not nearly enough to properly fix prints, particularly when the temperature is low. Use four ounces to the pint, and allow the prints to be in the solution for a quarter of an hour.

POSITION OF DIAPHRAGM IN R.R. LENS.—R. MATHER says: "I have a 6-inch R.R. lens of symmetrical construction; at the present time the rotary diaphragm is situated equidistant between the two combinations, but I am desirous of having it removed and placed closer to the front lens, so as to allow of greater length of screwed cell for focussing (please see rough sketch herewith); in doing so, shall I impair the efficiency of the lens?"—Yes, inasmuch as it will no longer yield straight lines at the margins of the picture. With a symmetrical lens the stops must be midway between the two combinations or it will not be rectilinear.

SLOW DEVELOPMENT AND LACK OF DENSITY.—BEDFORDSHIRE AMATEUR writes: "I have exposed a lot of plates on snow scenes, and I know that they are not under-exposed, but I cannot get sufficient density in the negatives. The plates are the same as I always use, and the developer (metol hydroquinone) also. The image is a long time coming out, and is then full of detail, but there is no printing density."—The trouble is, no doubt, due to the cold weather. Develop the plates in a room where the temperature is not less than 60° F., and see that the solutions are of a similar temperature, or a little higher, and all will go well.

THE LANTERN IN THE SHOP.—DARKLIGHT says: "I have a shop window on which I should like to exhibit some war pictures by means of the magic lantern. There are two panes of glass each measuring forty-two inches, and the depth of the shop from the window is five yards; can I exhibit same inside the shop, so that the people could see it outside, and what would be the best form of instrument for this purpose and also for the screen? Had I not better only exhibit on one pane of glass, as there is a partition between?"—Yes. The ordinary lantern fitted with a lens of suitable focus. On page 1128 of the ALMANAC you will find a table of distances with lenses of different foci for given size screens. A sheet of tracing linen will form a good screen for the purpose. It would be better to use one pane of the window if it will take the size of image you desire.

ETHO-OXYGEN LIGHT.—G. P. asks: "What quantity of oxygen does a saturator consume per hour? Is it double that required if burnt in an ordinary mixed jet? Could a saturator be used with an injector jet?"—In reply: It is some time since we used the oxy-ether limelight, but our experience then was that less oxygen was required per hour than with a mixed gas jet. One reason for this was that the nipple of the jet used at that time was small ($\frac{1}{24}$ inch bore), but the light was very good. The size of the jets used with the pendent saturators is, we believe, much larger, and, when employed with cylinders containing the oxygen under high pressure, gives good results. Three feet of oxygen per hour per light was about the average for the jet we used. Regarding the injector jet and saturator, we have had no experience, and would suggest you write to the Manchester Oxygen Company, or Messrs. Willway & Sons, engineers, Bristol.

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EX CATHEDRÀ.

PROFESSOR R. W. WOOD, the distinguished young American physicist, who is quite the lion of the hour at the chief London scientific societies, gave the members of the R.P.S. on Tuesday evening a series of three discourses of the very highest interest. His subjects were zone-plate photography, the photography of sound waves, and his own very elegant system of colour photography with diffraction gratings. The lecturer's remarkable lucidity of exposition enabled the meeting to readily grasp the principles upon which his valuable work has been founded, but it was obvious that the Professor had so much information to impart on the application of photography to physics that it would require a great many evenings to exhaust . The meeting was wholly charmed, surprised, and absorbed by the three lectures (of which we give a brief report elsewhere), and not least of all by the explanation of zone-plate photography, and the excellent illustrative examples shown on the screen. What is a zone plate? the ordinary photographic reader may ask. Simply a reduced photograph in bichromated gelatine on glass of a series of concentric rings, the original having a resemblance to a target. This little piece of what

appears to be almost plain glass may be substituted for the lens or the pinhole in impressing an image on the sensitive plate; but the rays are diffracted instead of being, as with a lenticular system, refracted. Hence there is produced in the negative what is equivalent to a duplication of outline, although, in the lantern transparencies from the negatives taken by Professor Wood with his zone-plate objective, blurring was not very noticeable. His pictures (landscapes) were made with an exposure of half a second; thus a zone plate is more rapid than a pinhole. We should not be surprised if zone-plate photography attracted much attention.

* * *

Most instructive results in the photography of sound waves were next exhibited and described by Professor Wood, but lack of space here prevents a lengthy reference to them. Suffice it to say that he amply showed, by photography, that most of the phenomena undergone by light waves are characteristic of waves of sound. A series of the Professor's diffraction transparencies (for such they are) were on view, and they attracted very great attention. Those of our readers who have seen specimens of Joly's colour lineature transparencies and Ives's kromoscopic transparencies may mentally form a good idea of what Professor Wood's diffractographs (may we be allowed to coin this word for temporary use?) are like. They are viewed by direct transmitted light, and the colours of the objects appeared, so far as we could judge, to be brilliant and spectrally pure. We regard Professor Wood's process of colour photography as the simplest yet devised, for it can be readily put into practice, and the results can easily be duplicated. Taking advantage of the simple process of printing with gelatine and bichromate of potash, the superposition of diffraction gratings on positives produced from three-colour negatives is obviously not a very difficult matter, and the pictures may be almost indefinitely reproduced. The finished result is an almost colourless picture, which, when viewed through a lens by direct transmitted light, gives an image in pure spectrum colours. This is the practical aspect of the matter. Scientifically regarded, Professor Wood's application of the phenomena of diffraction to colour photography is a valuable and original piece of work; and he deserves the thanks of British photographers for having personally brought it before them.

Our Patent Laws is the title of a little pamphlet by Mr. James Keith, C.E., of London and Arbroath, which discusses the system of patent protection now in force from a standpoint decidedly and deservedly unfavourable. We have often commented on the gross imperfections of the British patent system, and, on reading Mr. Keith's pamphlet, his condemnation of that system appeals to us in an aspect the reverse of unfamiliar. The author summarises the principal shortcomings of our patent laws by pointing out that a patent at present is simply a contract entered into between the Government and the inventor, by which the inventor is bound to make public every detail of his invention, and produce drawings so that any ordinary practical man can afterwards work from them. The inventor thus hands over the result of his brain labour to the nation, and he only gets the privilege of exclusively using and controlling his invention for at most fourteen years on his paying certain fixed charges. Should any of these fees not be paid, the patent from that moment becomes null and void. If, again, the fees are all regularly paid, after the term of fourteen years has been completed the invention becomes public property. As to protection, no real protection is given farther than, if the inventor has to go to law to uphold his rights, and ultimately wins his case—after having, perhaps, been practically ruined in law costs—the decision is upheld. It is this fact, that no protection whatever is afforded an inventor, which constitutes the greatest flaw of the British patent system. Mr. Keith's pamphlet should be useful in sustaining the agitation for an amendment of the Act of 1883. By the way, we are not in agreement with the author in his estimate of the United States patent system as "almost perfect." Our information, from reliable sources, is that nowadays it is little better than our own, the once valuable process of examination having been practically abandoned.

* * *

SOME information of an encouraging nature with regard to the progress of the movement in favour of adopting metric weights and measures is given in the recently issued report of the Decimal Association, which states that early in the past year a very influential deputation was organized by this Association to wait upon the President of the Board of Trade to urge the Government to fix a time for adopting the metric weights and measures compulsorily. In his reply to the Deputation, Mr. Ritchie recognised that the proposed change would be an advantageous one for the country, but he was of opinion that the public demand for it was not yet sufficiently strong to justify the Government in making it compulsory. He promised to assist in obtaining more efficient teaching of the system in the elementary schools, to have more attention given to it by H.M. Inspectors, and to do all he could to make known the merits of the system and the advantages which would follow its adoption. He also said that he was in communication with officials regarding its use in the various Government Departments. The strength of the growing movement in Great Britain has attracted renewed interest in the United States, and soon after the deputation to Mr. Ritchie the question was brought to the front again. In his Annual Report to Congress, delivered on December 6 last, the Financial Secretary to the Treasury at Washington strongly recommended the compulsory adoption of the metric weights and measures, and a Bill to secure this has been submitted to Congress. In Canada also a strong movement in favour of the metric

weights and measures has been organized, and there is evidence that the need of making the change is fully realised by the Government at Ottawa.

* * *

THE report further states that much correspondence with the leading School Boards of the country has taken place during the year, and over 100 of the most important School Boards in England and Wales have given renewed pledges to use their influence in support of the metric weights and measures. These Boards represent over ten million people. Although all the School Boards in the kingdom were written to, not a single one expressed an adverse opinion. Seven instances have been reported where the metric system was being properly taught in the public elementary schools, and these have been brought under the notice of the Committee of Education. It is hoped that, as a result of the representations, the new code will contain more definite instructions for the teaching of the subject and for examination therein by H.M. Inspectors. Steps are being taken to organize a special conference in Paris of official delegates and others representing Great Britain, the United States, and Russia, in favour of the adoption of the metric weights and measures in those countries. It is believed that this Conference may have important results.

* * *

IN our article last week, on experiments in the keeping qualities of dry plates, we mentioned that the plates were American manufacture, and we surmised that, inasmuch as their keeping qualities were to be tested, the plates were stored under careful conditions during the years they were stowed away. Our reference to this matter has been the means of eliciting the interesting fact that British-made plates are quite equal, and perhaps superior, to their American competitors in the valuable property of retaining their original good qualities unimpaired. In a letter on the subject, M. C. F. Jarvis, the well-known photographer of Birmingham quotes his experiences of some Ilford white label plates, which he had had in his dark room for some thirteen years. Upon development, these plates yielded results as good as could be obtained on newly made plates. Evidence of this nature is exceedingly valuable. Mr. Jarvis probably took only ordinary precautions as to keeping; indeed, he says he had forgotten the existence of the particular box of plates. The results on the American plates appear to have been more or less faulty, whereas the Ilford plates, after thirteen years, were as good as ever. On general as well as on particular grounds this testimony to the good keeping qualities of British-made plates is most welcome.

* * *

A FEW extracts from the annual report of the Geological Photographs Committee of the British Association will give some indication of the progress of the work in organizing a collection of photographs of geological phenomena in Great Britain: During the year 324 new photographs have been received, bringing the total number in the collection to 2321. The average yearly income during the decade has thus been 233. In addition to this, 61 prints and 6 slides have been given to the duplicate collection, making a total of 391 photographs received during the year. Mr. A. S. Reid has carried out a photographic survey of the Island of Eigg, and has already presented to the collection twenty-seven enlarged photo-

aphs, to illustrate the Scuir of Elgg and its remarkable history as told by Sir Archibald Geikie. Another connected series illustrating the physical history of the Yorkshire rivers communicated by Mr. Godfrey Bingley, who took the photographs at the suggestion of Mr. Kendall.

* * *

To Mr. A. K. Coomara Swamy the Committee are indebted for a large series of prints, taken mainly during excursions made by the Geologists' Association into Scotland, Devon, Dorset, Kent, Gloucestershire, and elsewhere; volcanic phenomena, unconformities, denudation, weathering, contortion, and the position of important rock zones are all illustrated by his series. Mr. Welch contributes, through the Belfast Naturalists' Field Club, forty-three platinotypes of glaciated surfaces and transported blocks, the Silurian district of Mayo and Galway, the volcanic district of the North-east of Ireland, and various tectonic phenomena are illustrated by the photographs. One set illustrates a new industry in the country, the excavation of the diatomaceous clay of the river Bann for use as Kieselguhr. The Midland district is beginning to be better represented in the collection, chiefly owing to the contributions by Mr. W. Jerome Harrison, Professor Allen, Mr.vers Swindell, Mr. Watson, and students of Mason University College.

* * *

THE photographs received during the year have been mounted, and are bound up and deposited with the rest of the collection at 28, Jermyn-street, where they may always be referred to on application to the librarian. The collection is arranged geographically in twenty-seven albums under the heads of counties and their natural topographical divisions. The report states that many geologists, British and foreign, have expressed a desire to possess examples of geological photographs which they have seen in the collection. The Committee are willing to undertake the publication of a small experimental series if a guarantee fund can be formed as a safeguard against loss. The publication would take the form of the issue of about twenty photographs in platinotype or carbon, or high-class process reproductions, accompanied by descriptive letterpress. If the subscribers preferred, lantern slides might be issued instead of prints, or in addition to them.

DISCURSIVE NOTES ON GELATINE PHOTOGRAPHY AND GELATINE.

THERE is at the present time scarcely a photographic process in practice in which gelatine does not play a very prominent part. The gelatine processes may be divided into two distinct sections which have no relation whatever to each other—those in conjunction with the alkaline bichromates, and those in connexion with the silver salts. The former is the older of the two. The first really practical applications of gelatine in photography were the carbon process of Mr. J. W. Swan, and the Woodburytype printing process of the late Mr. W. B. Woodbury, both of which were introduced in 1864, and each of which is now worked essentially the same as published by their inventors. It might, however, be mentioned that the photo-lithographic and the photo-zincographic methods were about contemporaneous with them. Then, a little later, we had the collotype and the "swelled gelatine" process, which

is dependent upon the expansive properties of gelatine when wetted; also photogravure and process blocks. These are all bichromated gelatine processes.

It is now twenty years, or a little more, since gelatine, in connexion with the silver salts (gelatino-bromide), superseded collodion for negatives in the portrait studio and in the field, though that still holds its own for negatives for some special purposes. Next we had gelatino-bromide paper for development, which took the place of collodion transfers for cheap enlargements, as well as those of a better class; and, within the last few years, gelatino-chloride printing-out papers, which, to a great extent, have taken the place of the old albumen paper. Indeed, it has pretty generally ousted it from the field amongst amateurs, but albumen and collodio-chloride are still much used by a considerable number of old-fashioned professional photographers. Whether these papers yield such good results, or the prints made upon them are as permanent, as those by the older processes, it is not now our purpose to inquire. Neither is it our intention to raise the question as to whether gelatine negatives are as good, or better, or are more stable than those made by the collodion process. One thing is certain, and that is, that gelatine photography with silver, is far more convenient in practice than the older methods, and it is for this reason mainly, more particularly with the paper processes, that it has assumed its present proportions.

When the gelatino-bromide process was first introduced, it was surmised by some of the first experimentalists that the kind of gelatine employed was of minor importance, it being looked upon by them as merely a vehicle to carry the bromide of silver. That, however, proved to be a mistaken idea, for it was soon found that it had a material influence on the resulting emulsion, whether for plates or for paper.

Gelatine is a very indefinite compound, no two manufacturers' being alike, and rarely are any two batches of the same make strictly identical, chemists even differ as to what is its composition. Now, if we consider the two sections of gelatine photography—those in connexion with the silver haloids and those associated with the chromium salts—we shall see how totally dissimilar they are in principle, and then it will be readily understood that the gelatine that might be suitable—indeed, the best—for one would be quite unsuitable for the other: for example, a gelatine may contain an impurity that would render it useless if it were employed in the silver processes, yet that impurity might be inert in any of the bichromated processes. On the other hand, a gelatine that contains other substances—say alums or other artificial hardeners, which may be harmless in connexion with silver, might yet be fatal if it were used in the bichromate processes. Hence it will be seen that the gelatine which would be suitable for one purpose in photography may be just the opposite for another.

As the majority of our readers are not interested in the manufacture of the plates and papers they employ, preferring rather to purchase them ready for use, we shall dismiss this portion of the subject and consider the other. In the different bichromated gelatine processes the character of the gelatine is, if anything, a more important factor than it is in the silver processes, for what may be the best for one may be, possibly, the worst for another, although the latter may be of a better quality as a gelatine. Take, for example, the carbon process: Here we require a tolerably soluble kind of gelatine, free from alum, acid, or such substances as would tend to bring about an

insolubility that was not due to the action of light; in fact, we require a rather poor quality from a manufacturer's point of view. If carbon tissue were made with a very high-class gelatine, such, say, as Nelson's X opaque, or Coignet's gold medal, it would prove very difficult of development, and have but short keeping qualities. If, on the other hand, it were made with a gelatine of too soluble a nature, the image would wash out in the lights during development, and the picture would be deficient in half-tone.

In the Woodburytype process the gelatine that is the best for making the reliefs is not the most suitable for producing the prints or casts from the leaden mould. Again, in the swelled gelatine methods a gelatine is required that will absorb a large proportion of water, and consequently swell up in high relief where it is not acted upon by light. But such a gelatine would be a very undesirable one to employ in the preparation of collotype plates, as it would yield too much relief when moistened for printing from.

From the above it will be gathered that the worker in the bichromated gelatine processes is largely dependent upon the kind of gelatine employed. Therefore he must study this subject, and, if he cannot get, commercially, a kind that will answer his purpose, he must perforce mix or blend together two or more sorts to suit his requirements. We allude to this subject more particularly, as we often notice in published formulæ so much water, so much gelatine, so much bichromate, and other materials, without any reference whatever to the character of the gelatine, which is generally the most important element in the case. This omission has led to innumerable failures on the part of experimentalists.

Modern Astronomy.—Prof. H. H. Turner, F.R.S., Savilian Professor of Astronomy at Oxford, has given the first of a series of three lectures under the above title. After referring to the revolution in astronomical methods that has taken place since the last quarter of a century, culminating in the immense size of the instruments now employed, he refers to the innumerable ways in which photography is now available. He laid particular stress upon the wonderful development of photographic apparatus, and pointed out that, by an instrument named the cœlostat, the whole sky was made to appear quite still for photographic purposes, though, of course, if one star can be made to appear stationary, it follows that the whole of the heavens included in a plate must also be equally free from movement. From the published abstract of the lecture, Professor Turner would appear to have referred to the invention of dry plates as having helped in the revolution of observing methods. This is a somewhat common error. The fact is, there were dry plates in use in photography before even the discovery of the collodion wet-plate process. What has rendered photography of such value is the discovery, not of a dry plate, but of the method of making it of extreme sensitiveness. The lecturer expressed the belief that the photographic lens would play a most important part in the astronomy of the future; and he described the spectro-heliograph, which enabled solar views of great accuracy to be made.

Monochromatic Screens for Corona Photography.

—It was suggested, at the last meeting of the British Astronomical Association, that it would be very desirable for one photographer to undertake corona photography by means of plates specially sensitive to a certain ray, and to use a screen capable of filtering out all other rays. It was pointed out that this would be a far more economical mode of procedure than the use of a large and heavy spectroscopic battery, and would be almost as effective. Objection was taken that it would be difficult to find such a combination of plate

and screen; and the President said that, if the member suggesting this mode of work could determine a range of wave-lengths that he thought would be useful, and would give particulars at the next meeting, it was probable that a standard screen for the purpose might be evolved from the labours of some members who had been giving particular attention to the use of monochromatic screens.

Aeronautic Photography.—Possibly there is no subject of a scientific nature having any connexion with military operations upon which so much nonsense has been published as the attractive looking one of photography and balloon work. The snap-shottting tele-photographer working at any distance and in any weather is a very familiar figure in print, though not in fact, as need scarcely be said to our readers; yet, at the same time, the camera and the balloon have done splendid service at the front, and will be capable of still more valuable work. If the familiar enthusiasm of the inventor is not playing us false, we are on the eve of a great revolution in ballooning, for the *Scientific American* has published a description by Dr. R. Danilewski of a dirigible balloon which he has now brought to perfection under the protection of the Russian Government. The disadvantages of the ordinary aerostat are its weight, the time taken to fill it, and the number of men required to put it into action. Dr. Danilewski's apparatus can be fixed up by three or four men and set going in half an hour. In shape it is like a stumpy cigar, with the point uppermost. It is inflated with pure hydrogen, and once set free can travel in any direction, and return to its starting place, at least, so the inventor states, and a picture of the balloon and aeronaut in the air is given. With such a small apparatus it is obvious that large weights cannot be carried, and thus the picture represents the one occupant, if we may so term him, suspended by tackle and not sitting in a car. But he is in an excellent position for snap-shottting, and, as he roams about in any direction, could obviously take an invaluable series of negatives and return for them to be developed quickly enough to be of practical use. According to the inventor's account he, at one of the trials, ascended out of sight for a couple of hours, and then returned close to the shed from which the balloon started. It appears that the impression his exploits produced was so strong that a number of Russian experts have given their opinion that he has solved the problem of aerial navigation.

THE DIFFRACTION PROCESS OF COLOUR PHOTOGRAPHY.

At the Society of Arts, on Wednesday evening, February 14, Professor R. W. Wood, of Wisconsin, read a paper on his system of colour photography with diffraction gratings. The first part of the paper consisted of a brief summary of the theoretical and practical outlines of the process. This having been fully reproduced in the JOURNAL of last year, from Professor Wood's former papers, we confine our present extracts from the Society of Arts paper (owning our indebtedness therefore to the Society's *Journal*) to the description given of the process of printing the diffraction pictures from the positives:—

“A sheet of thin plate glass is flowed with a solution of 5 grammes of gelatine in 125 c. c. water, to which has been added 4 c. c. of a saturated solution of potassium bichromate. The plate should be drained for a few seconds, and set on a level slab to dry, after which it is cut to the required size. I have employed several different methods of building up the composite diffraction grating, which forms the colour photograph, and am at present using the following arrangement as offering the fewest difficulties.

“The three gratings are mounted behind square openings in a thin board, which slides on a horizontal support in such a way that the gratings can be brought in succession into the same position. The positive corresponding to the *reds* of the picture is projected by means of an arc lamp and a photographic objective on to the 2000-line grating, the ruled surface being away from the lamp. A yellow glass is placed in the path of the rays, and the bichromated plate placed with its sensitive film in contact with the ruled surface. In-

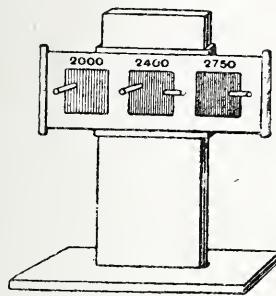
asmuch as the projected image can be seen on the grating surface, it is possible to register the position of the plate by means of two or three minute ink dots on the back. The use of the yellow glass is to prevent any transfer of the grating lines until the plate is in position and pressed firmly against the grating by means of a spring. An exposure of from one to two minutes is sufficient to impress the 2000-line spacing on all portions of the plate corresponding to the clear parts of the red positive. The yellow glass is again put in place, the green positive substituted for the red, and the operation repeated, using the grating with 2400 lines to the inch, registering the plate before the exposure by means of the ink dots. The same is now done with the blue positive and the third grating, and, on washing the plate in warm water at 32° C., the colour photograph is finished. The picture once formed in this way can be very rapidly duplicated by contact printing in sunlight on the bichromated plates, copies being made as quickly and with as little trouble as ordinary blue prints.

"To see these photographs in their proper colours we require a simple viewing instrument, consisting of a double convex lens on a light frame, with a small screen perforated with an aperture, mounted in its focus. The picture is placed in front of the lens, and the instrument pointed a little to one side of a gas flame or other narrow source of light. On looking through the aperture we shall see the picture in the most brilliant colours imaginable. The disadvantage of having to use but one eye led me to seek a method for viewing the pictures binocularly. The superposed spectra being formed, both to the right and left of the image of the flame thrown by the lens, if we can arrange matters so that the two points where the red, green,

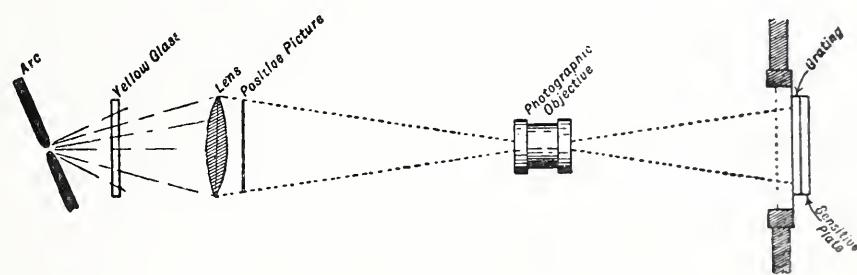
fortunately, they were only finished on the day of my departure from America, and I have not had an opportunity of trying them.

"A grating, with 2000 or more lines to the inch, ruled on a first-class engine such as the one at Baltimore, illuminates uniformly when placed before the lens, and is as structureless as a piece of stained glass. As I have said before, the lines visible in most of the pictures that I am at present able to show are due to errors of ruling, the grating lines themselves being, of course, quite invisible.

"There are other ways in which the process may be modified. We may, for example, combine the diffraction method with that invented by Dr. Joly. It is found impracticable to rule coloured lines to the number of more than three or four hundred to the inch; but we may rule as many as 1400 grating lines to the inch, and by arranging the engine so that it will rule at a variable rate, first a few lines at such a distance apart as to give red, then a few a little closer together so as to give green, then a few still closer together giving blue, we could produce a Joly plate which would appear absolutely structureless. It, of course, could not be used in the same way. This plate once ruled could be multiplied indefinitely by contact printing; and diffraction pictures could be made from it in several different ways, but, as I have as yet made no experiments along these lines, I shall not take the time of the Society in guessing at what may be done. It has been reported in some of the photographic journals that Mr. Thorp, of Manchester, has made and exhibited diffraction pictures showing all the colours of nature by employing a single grating. I must confess that I am at a loss to know how he has accomplished this, unless he had anticipated me and ruled a grating of variable



Grating support used in making diffraction photographs.



Arrangement of apparatus used in printing the first diffraction picture.

and blue are superposed are at the same distance apart as the eyes, we can employ both sets of spectra, and cut two peep-holes in the screen. This arrangement was found to work very well, but, owing to the varying distance between the eyes, is impracticable. Mr. Ives, of Philadelphia, suggested to me a very ingenious plan of arranging the grating lines horizontally on the picture, instead of vertically, and viewing the picture through a long, narrow, horizontal slit, instead of two apertures. Moving the eyes to the right or left would then produce no change in the colour, since the colours are arranged in a vertical instead of a horizontal band. Mr. Ives tried this method, but found it was necessary to employ two horizontal gas flames as sources of light, arranged at just the right distance apart, which is an undesirable complication. I have recently overcome this difficulty by using a viewing stand with two square lenses, mounted side by side, and a double or stereoscopic diffraction picture, which is viewed through a horizontal slit, in front of which are mounted two thin prisms for combining the pictures. This is by far the most satisfactory form of stand, for we can not only use both eyes, but see the pictures in full stereoscopic relief.

"Very promising results have already been obtained, though the distribution of colour is not yet satisfactory. The defects in the pictures thus far made are largely due to the very imperfect gratings that I have had to work with. The spacing of the gratings is not quite uniform, and they have, in consequence, a ribbed or corrugated appearance when placed in front of the lens. These corrugations show in all of the pictures, and are very detrimental to proper synthesis of the colours. A set of perfect gratings has just been ruled on one of Professor Rowland's engines in Baltimore, but, un-

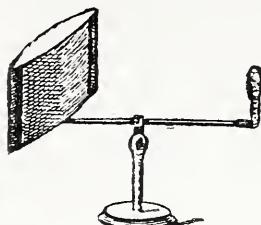
fortunately. If he is with us to-night, I know we shall be very glad to hear from him.

"There are still some difficulties to be overcome, and I do not feel sure that bichromated gelatine forms the best film for receiving the impression of the lines. It is interesting to note the theoretical possibility of producing one of these diffraction pictures directly in the camera, by bringing three diffraction gratings, ruled or photographed on three coloured screens, in succession in contact with the film of a fine grained plate. I have done this already with a single grating, but have not yet attempted the use of all three. Special plates would, of course, be required.

"Another peculiarity is that all distinction between positives and negatives disappears. A diffraction picture printed from another is identical with it both as to light and shade, and colour distribution."

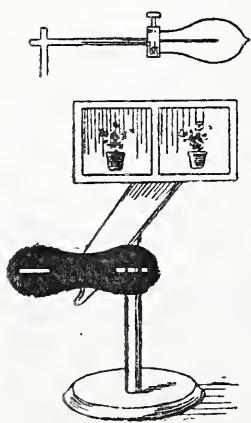
In the course of the subsequent discussion, Mr. Thomas Thorp said he was glad to have the opportunity of showing and explaining some of the work he had been doing in connexion with colour photography; but he disclaimed any originality in the conception, which was entirely due to Professor Wood. Mr. Butler, of South Kensington, described to him some of Professor Wood's first results, just at the time when he was engaged in taking copies of a diffraction grating of about 15,000 lines to the inch, which he was very successful in doing by casting. It had often occurred to him that such films ought to be of use in connexion with colour photography; but until Professor Wood showed the way it did not occur to him how they could be utilised. He found it was impossible to take copies of these films on gelatine on account of the closeness of the lines; up to 2000 or 3000 lines it was not very difficult, but it was almc

impossible to get anything satisfactory with the higher numbers by contact only. Then he added a little glycerine, so as to make the surface tacky, and then pressed the films into the gelatine; this produced a ridgy effect, and they were afterwards hardened by exposure to light. It was an astronomical subject he was dealing with, one of the mountains in the moon; he exposed on it about one and a half minutes; detached the film, washed it, and got the picture in hardened ridges. Then it occurred to him that he might get three pictures from one grating; he adopted the plan of horizontal lines to begin with, and he tried crossing two sets across the horizontal lines at a slight angle, and downstairs the effect could be seen of a photographic slide which had been printed in this way. He could not, however, print three copies on one plate; he must have three



Viewing apparatus.

plates. To use a film for each picture was rather troublesome, and he managed to take copies of a picture by simply pouring over it a solution of celluloid, allowing it to dry, and then tearing it off. The results, which could be seen downstairs, were obtained over six months ago, and had not been touched since. He wished to show the pictures in the lantern, but found it nearly impossible, and then it occurred to him to design a new set of lines which would allow of this being done, and at the John Hopkins University they said they were willing to try to assist him in the matter. He wanted a grating which, instead of showing a central image and spectra on each side, would throw all the light into one spectrum, and almost suppress the central image, and in that he had succeeded. By a grating of that character, having 15,000, 20,000, or 40,000 lines to the inch, he hoped Professor Wood would be able to make pictures



Position of lamp and stand for viewing stereoscopic pictures.

which would come out very brilliant. These lines were produced, not by diamond scratches, but by a kind of steam-hammer process, producing grooves of a saw-tooth section $\frac{1}{20000}$ inch in depth and $\frac{1}{1000}$ inch from ridge to ridge. The original metal ruling gave no spectra at all, but when copied in a celluloid casting it acted perfectly, as would be seen on the screen.

Professor Wood said the idea of getting all the light into one spectrum had been sought after for a long time, and Lord Rayleigh, in his article on the wave theory in the *Encyclopædia Britannica*, called attention to the fact that, if it were possible to produce a form of ruling, such as this saw-tooth pattern, this concentration could be effected. That this had now been done was an exceedingly interesting experimental verification of theory. If you got all the light

concentrated in one spectrum, it would be possible to project a diffraction photograph with a lantern; but, when it was scattered in several supernumerary spectra, the picture was not brilliant enough to allow of that being done.

Professor C. V. Boys, F.R.S., said he must express his admiration for the ingenuity Professor Wood had shown in, first of all, devising such a beautiful method of producing coloured photographs; and, secondly, in overcoming the numerous practical difficulties, and making it actually successful. Professor Wood had referred to Lippmann's method of coloured photography as being like a soap-bubble film, in which the thickness varied to suit the colour, but it was more than that, it was rather equivalent to a series of soap bubbles—he did not know how many—arranged one behind the other, with the thickness of a soap bubble between each, so that there were alternate films of more or less reflective or transparent material equi-spaced, and it was this constant repetition of the reflecting surface, or dissimilarity of optical property over constant intervals, which produced the extraordinary brilliant effects Lippmann had shown. There was, again, a curious similarity between the Lippmann colour photography and this method, from a theoretical point of view. In each case it was simple, having given the theory, to produce a colour photograph when you had merely one of the three primary colours, red, green, and blue, in any part of the picture; but in both cases it was puzzling how the effect was produced when you had two or three of the primary colours acting at the same spot simultaneously. In the Lippmann case, the fact that there were three series of films, all interlaced at three several distances asunder, occupying the same space at the same time, was so puzzling, that it was hardly possible to imagine how the optical result described could result. Lippmann set to work to obtain a mathematical expression which represented mixed colour light as met with in nature, and said, if that expression were worked out in practice, that light would result; and when he ultimately succeeded in producing the three sets of strata, all superposed and interposed through one another, that result did occur. Here, again, we had the curious effect of three sets of gratings superposed. He did not know whether Professor Wood felt confident before he tried it, but they would all work independently of one another—he certainly should not have done so, and it seemed to him a discovery, as well as an invention—that they did so act without getting confused with one another. The beautiful result Mr. Thorp had described in the grating the lines of which were not mere scratches, but grooves of a definite pattern, was a practical advance of the very greatest importance in the construction of optical instruments. We had also been much interested in learning that a celluloid film cast of a grating could be made, and he was surprised at the brilliant effect produced. For optical purposes, where the utmost definition was required, it was essential that the grating should be absolutely uniform, and that in no part of it should an accumulated error arise sufficient to bring a line where there ought to be a space. With 1000 lines to the inch there was no difficulty on this head, but, with gratings of 10, 20, or 40,000 lines to the inch, it required the highest precision such as could only be obtained by such a machine as Rowland's engine; and it occurred to him to ask whether there would not be a possibility of the film irregularly shrinking or being distorted to an extent sufficient to interfere with its value. He should have thought it possible to avoid this; but, if it were, they had here, again, a method of producing large optical gratings, sufficiently accurate for exact work cheaply, for which they were much indebted to Mr. Thorp.

Mr. Thorp said there was a slight shrinkage in the film, but there was an easy method of testing its accuracy. If the film were reversed and placed on the original grating, you saw certain interference bands, which afforded an easy mode of counting the lines. If there were any imperfect places, these bands would not be equidistant. He was some months before he could get the bands perfectly equi-distant; but, by very careful stoving of the films, they dried absolutely level, and when mounted on good frames they had shown four lines between the D lines. Dr. Ames, of John Hopkins University, had congratulated him on their excellence. One of them had 14,438 lines to the inch.

Sir William Abney said he must congratulate Professor Wood on a excellent and clear exposition he had given of the subject. Mr. Thorp must not take the credit of being the first to have a grating which gave one spectrum only, for he had one about three inches square, which was given him by Professor Rowland, many years ago, which had that property. It was a beautiful grating, and whenever he wanted to photograph the invisible part of the spectrum, beyond the red, he always employed it, because the photographic intensity of that part of the spectrum was so small. Of course there were ghosts of spectra of the second and third order, and on the other side a faint spectrum also, but, practically, all the light was concentrated in one. He believed that was the first grating of the kind brought to England, and the grooves in it, when examined under the microscope, were somewhat of the shape Mr. Thorp had described. This was a reflection grating, whilst Mr. Thorp's was transparent. That was hardly the place to enter on a controversy with regard to Lippmann's photographs, but he must say he preferred Mr. Wood's simple description of the matter to Professor Boys', for, although Lippmann had given an equation for the colours in his photographs, the colours which were reproduced were not pure spectrum colours, they were to a certain extent mixed. The method now shown was, to his mind, a more beautiful conception, and he only regretted that Professor Wood, like Mr. Ives, came from the other side of the water. He should like to know what light Professor Wood used for taking his photographs, because, to his mind, the difficulty was rather in the production of the originals than in the printing afterwards. With Mr. Ives's principle you could not use a monochromatic beam, you required a large portion of the spectrum.

Professor Wood, in reply, said he knew very little about the colour sensibility curves or colour filters, and therefore he contented himself with using Mr. Ives's kromograms for printing from, thus sparing himself the trouble of preparing original negatives, because they were far superior to anything he could produce with colour filters which he had at his disposal. With regard to parallelism of the lines, a slight deviation from exactitude made very little difference. If the lines were placed at right angles, one set would diffract horizontally and the other vertically, and the spectra would not be superposed at all, and would not fall on the aperture. With regard to the single grating with lines at different angles, Mr. Thorp would speak for himself; but he fancied that he broke up the light by mirrors into three sources, so that the direction was slightly different, and they were all brought to one focus. With regard to the complicated effect you would expect to get where two or more gratings were superposed, he was not quite sure; but he thought you got two sets of lines, and in addition shadowy bands, which sometimes, but not often, introduced spurious colour, by acting as lines of wider spacing.

Mr. Thorp said Professor Wood had explained the matter very well. He used three mirrors which acted as sources of light, and by moving the mirrors about you could get any colour you liked.

THE PREPARATION OF THE LINED SCREENS FOR THE JOLY PROCESS OF COLOUR PHOTOGRAPHY.

BEFORE the London Section of the Society of Chemical Industry, Mr. J. W. Hinchley, A.R.S.M., F.C.S., recently read a paper on the Joly process of colour photography. We are indebted to the Society's *Journal* for that portion of the paper and discussion we here reproduce. It deals with the subject of the preparation of the lined screens, and, after a brief outline of three-colour photography, proceeds:—

It is to Joly, in 1894, that we owe the step from composite colour photography to the true colour photograph. His idea, he says, referring to the Young-Helmholtz theory, "is to carry the appreciation of physiological principles still further, and divide up the plate like a hypothetical subdivision of the retina, so that all over the plate there should be minute regions uniformly distributed, wherein the sensitive silver salt is excited to become reduced to the 'photogenic' material in the same degree in which the sensations of redness, greenness, violetness, would have been actually excited in the several nerves of the retina, had the image been formed upon

it." The essential point of the process is a method of colour mixture which does away with optical superposition, and is at the same time extremely simple. If strips of colour sufficiently narrow be placed side by side and viewed from a suitable distance, the eye will perceive the colour due to their mixture. Acting on this, Joly combines the two sets of three screens into two, one a taking screen, and the other a viewing screen. Each consists of a glass plate carrying lines of the three colours side by side, these lines being less than $\frac{1}{225}$ of an inch wide, and in contact with each other without overlap. By means of these screens the production of a colour photograph is comparatively a simple operation; the interceptor being placed in the lens of the camera, the plate and taking screen are arranged in the dark slide, film to film, in such a way that on exposure the lined screen filters the light before it reaches the plate. On development, a negative is obtained, recording in density of silver deposit under the three lines the degrees in which the several colours of the object have power to excite in the eye the three fundamental colour sensations. A positive printed from this negative, and adjusted in contact with a viewing screen, so that the red record line of the positive coincides with the red line of the screen, and the other lines similarly coincide, will reveal the object in its true colours. The ease and accuracy of the method are remarkable, for all the difficulties which the worker in composite colour photography has to face are overcome in the manufacture of the screen. If the taking screen in photographing a white object gives an equal density of silver deposit under each of the lines, then the colours of any object will be correct; should one of the lines be too dense, an alteration of the interceptor, by tinting it slightly to cut off the particular colour, will bring about the equality easily.

It will be readily understood from this description that the manufacture of the screen is not a simple process. The glass plates on which the lines are to be placed are thoroughly cleaned after the manner adopted in dry-plate manufacture, except that the necessity for perfectly clean glass is, if possible, greater; they are then coated with a film of gelatine, somewhat thicker than that of a dry plate; the gelatine used must be very hard, and, at the same time, as absorbent as possible; and, since the certainty of chemical action on the dyes prevents the use of antiseptics, the gelatine solution must be freshly made at as low a temperature as possible.

The operation of lining the plates is a most difficult one, and is carried out in exceptionally accurate ruling machines, ordinary drawing pens, carrying reservoirs of red, green, and violet inks, being the means of producing the lines. The pens are trailed across the plate, and, the pressure allowable being very small, the lightest pen consistent with rigidity that can be made is used.

In the early machines the spindles of the pens rested in V grooves, the lateral movement being prevented by little magnets attracting a disc on the spindle against the adjusting screw. Ruling took place in both directions of movement, each side of the pen being used alternately. It was found, however, that a great many difficulties, mechanical and photographic, could be avoided by ruling with one side of the pen, and in one direction only. In the latest machines the pens swing in jewelled bearings, rule in one direction, and are lifted on the idle or quick return stroke. Time for the absorption of each line is provided by each pen ruling a few lines in advance of that following. About one and a half minutes is required for efficient absorption. The inks are water inks, aniline dyes being used to produce the intense colours necessary, and gums to give them viscosity.

After much experiment and failure, it was found that regard must be had to the following points:—

1. The hygrometric state and temperature of the air.
2. The shape of the pens and the pressure they exert on the film while ruling.
3. The viscosity of the ink at the temperature of ruling.
4. The rate of ruling.
5. The correct adjustment of the pens.
6. Absolute uniformity of conditions during ruling.

Of these the hygrometric state of the air is perhaps the most important factor, for, should the air be too dry, the ink in the pens becomes too thick and refuses to rule, and too much moisture causes

difficulties from the non-drying of the ruled lines. The evaporation of the water from the ink line is negligible in comparison to its absorption by the gelatine, and since gelatine is very sensitive to changes of temperature and hygrometric state of the air, there are limits to the temperature of ruling, and at any given temperature there are definite limits of hygrometric state. At low temperature (10° or 12° C.), the dew point may be 7° or 8° below the temperature of ruling, without serious consequences, but every degree above this temperature narrows the hygrometric limits considerably, until, at 19° C., the limit is between 1° and 2° C., and above this temperature ruling becomes practically impossible.

The shape of the pens is also an important factor; the nibs should slope evenly together, their inclination to each other being about 3° . The points must be semicircular in form, corresponding to the natural shape of a drop, and the diameter of the semicircle must not be more than two mm., or it becomes difficult to maintain the exact width of line. The ends of the nibs must be carefully shaped and brought to knife edges, which are finally rounded to prevent the cutting of the film, by rubbing on wash-leather. One pen will rule about 100 plates before requiring to be reset; thus its point will rub on gelatine for two miles before the wear is such as to cause bad or faulty lines. The pens are trailed across the plate, their own weight giving the pressure required to maintain a continuous line. Under ordinary conditions, they are inclined about 5° or 8° , for the pressure on the plate must not be more than one and a half grammes. If one nib is a little longer than the other, or if it touches the ridge formed on the gelatine by the previous line, a wavy line is the result, and the screen becomes useless.

It was speedily found that the quality of the screens depended on the viscosity of the ink, and the necessity arose for the measurement of this property. The inks being opaque, ordinary methods were unsuitable, and, finally, the measurement of the rate of flow through a capillary tube into a constant partial vacuum was found to provide the simplest and easiest test.

The rate of ruling will depend on the viscosity of the ink. With ink giving the best results, the speed is about seven-eighths of an inch per second.

The adjustment of the pens was a mechanical question which gave a great deal of trouble, but was solved by means which need not concern us here. The distance apart of the nibs was usually found to be about seven-eighths of the width of the line ruled. With too viscous ink, however, the nibs are found to be wider apart than the width of the line ruled, and in this case the ruling becomes very erratic.

Perhaps no more important factor in any manufacture is uniformity, and no product could suffer more from lack of this than the Joly screen. A rise in temperature of only 1° C. means at some temperatures a lowering of the viscosity of the inks to less than half their former value, with the result that the lines, on account of an increased flow of ink, widen. A correcting tendency, however, appears in the increased rate of absorption of the gelatine, so that the after-spread of the line will be less. Again, should the hygrometric state of the air alter, the absorption of the gelatine increasing or diminishing will bring about similar changes; also, while ruling, the slight drying of the ink in the pen produces a secular narrowing, so that it is necessary to commence with a wider line than would produce a perfect screen.

All these changes have their corresponding colour changes, which make it imperative to ensure absolute uniformity of conditions, for true colours are just as essential to perfect results as perfect ruling.

After the ruling of the screen is an accomplished fact, it is dried by warm air for some hours and protected by varnish. A satisfactory varnish, which would not attack the colours or dissolve them, could not be found, and, finally, a compromise was made; and, though the medium of the varnish slightly dissolved the green dye, the loss of colour, with a very concentrated varnish, was so small as to be quite inappreciable.

The manufacture of celluloid films and interceptors is a subject great enough for a single paper, and calls for no special mention at the end of this.

All methods of testing the inks for the truth of colour were

found to be unsatisfactory unless applied to the ruled line, and the greatest difficulty was found in preserving uniformity in this respect; perhaps the greatest need of all was that of a green dye, whose absorption would enable the adopted curves to be imitated more closely.

All the attempts to photograph landscapes by the Joly method were, for a reason which remained mysterious for some time, failures; natural greens, illuminated out of doors, were hopelessly wrong, while the same greens photographed in a studio were reproduced correctly. The failure was proved to be due to a defect in the old spectrum plate, which was very sensitive to a band of no colour value on the border of the visual spectrum at the red end. All attempts at cutting out this band (it was transmitted by all three lines) were unsuccessful until, by accident, it was found that a trace of mercuric chloride, added to an ethyl-green solution, would do so. A method based on this was too complicated for practical work, and, when the new spectrum plate appeared, was rendered unnecessary. By means of this plate correct renderings of all colours could be obtained.

The discovery of permanent dyes, of film materials, &c., must proceed further before any great advance in this work can be expected, and we can only hope that the results of the diligent workers of the past may encourage those of the present to make colour photography still more of a practical success, rather than a laboratory experiment.

In the course of the discussion which followed Mr. Hinchley's paper, Mr. J. Cadet said he would not say that it was necessary that every chemist should be a photographer, but it was unquestionable that every photographer ought to be a chemist, and it would not be amiss if the Society took more account of photography than it did at present. The chemical reactions that were involved in photography were even more puzzling than those in the average range of chemical research, for in photography they had not only chemical reactions, but also physical conditions to consider, and these were often baffling. For this reason photographic manufacturers needed the aid of the chemist. For instance, very little was known of the nature and properties of gelatine, the principal basis of the modern dry plate. That body had been the bane of his existence. What they wanted was a chemist who would devote his life to gelatine, and until some such help was forthcoming photographic manufacturers would be condemned to flounder on in helpless ignorance. The paper to which he had listened that night had given him an insight into the Joly process which he had never possessed, and had enabled him to appreciate its difficulties, especially as to the production of the beautiful screens they had seen. With regard to the plates themselves, it was easier to make a plate sensitive throughout the whole range of the spectrum than to make one with a gap in the extreme red such as his own sensitive plates had. It had taken him two years to do this. Plates sensitive throughout the whole of the spectrum could only be made by working in total darkness; such a procedure was absolutely impossible in a factory where tons of plates had to be produced. The author, in speaking of Maxwell's curves, had omitted, no doubt unintentionally, to mention the curves given by Sir William Abney in his lecture before the Royal Society. Sir William had drawn the curves in such a manner that the various colour sensations were represented as the various fundamental colours, *plus* white light excepting the red; and since the reading of that paper they had had something tangible to go upon. The only fundamental sensation they could have in perfect purity was the red; in the green, one must have white light or mixtures with the blue and red, and, if those curves were drawn so that they crossed each other *plus* white light, the purest effects of colour were maintained. Sir William Abney had given us these particular curves for the first time, and to manufacturers and all interested in the future of colour photography they would be of the utmost value. What was really required in the sensitive colour plate? It must be affected by the various portions of the spectrum so as to give densities proportionate to the logarithms of the intensities of light in the spectrum itself. It was impossible to single out the colour-sensation curves. They must have admixtures, but, if the plate followed those curves, they had all

that was necessary. With regard to the future, he thought they need not sigh for a material which would give all the colours of nature, for in getting those they would lose all that reproductive power which tricolour printing gave them. If they could make screens which would give results on the plates comparable with the curves, and printed in inks transparent in themselves, which were the complementaries of the colour-sensation curves, they would have all that would be necessary to reproduce colour. From three negatives and half-tone blocks, twenty million prints had recently been made, and the prints from them were chosen in preference to some of the best lithographic artists' work. The author had given so able a description of his process that it was unnecessary for him to say more. He believed that before long trichromatic printing would become the general process in use. The regular illustrated journals would probably be printed by these means, and the eye would be satisfied by its rendering of colour.

Dr. S. Rideal said the point that interested him most was the difficulty which the inventors had had in ruling the lines of their screens with viscous gums. He had done considerable work on the viscosity of gum solutions, and had encountered most of the difficulties referred to by the author, due chiefly to variations of temperature. If he remembered rightly, he had managed to get what he called a gum solution of standard viscosity by using ordinary gum arabic mixed with an insoluble gum. The viscosity of a gum depended on the presence of insoluble metarabin, and the amount of metarabin varied with gums grown at different temperatures and under different conditions; but, by taking a soluble gum and adding insoluble metarabin, such as occurred in the cherry, it was possible to make a body of constant viscosity, and he ventured to think that this course might be found useful by the author.

Mr. W. F. Reid asked if it was absolutely necessary to make the screens of gelatine. From the details which the author had given him it seemed to him that a substance had been chosen for those screens which offered the utmost difficulties. Would it not be possible to use, say, celluloid or another substance which he had exhibited not long ago? If some such material were employed, it seemed to him that it would be possible to produce the lines by merely pressing the sheet of celluloid or similar material against a metal plate upon which depressed lines had been engraved. The colour could be applied to the raised lines thus produced by means of a roller in one operation, and, if necessary, the raised lines could be flattened by pressing on a level plate. Then, again, he author had chosen for his inks aniline dyes soluble in water. But water itself, from the hygroscopic nature of our climate, produced difficulties of its own. Why not choose a liquid in which aniline dyes are soluble, and which might produce very good lines upon such a substance as celluloid? There was a great deal of truth in Mr. Cadet's remarks as to the necessity of investigating the properties of gelatine; for the irregularity of those properties brought about difficulties in the various processes in which gelatine was used. It would be quite possible to use gelatine as a thickening material for the ink, which could be done by denuding it of its gelatinous properties, and thus the ink would not be so susceptible to atmospheric variations as gum arabic was.

Mr. J. W. Hinchley, in reply, said that in writing the paper his great difficulty was, not to find matter to put in, but to decide what to cut out. He had cut out what he had wished to say with regard to Sir William Abney's curves in order to give more prominence to the practical part of the subject, which he deemed would be more interesting for the Society. Referring to Mr. Reid's remarks on the manufacture of the screens in some other way, he had made a great many attempts to use celluloid and other substances, but all his attempts had ended in failure, and he was hopeless of finding any substance which would compare with gelatine in its wonderful absorbing properties. The suggestion of adding insoluble gums to the gum solutions used in making the inks was a valuable one, but in a short time precipitation of the dyes might occur. He had attempted to overcome the difficulties of the hygometric state of the atmosphere by providing an artificial atmosphere in the instrument itself; but this attempt failed, because variations could not be avoided, and the slightest change altered the lines. With regard to

Mr. Reid's suggestion as to producing the lines by pressing a roller on the material employed, it must be borne in mind that they must be of a certain width throughout, and transparent. It was easy to merely draw lines, but the difficulty was to draw them of such an exact width as to join without overlapping, for even the overlapping of one-twentieth the width of a line would make a perceptible difference on the screen. Owing to the absorbent character of gelatine, it was possible to draw the lines so that they filled up the space completely without overlapping, whereas with another material they would have to wait for the lines to dry. The great difficulty, however, was to make the atmospheric conditions constant.

FOREIGN NEWS AND NOTES.

To Remedy Over-exposure.—The Belgian photographic paper, *Helios*, gives prominence to the following method of curing over-exposure, which was communicated to the Berlin Photographic Society by H. Schmidt, of Munich. If the plate shows signs of over-exposure by flashing up immediately it is placed in the developer, it should be taken out at once and well washed under the tap. The plate should then be bathed for a few minutes in a solution of 5 grammes of nitrate of silver in 100 c.c. of distilled water, and development should afterwards be effected by pouring a small quantity of developer upon the plate held by one corner as in coating with collodion, the object of this being, of course, to retain as much nitrate of silver in the film as possible. If this process of physical development does not give sufficient density, the negative must be intensified, and for this purpose H. Schmidt prefers the following pyro-silver intensifier:

No. 1.	
Pyrogallic acid	10 grammes.
Alcohol (strength 96 per cent.)	100 c. c.
No. 2.	
Nitrate of silver	4 grammes.
Citric acid	6 "
Distilled water	200 c. c.

For use dilute 4 c. c. of No. 1 with 100 c. c. of water, and when about to intensify add 4 c. c. of No. 2. For a half-plate, 25 c. c. of solution should suffice, and, as the solution should be freshly mixed, it should not be prepared until wanted. It is preferable to intensify before fixing. Herr Schmidt says the process gives excellent results with plates which have received six to ten times more than the normal exposure. Although this limit is within the control of the ordinary means of development, the process seems worth consideration.

Grained Screens and the Salon.—In the same periodical M. Léon Vidal recommends MM. Puyo, Demachy, Brémard, and their imitators, who affect the peculiarities of style associated with the gum-bichromate process, to try the effect of a grained screen. M. Vidal recommends that the primary negative be made in the usual manner, but that a good positive be then produced, and from it a printing negative by copying through a grained screen. From this second negative the print may be produced by the gum-bichromate, carbon, platinum, bromide, or any other process. The print would have the characteristics of a crayon drawing, and, if necessary, might be produced upon rough-surface paper. The process would lend itself very effectively to polychromatic work, and by it the monotony of large areas of half-tone could be considerably relieved. The suggestion appears to be one of great promise, but it would be a remarkable instance of the irony of fate if the apotheosis of artistic photography were attained by means recommended for the obliteration of the mechanical effect of process work.

The Combined Toning and Fixing Bath.—In speaking upon this subject at the Berlin Photographic Society, Dr. E. Vogel stated that it was not advisable to use the combined bath for commercial photographs, notwithstanding its convenience and the fine tones it produced. It was capable of giving durable prints when in good condition, and he had found that the pictures faded less rapidly when a fresh bath was used. There was no definite explanation of the causes of fading with this process, but the atmosphere, without doubt, was a factor. It was an extraordinary fact that there was no fading where marks upon collodio-chloride paper were due to perspiration from the fingers. Professor Raschdorff stated that he had noticed that the combined bath would keep good in summer, but not in winter. He used a mixture of old and

fresh solutions, which gave him satisfactory results. Herr P. Hanneke said that, as a test, he had mounted a collodio-chloride print, toned in the combined bath, and poured a solution of hyposulphite of soda upon it, and allowed it to remain in that condition for several hours. The print was then slightly rinsed, and, after a lapse of two years, had not shown the slightest trace of fading.

Silvering Mirrors.—The *Chemiker Zeitung* gives the following directions:—I. Dissolve 30 grammes of nitrate of silver in 240 c. c. of distilled water, and add ammonia, drop by drop, until the precipitate first formed is redissolved. Avoid adding ammonia in excess. Filter and refilter through the same double filter paper until the liquid is quite clear. Make up the quantity with distilled water to 480 c. c. Keep the solution in a clean flask, in a cold, dark place.

II. Dissolve 0·75 grammes of Rochelle salt in 300 c. c. of water, heat to boiling point and add 0·166 grammes of nitrate of silver, stir with a clean glass rod, and boil for ten to fifteen minutes, until the solution acquires a grey colour. After filtering, dilute the solution to 480 c. c., pour it into a clean flask, and let it stand from six to eight hours in a cool, dark place.

For use, take 30 c. c. each of Nos. I. and II., mix, and add 120 c. c. of distilled water. Clean the glass very carefully, pour the fluid upon it and let it stand for about an hour, for precipitation of all the silver. Rinse the glass with water and stand it on end to dry.

Photographic Journalism.—The *Wiener Freie Photographen Zeitung*, in reply to the question, "Where did the first photographic newspaper appear?" states that the *Journal of the Daguerreotype and Photographic Arts*, published in New York, in 1849, by S. D. Humphrey, may claim the premier position. In the following year, *The Daguerrian Journal* also made its first appearance in New York. The third place may be claimed by a Parisian paper, *La Lumière*, published by A. Gaudin. The first German photographic paper, the *Photographisches Journal*, was brought out, in 1853, by W. Horn, of Prague, and in 1857 the *Photographisches Album* was issued by Weingartshofer, of Vienna. From the reference in our issue of January 5, our readers will be aware that THE BRITISH JOURNAL OF PHOTOGRAPHY made its first appearance in 1854, and it is with pardonable pride that we note the remark of the *Wiener Freie Photographen Zeitung*, that THE BRITISH JOURNAL OF PHOTOGRAPHY is truly the best professional photographic journal in the world.

Panchromatic Emulsion for Colour Photography.—In the *Photographische Rundschau* Dr. Neuhauss confirms the observations of Professor Valenta that glycinroth (obtained from Kinzelberger, of Prague) is an excellent sensitisier for red. By the addition of this dye to the grainless emulsion for Lippmann's process, he obtained plates which not only rendered all the colours of the spectrum from red to violet, but also correctly reproduced mixed colours. The sensitising solution is prepared as follows:—

Alcoholic solution of cyanine (1 in 500).....	3 c. c.
" " erythrosine (1 in 500) ..	2 "
" " glycinroth (saturated) ..	10 "

This quantity should be added to 100 c. c. of freshly prepared emulsion. Place the emulsion on ice to set it as quickly as possible, break it up and wash it in the usual manner. The 15 c. c. of sensitising solution raise the temperature of the emulsion 1·5° C., and, as it is desirable not to allow the emulsion to exceed 40° C. to prevent ripening, care should be taken that its temperature does not exceed 30° C. before adding the dye. The washed emulsion keeps very well; but, if left in the unwashed state, the emulsion ripens and loses its transparency.

Technical Education.—We read in the *Photographische Chronik* that the firm of Carl Zeiss has offered to build an Institute for Technical Chemistry and Physics in connexion with the Jena University. Dr. Otto Schott, of the Jena Glass Works, will also contribute 2000*l.* for the equipment of instruments.

A FUNCTION AT THE LONDON AND PROVINCIAL.

THERE was an unusual sound in the Editor's office. It was mid-day. The unusual sound was the scratching of a pen-nib. It was interrupted by a tap at the door. "Come in," said the Chief. "Please, sir," said a junior clerk, "here's a letter for you, and the man says he is to wait for an answer." The Editor opened the letter, and, as he read, various expressions flitted over his face, though they were but momentary. Indifference gave way to interest, this was followed instantly by incredulity, which in turn gave way to hope, and finally ended in a beam of agreeable

surprise. The letter contained an enclosure—the enclosure was a ticket for the Second Annual Supper of the London and Provincial Photographic Association, to be held at their Headquarters, at the sign of "The Swan," in Tudor-street, Whitefriars (of ancient memory), on the evening of Thursday, February 15 (century uncertain).

The look of indifference on the Editor's face was caused by the sight of the supper ticket (they are so very numerous just now); the look of interest was created by the request set forth in the letter wherein he was desired to preside at the supper; the incredulous look owed its origin to the promise of a better supper on this occasion than heretofore; and the look of agreeable surprise came from the perusal of the musical programme to be provided by Mr. Vivian Hyde.

After "careful consideration" (that divine gift vouchsafed to all journalists and to editors in particular), the Chief returned a reply "per bearer" that he would be delighted to accede to the cordial request of the honourable member for Chancery Lane, to take the chair on the auspicious occasion referred to in his letter of even date.

The postscript to this letter was somewhat of a private nature and contained language of a highly technical character, not intelligible to the public mind, but of great interest to members of the Society, and it might not be out of place to mention it here.

The Head suggested in this letter that the Society should negative the use of strong developers as these are calculated to interfere very materially with the theory and practice of stereoscopic vision, as advocated by him at the last Convention at Gloucester. The effect of these developers in the solution (the photo-chemical equation of which was $WSKY^1 + H_2O^2$) would be to multiply the object once or more if used in excess or in the wrong quantities.

He said he advocated one part of WSKY to two parts of H_2O as the proper proportions.

A friend of his (the Chief's) used these in the wrong quantities, putting one part of H_2O to two parts of WSKY, and the result, he said, was to interfere with the normal vision to such an extent as to land him in a serious dilemma.

It happened like this.—He (the Chief's friend) had been using this developer rather freely, and in the evening went home. He lived at No. 111, Bunkers Hill, S.E.

Silently he opened the door and stole up on tip-toe up to bed. He sat down on the bed, or what he thought was the bed—but it was the wrong one—his optical vision was slightly out of focus, and he sat on the floor.

The noise brought up the proprietor of the house, who was below, and the Chief's friend was escorted to No. 111. He had gone to No. 11 by mistake; such was the effect of the patent developer on the image on the retina.

The correction for this kind of visual refraction, the Editor said, was an application as soon as practicable (when dry) the following morning of a little clearing solution. This will always neutralise the effect of over-development.

I am told that the above letter, although of a semi-confidential kind, will be preserved by the L. and P. Society amongst their most treasured possessions; but it does not shed any light upon the next question, "at what point should this development be discontinued?"

* * * * *

"The supper waits, sir."

So spoke the resplendent white-beshirted waiter at "The Swan" to the Chief, as the latter chewed the cud of reflection and the end of an anti-festal cigarette.

Some thirty-five members and guests were already assembled in the supper-room, as Chamberlainlike with ornate button-hole and inscrutable but smiling countenance, the Chief took his seat at the table amid applause.

Then a mammoth edition of the auctioneer's hammer fell with a thud (like a "Little B'obs" bomb), and grace was said, whilst each member unconsciously fidgeted with the bottom button of his waistcoat.

Then we fed—wisely perhaps—but not too well. The supper was served much more creditably than last season, though the viands were neither numerous nor costly, yet, wholesome withal.

The Hon. Secretary subsequently explained that the landlord, last year, only provided, for those who were expected (about thirty-five), whereas about fifty turned up. This, doubtless, accounted for much adjectival invective concerning the prior function at "The Swan."

There was a good piano too, not the defunct anatomy of an eighteenth century spinet, as on the former occasion.

After supper the hammer descended again, and the Chairman 'owled "ere's y'r 'ealth, gentlemen," which he drank by himself. This was very kind of him, no doubt.

The first toast was the patriotic one to the "Greatest woman on earth," which was drunk with enthusiasm and in a true and warlike spirit as became a "Fighting Society."

The toast list was not a long one, but it included "The London & Provincial," "Our Officers," "Absent Members," "The Visitors," and "The Chairman and the Photographic Press" (God bless 'em).

The intervals for refreshments were frequent.

The music was good, so was the singing, and the other entertainers were excellent.

After a few intervals the toasts and the music and the singers and the

ories got slightly out of focus, but that must have been the tobacco noke.

Somebody called the London & Provincial a "Pugilistic Society."

Somebody else said it was an "Expectoration Club."

A third thought with all those personal toasts that it was a "Mutual admiration Society"—any how, it spent a very pleasant evening, and Mr. Hyde although disappointed in two of his friends was well supported by Mr. Aubrey Wills, Mr. W. E. Dunmore, and Mr. F. Godfrey for the latter comedy of the evening, whilst the gentleman who presided at the piano gracefully charmed our senses with his digitorial proficiency on the keys, and, as the Chief said at the conclusion, "it will all remain in the archives of one's memory."

Doubtless it would but for that tobacco smoke.

A VISITOR.

EXHIBITION OF THE WEST LONDON PHOTOGRAPHIC SOCIETY.

THE Eleventh Annual Exhibition of the West London Photographic Society, which was open at the Lecture Hall, Broadway, Hammersmith, on the evenings of Friday and Saturday, the 16th and 17th inst., showed that the Society still maintains its high standard.

It is to be regretted that the Society cannot find a more congenial surroundings than the doleful schoolroom to which we make our annual pilgrimage on the occasion of the Society's Exhibition. In these days, when the importance of the education of the people in technics and art beginning to be recognised, it should be a duty of those who have the local management of such things to assist the Society in this respect. The Society, which is not a large one, and not a wealthy one, cannot do more than it does, but it can, and does, form a collection of photographs every year which at a very slight expense might be made to afford both pleasure and instruction to a vastly larger section of the community than now have the opportunity. In London we are very far behind the northern and midland manufacturing districts in matters like this.

We must say that our impression of the Exhibition was not an exciting one. There was nothing there that raised our enthusiasm, and nothing here sufficiently bad to give us the opportunity of delivering a lecture upon. The beginners even, if there were more than one, had perpetrated something that deserved a more emphatic word of condemnation than "uninteresting." The beginner, if he was the sole representative of his kind, condoned his faults, the want of interest of his subjects and such inattention to details as not trimming his prints, so that perpendicular lines were perpendicular, by admirable technical photography.

To us—and perhaps a long succession of visits to photographic exhibitions has somewhat blunted our appreciation of many works that would ease the majority—the prevailing feature of the Exhibition was its meanness. There was not a great variety in the subjects, and some portraiture and figure subjects, for instance, seemed to be almost entirely neglected. The members seem to be content to draw their inspiration from one another. The fact that each member's work is hung together facilitates the recognition of any marked individuality or mannerism it exists, but so little was any such thing apparent that we could quite believe that the Exhibition consisted of the work of three or four members instead of the fourteen that we understand contributed to it. We think it a great pity that the Society should follow so closely its old additional style, for, though we willingly concede that the work of the present year is equal to any of that of the past, in comparison with the progress made during the past two years by some of the other metropolitan cities which hold exhibitions, the West London Society does not keep pace. The lines upon which the Exhibition is run, no classes and no awards, are undoubtedly admirable, but the system does not seem conclusive, at any rate in the present instance, to the encouragement of that variety which is absolutely necessary to make an exhibition interesting. We have mentioned the neglect of portraiture and figure studies. We only noticed one picture of the kind really worth regarding as a serious tempt. Architecture, again, was hardly represented, and we do not remember to have seen a single flower or fruit piece. In pointing out the direction in which the Exhibition could be improved we do not wish to be understood that we are condemning the work that was exhibited. A large proportion of it showed considerable appreciation of the pictorial possibilities of photography, and, generally, it was tastefully got up. The principal exhibitors were Messrs. Leslie Selby, W. Selby, G. Lamley, F. Holding, F. C. Hart, W. Gillett, M. W. Cockerell, A. E. Cockerell, M. Bartlett, E. C. Beard, and G. F. Blackmore.

There were lantern shows each evening. The series we saw on our visit, illustrating the scenery of one of the wildest parts of Ireland, were admirable, and the description by their author, Mr. Lamley, most interesting.

Our Editorial Table.

NOTES ON ILFORD PURE PLATINUM PAPER.

Published by the Britannia Works Company, Ilford, E.

The Britannia Works Company inform us that they are now adding x 4 Platona paper to their list, twenty pieces being supplied in a sealed

tube for 1s. 8d. The little pamphlet, whose title is given at the heading of this notice, is a neat specimen of the typographic art, and the cover is effectively and strikingly bordered in green and gold. In the course of the sixteen pages the reader is told in simple terms how to make prints on Platona paper. There is not a superfluous word in these simply written instructions, which are so much to the point that the photographer who finds any difficulty in following them must be past praying for. We note that the few formulae mentioned are given in metric as well as Imperial equivalents. This is what the instructions say regarding the kind of negatives suitable for platinum printing. Whole pages have from time to time been written on a subject which is here well condensed into half a dozen lines:—

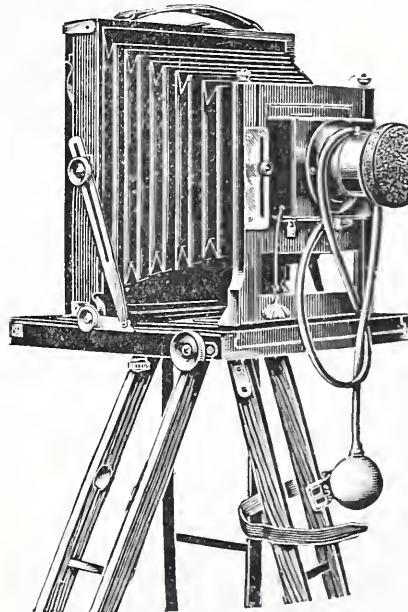
"The negatives used for Platona printing must be of good quality, with a fair degree of opacity, and good, but not excessive, contrasts. Thin and flat negatives will not yield good prints on any kind of platinum paper. On the other hand, no special type of negative is needed for the process, provided that they are reasonably good, and negatives that will give really good prints on P.O.P. will also give first-rate prints on Platona paper if properly printed. Negatives with very strong contrasts, from which it is difficult to obtain satisfactory prints by any other process, will often yield useful results on Platona paper, especially if printed in sunlight."

By the way, the Britannia Works Company ask us to contradict a statement which has been made that Platona paper is not a true platinum paper. Of course, it is nothing else but a platinum paper.

THE HALF-PLATE "APEK" SET.

Manufacturer : Wilfred Emery, 3, Soho-street, W. (and Brondesbury).

THE illustration will convey to the intelligent reader an idea of the principal characteristics of this set of apparatus, which, from personal examination, we can certify to be well made throughout and good value for the money. Here are its "leading features:" The camera has reversing frame, leather bellows, swing back, rising front, double



extension wide-angle movement (giving a focal range of from five to fifteen and a half inches), book-form slide, folding shutters. The lens is a rapid rectilinear with iris diaphragm, the shutter a Thornton-Pickard with pneumatic release, and the threefold tripod has a turntable top. A special feature is the brass turntable with sunk screw, enabling the camera to be used on a table or studio stand, without any wobbling, for copying, &c.

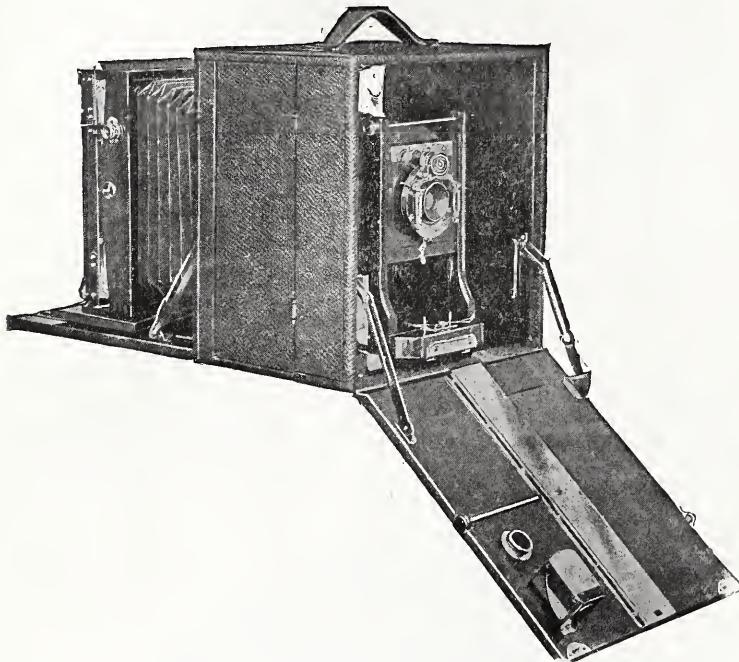
THE MANHATTAN OPTICAL COMPANY'S CAMERAS.

British Agents : Seabrook Bros. & Co., Edmunds-place, Aldersgate-street, E.C. A CAREFUL examination of a number of the Manhattan Optical Company's cameras, which were recently submitted to us, apprises us that those instruments possess the best features of American manufacture. Mechanically regarded, they are well finished, are compact and portable, and are capable of producing excellent photographs in the hands of those taking up glass-plate photography, in the hand or on a stand. We select three typical cameras from the series for descriptive mention.

THE LONG-FOCUS WIDE-ANGLE WIZARD.—The box is of back and front focus type, this giving a very long bellows. Both the front and back focal adjustments work with great smoothness, the front being provided with a rack and pinion, which permits of fine focussing. The movements in the rising, sliding, and falling fronts are all of great range. The reversible back enables one to make either vertical or horizontal pictures without changing the position of the camera, and is of the double swing type. The horizontal swing is controlled by a worm screw. The

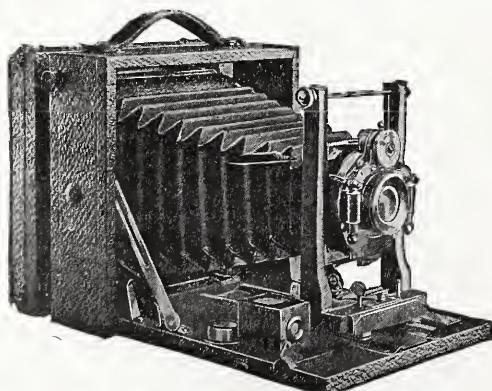
ground-glass frame is spring-actuated, adjusted to the true focal plane, and can be removed when the roll-holder is to be used. On the front bed are a view-finder and spirit-level. When it is desired to use only the front focus, the back bed is dropped as shown, the plate-holder being inserted and the slide removed, through either the side door for horizontal, or the top door for vertical, views. The length of bellows makes the instrument adapted for copying and tele-photo work. When the wide-angle lens is used, the front bed is dropped below the horizontal as shown, and the back focal adjustment is employed.

The box is made of polished mahogany, and covered with black seal grain cowhide; the handle is of sole leather. The metal fittings are finished in nickel. Pressure on the hidden buttons provided for the



purpose causes the beds and doors to open automatically. The long-focus Wizard has a carrying capacity of three double holders, as well as a carrying case for two holders, which fits into the back of the camera.

THE LONG-FOCUS CYCLE WIZARD.—The long-focus cycle Wizard occupies the same position in the Company's cycle series as the long-focus Wizard does in the box series, being very compact, and combining all the movements and adjustments which it is possible to introduce in this construction. The box is made from polished mahogany, covered with seal grain leather, and provided with a sole-leather handle. The bellows is of red leather, and all metal parts, with the exception of the shutter, are finished in nickel. Pressure on a hidden spring causes the bed to drop, and the front can then be drawn out and clamped to the track for focussing. A rack and pinion is provided for delicate adjustment of the focus, and is also used to rack out the extension bed for



long-focus work. In this box will be found a long bellows for various sizes. The ground-glass frame is spring-actuated, receding when the holder is inserted. The reversible swing back works at centres, and enables one to take either horizontal or vertical views without changing the position of the camera. Each box is provided with a view-finder, spirit-level, and tripod socket. In addition to one plate-holder, a black or tan sole leather or leather-covered carrying case for the camera and five holders, fitted with a nickelled spring lock and shoulder or bicycle strap, is included.

A less expensive form of camera is the Wizard A, the box of which is made of mahogany, hand-polished, and covered with black seal grain. The handle is of sole leather. The bellows is of red leather, and there are nickelled metal fittings. As in the other cameras, the bed is lowered by pressure on a hidden button, and the front, after being drawn out to the

required point, is clamped to the track by a turn of the lever under the front board. The latter has a rising and falling movement. The ground glass frame is spring-actuated, and can be removed when a roll-holder is to be used. The bed and the focussing and side doors open automatically when the hidden buttons are pressed. Each camera is provided with reversible finder and two tripod sockets. The Wizard A has three plate-holders.

SELL'S DICTIONARY OF THE WORLD'S PRESS.

Published by Sell's Advertising Agency, Ltd., 167, Fleet-street, E.C.

This is a wonderful book. What it does not tell one about the world newspapers can scarcely be worth knowing. There are over 200 pages of articles on the always attractive subject of journalism and its ramifications, and the dictionary proper takes up another thousand pages or so. The volume is full of interest to those whose business brings them in touch with the press, while even that mysterious person, "the man in the street," could not fail to find something of a readable and informative nature in Mr. Sell's mammoth production. In a note touching upon some of the main features of the dictionary, Mr. Sell says: "I have this year had the book printed on a special paper, and have also reset the magazine lists in two columns, and have thus reduced the bulk of the book, although the matter contained is far more than hitherto. Just at this period the views of the representatives of our great colonies, and the particulars as to how their interests are promoted in the United Kingdom are, I think you will believe, of great interest. All the newspaper and magazine lists have been thoroughly revised and brought up to date and, in addition to the maps of the counties of England and Wales, &c. I have this year added maps of the less known parts of the world in connexion with the Colonial lists. It will interest you to know that the number of newspapers published in the British Isles is 2473 (London, 521 Provincial, 1952). In addition to the newspapers there are altogether 1685 magazines and 684 quarterly reviews published in Great Britain and Ireland." The book is well worth the 7s. 6d. charged for it.

VIGNETTES AND BORDER NEGATIVES.

Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

FROM Mr. Welford we have received samples of his "Easy Vignette," "Straight-edge Vignette," and "Artistic" border negatives; all these are made on films. The first-named are designed to obviate the harsh effects of other vignetting mediums, without recourse to cotton wool, shading, bending of edges, &c. Being perfectly gradated from transparency to opacity, they may be used close to the negative.

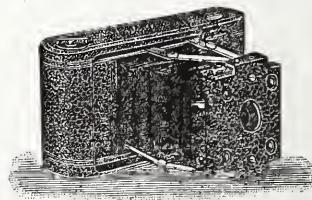
With the Straight-edge Vignette the result is a plain, straight, gradated effect across the film or plate, at different heights, to suit varying subjects. It does away with blocking or shading in combination printing either when printing the foreground or the cloud, and it can also be used for shading the weak parts of a negative.

In the Artistic border negatives the space for the photograph is quite opaque, giving a clear white upon the print, into which it is easy to vignette or print a portrait or landscape. Some effective designs are included in the latter series, which, together with the vignettes above referred to, should be found of very great use in the niceties of photographic printing.

THE No. 1A FOLDING POCKET KODAK.

Manufactured by Kodak, Ltd., 43, Clerkenwell-road, E.C.

AN addition has been made to the popular and convenient series of folding pocket Kodaks in the shape of the No. 1a Folding Pocket Kodak which takes a film $4\frac{1}{4} \times 2\frac{1}{4}$ inches, thus giving a picture of pleasing proportions. The new Kodak, as will be seen from the electro herewith,



of the usual folding pocket type, opening and closing with one rapid simple movement. It has an ever-set shutter, and separate levers for time and instantaneous exposures, while a third lever actuates a set of three stops. The dimensions of the No. 1a Folding Pocket Camera are: 8 inches long, $3\frac{1}{2}$ inches wide, and $1\frac{1}{4}$ inches thick when closed. It takes spools of daylight films for twelve exposures and for six exposures. The new Kodak sells at 2l. 10s., and the extremely pleasing proportions of the size of picture it takes should ensure it very great success amongst the trade and photographers.

Studio Gossip.

IT is stated that Lord Monkswell hopes to introduce the new Copyright Bill in the House of Lords during the present session. It follows the recent inquiry which has been made regarding the whole subject. A daily contemporary is of opinion that the best description of it would probably be this—a measure codifying English copyright law, and giving effect to such new conditions as may be thought advisable.

News and Notes.

MR. JOHN H. GEAR, F.R.P.S., is giving a course of twelve lessons on bromide enlarging, carbon and combination printing, and lantern slides, at the Cripplegate Institute, on Tuesdays, at eight o'clock. Further particulars can be obtained from the Manager, Cripplegate Institute, Goldenane, E.C.

THERE will be a meeting of the National Photographic Record Association at the Midland Grand Hotel, St. Pancras, on Tuesday, 27th inst., at four o'clock, to receive a report of the work already accomplished, and for having a discussion as to the best means of increasing the usefulness of the Association. Some recent contributions will be laid upon the table.

ROYAL PHOTOGRAPHIC SOCIETY.—February 27 (Tuesday), at eight p.m., at 36, Russell-square, "Electricity in Connexion with Photographic Action," by Mr. W. Friese-Greene. We are asked to state that Mr. J. Craig Annan's Exhibition will close on Wednesday, February 28. The March Exhibition will be provided by the National Photographic Record Association, and will be opened at eight p.m. on Wednesday, March 7, by Sir Benjamin Stone, M.P.

PHOTOGRAPHIC SECTION, G.E.R. MECHANICS' INSTITUTION, STRATFORD, E.—The Seventh Annual Photographic Exhibition will be held at the Institution, Store-street, Stratford, on Tuesday and Wednesday, March 13 and 14. There will be cinematograph displays each evening at 8.15 p.m., lantern shows at 9.15 p.m., vocal and instrumental music at intervals, and photo-chromoscope and other photographic attractions. The Exhibition will be opened on Tuesday evening, March 13, at 7.30 p.m., by Mr. Horace Wilmer, F.R.P.S. We may remind interesting exhibitors that one silver and two bronze medals are offered for competition in the open class, and that entry forms should reach the Hon. Secretary not later than Monday, March 5.

WE have seldom been present at a more enjoyable entertainment of the kind than the Fifth Annual Bohemian Concert held by the employees of Messrs. Fallowfield at the Champion Hotel, Aldersgate-street, on Friday evening, February 16. Mr. F. W. Hindley presided over a large gathering, or whose amusement a capital programme of songs, sketches, and instrumental music had been provided. Mr. C. E. Johnson was an excellent pianist, and particular praise must be awarded to the contributions of Miss Marie Kehrein, Miss Milbanke, Mr. Owen Way, Mr. John Probert, Mr. Carl Brandt, Mr. Tom Day, Mr. Aubrey Wills, Mr. Louis Mackenzie, and Messrs. Quinton and Guernsey. Master H. J. White sang "The Absent-minded Beggar" with first-rate effect, and the usual tambourine collection resulted in the addition of a sum of 4*l*. 2*s*. to the *Daily Mail* Fund. Mr. H. J. White was in the vice-chair. The courteous Committee consisted of Messrs. J. T. Craig, H. W. Fellows, W. C. Hardman, and J. C. Preece, the Hon. Secretary being Mr. F. J. Goode, who was as hard-working and attentive as ever. A vote of thanks was passed to the Chairman for presiding, and the most successful concert yet held by Messrs. Fallowfield's employees terminated to the great satisfaction and enjoyment of all concerned.

Commercial Intelligence.

MESSRS. R. & J. BECK, of 68, Cornhill, E.C., are now supplying the No. 00 Frena camera covered with khaki at 3*l*. 12*s*., including forty celluloid films. Messrs. Beck are also exhibiting in their window a Frena enlargement of a 7-inch naval gun on trolley landed at Durban, and now in use at Ladysmith.

MARION'S ANNUAL STOCK-TAKING SALE.—Last week, owing to the information reaching us at the moment of going to press, we could only make a very brief reference to Messrs. Marion's Annual Stock-taking Sale, an event always of the greatest interest to photographers and the trade. The Sale will be held from March 5 to 17. Catalogues, with description of clearance lines from all departments, photographic and fancy, will be ready about March 1, and will be sent post free on application.

DR. CARL SCHLEUSSNER, one of Germany's most prominent theoretical and practical workers in the different branches of photography since its early days, died recently at Frankfort-on-the-Main, at the age of seventy years. He had a large laboratory for the manufacture of chemicals, particularly collodion and nitrate of silver, but he was more extensively known by his dry plates, which enjoy a high reputation in Germany. For many years he was President of the Verein zur Pflege der Photographie at Frankfort.

MR. A. C. BALDWIN, of the Paget Prize Plate Company, writes us: "Will you kindly allow me, through the medium of your columns, to tender my apologies to the members of the following societies, Bolton, Ashton-under-Lyne, Leigh, Bootle, for not appearing to give my demonstration on Gravura? Unfortunately influenza has claimed me, and the doctor forbids my going out. I am just on the point of concluding a most successful tour, and this is the inglorious manner in which I, perforce, must finish it." We wish Mr. Baldwin a speedy recovery from the fashionable ailment.

MESSRS. GAUMONT & CO., of 25, Cecil-court, Charing Cross-road, W.C., inform us that the Prince of Monte Carlo some time since arranged a competition among cinematographers, with the idea of encouraging and developing this branch of photography. The prizes, of which there were eleven, were personally awarded during the last few days by the Prince to the successful competitors at Monaco. Nine of the prizes were obtained by competitors possessing Demeny's Chrono-photograph Machine made by L. Gaumont & Co. The machine is better known in this country under the abbreviated title of "The Chrono."

THE AUSTIN-EDWARDS MONTHLY COMPETITION.—The following is the list of awards in the lantern-slide and film-negative competition for February: lantern-slide competition: 3*l*. cash prize, Mr. J. Gunston, Wimbledon, *The Rifelhorn*; 2*l*. cash prize, Mr. W. M. Dodson, Bettws-y-Coed, *Late Autumn*; 1*l*. cash prizes, Mr. E. R. Bull, Forest Hill, *Panel*, St. George's Chapel, Windsor; Mr. J. A. Wilson, Liverpool, *A Winter Afternoon*; Mr. P. H.

Grandin, Jersey, *Portrait of General Don, Governor of Jersey, 1806*; Rev. E. Healy, Leamington, *Return from Market, Interlaken*; Mr. G. H. Schafer, Balham, *Summer Sunshine*. Film-negative Competition: The Frena camera given each month for the best negative on an Austin-Edwards film has been secured by Mr. V. Thompson, Wellingborough, for his negative *Ornamental Gates of Castle Ashby Norths*.

Patent News.

THE following applications for Patents were made between February 5 and February 10, 1900:—

OXYGEN.—No. 2232. "Improvements in the Manufacture of Oxygen." J. BILBIE and J. A. WANKLYN.

ANIMATED PHOTOGRAPHS.—No. 2233. "Apparatus for Use in Taking, Printing, and Exhibiting what are known as Animated Photographs." E. L. DOYEN.

ANIMATED PHOTOGRAPHS.—No. 2234. "Apparatus for Perforating, more especially intended for Perforating Cinematograph Photographic Bands of Film." E. L. DOYEN.

ANIMATED PHOTOGRAPHS.—No. 2235. "Improvements in Apparatus for Taking and Exhibiting or Viewing what are known as Animated Pictures, and other Pictures or Representations." E. L. DOYEN.

SENSITISED PAPER.—No. 2237. "Improvements in Sensitised Paper for Photographic Printing." Communicated by R. B. West. Complete specification. H. H. LAKE.

CAMERAS.—No. 2624. "Improvements in or relating to Photographic Cameras." THE BRITANNIA WORKS COMPANY, LTD., A. C. SMITH, and A. A. SMITH.

X-RAY APPARATUS.—No. 2638. "Improvements in Röntgen-ray Apparatus and in Interruptors applicable for use in connexion therewith, or for other purposes." J. M. DAVIDSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
26-Mar. 3	Birmingham Photo. Society ..	Annual Exhibition.
26.....	Bradford Photo. Society ..	{ Yorkshire Photographic Union, No. 2 Loan Collection Lantern Slides.
26.....	Derby	{ Demonstration: <i>Gravura Products</i> . Mr. Hackett.
26.....	Kingston-on-Thames	Rejlander, his Life and Work. A. H. Wall.
27.....	Ashton-under-Lyne.....	Lecture by Tulloch Cheyne.
27.....	Bootle	Prize Slides.
27.....	Camera Clnb.....	Club Hons. Dinner.
27.....	Isle of Thanet	{ Plates and Paners for Pictorial Work. A. Horsley Hinton.
27.....	Leeds Photo. Society	Vesuvius. Tempest Anderson, M.D., J.P.
27.....	Royal Photographic Society ..	{ Electricity in Connexion with Photographic Action. W. Friese-Greene.
27.....	Whitby	Prize Slides.
28.....	Borough Polytechnic	Lantern Night.
28.....	Croydon Camera Club	Lantern Night.
28.....	Photographic Club	{ Exhibition of Prints by the Photographic Record Association, and Slides by Sir Benjamin Stone, M.P.
March.		{ Old Walled Towns and Fortifications chiefly in and around Tuscany. John Chester.
1.....	Camera Clnb	Mistakes. M. F. Burrows, J.P. An Alpine Borderland. J. W. Wade.
1.....	Leigh	Paper by S. Herbert Fry.
1.....	Liverpool Amateur	Negative Development. R. T. Taylor.
1.....	London and Provincial	Paper by J. H. Gardner.
1.....	Oldham	Portraiture. Harold Baker.
1.....	Röntgen Society	Practical Evening: Cloud Negatives.
1.....	Tunbridge Wells	{ Technical Control of Pictorial Results. W. Thomas.
2.....	Borongh Polytechnic	Beginners' Meeting: Printing. George Lamley.
2.....	Croydon Microscopical	Eleventh Annual Exhibition.
2-10	West London	
3-10	South London	

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 20.—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

THE RETIRING PRESIDENT.

At the opening of the meeting, the President alluded in terms of the highest appreciation to the very valuable services which had been rendered to the Society by the Earl of Crawford, his distinguished predecessor in the chair, and at his instance a most cordial vote of thanks was accorded, with acclamation, to his lordship in recognition thereof.

Professor R. W. Wood, of Wisconsin University, gave a most interesting lecture upon the subject of his researches in three directions. In the first place he dealt with

ZONE-PLATE PHOTOGRAPHY.

The zone-plate is made by drawing on a large sheet of paper a number of concentric circles, forming a black and white target with rings decreasing in width as the distance from the centre is increased, making a reduced negative of the target, and then a transparent positive on a glass plate—about the size of a shilling—coated with bichromated gelatine. Professor Wood said he had made a small telescope with a zone plate in lieu of an object-glass, and it would show, although not very distinctly, some of the larger volcanic craters on the moon; and he exhibited two lantern slides from negatives taken in a camera, with a zone plate instead of a lens. A peculiarity which it possessed

was that it had three or four different foci, and in its action it differed both from a lens and a pinhole in that it gave a fairly sharply defined image which had superposed upon it the blurred image due to its multiple focus. The exposures were about half a second, with a rapid plate.

PHOTOGRAPHY OF SOUND WAVES.

PROFESSOR WOOD next showed a series of photographs of sound waves, which he had made quite recently, the sound being that of an electric spark. He explained that the time of exposure must be so short that the wave will not move any appreciable distance, and that the exposure must be made at just the moment when the wave of sound is in the field, and he drew a diagram showing how he had fulfilled these conditions by starting the wave with one electric spark, and then illuminating and photographing it by a second spark caused by the first, behind which it lagged just long enough to allow the wave to get fairly started. He exhibited many slides showing the behaviour of sound waves under different circumstances, and dealt very fully with the subject and with the methods and apparatus which he had adopted for securing the photographs.

DIFFRACTION-GRATING COLOUR PHOTOGRAPHY.

The final division of Professor Wood's address was devoted to his process of diffraction-grating colour photography, the main features of which have already been detailed in THE BRITISH JOURNAL OF PHOTOGRAPHY, and particularly in the ALMANAC for 1900 (p. 830), and the principle of which was simply summarised in Ex Cathedra last week. About a dozen of the lecturer's results were exhibited in the Council Room, with the necessary viewing instruments, and they were examined with much interest both before and after the lecture by the large number of members and visitors who were present.

The PRESIDENT referred to the researches of Du Hauron and Joly in three-colour heliochromy, and to Professor Lippmann's process of interference colour photography. The latter, he said, was a physicist's work, founded entirely on theory, and Professor Wood had followed with a similar highly scientific achievement. He asked whether there was any limit to the reproduction of diffraction gratings by means of bichromated gelatine, so far as the number of lines to the inch was concerned.

Professor Wood said he had made satisfactory copies of gratings with 14,000 lines to the inch.

Mr. DANDO showed a copy of a 14,000 line grating, made by Mr. Thorpe, of Manchester.

Professor WOOD remarked that the problem had been attacked in a very ingenious manner by Mr. Thorpe, who had devised a means of working with only one grating.

Mr. E. J. WALL, after complimenting the lecturer on the extremely valuable and lucid nature of his communication, referred to the colour photographs which were exhibited, and said that, although they showed brilliant spectrum reds, blues, and greens, he had been unable to detect any half-tones or gradations of colour. He asked whether this might not be due to the fact that the rulings of the gratings—which were respectively 2000, 2400, 2750 lines to the inch—were a little too far apart, and also whether this lack of intermediate colours arose simply from the negative or was inherent in the process. He had made some experiments with the method, and had met with the same difficulty himself. He also asked for information as to the proper thickness of the film of bichromated gelatine employed for printing and the strength of the solution.

Professor Wood admitted that the lack of intermediate shades of colour was at present the great drawback to the process, but it was not inherent in the theory; it was caused by the mechanical difficulties in printing diffraction gratings, and these would be overcome. The gelatine solution was made by dissolving 5 grammes of Nelson's photographic gelatine in from 125 to 150 c.c. of water, and adding 6 or 8 c.c. of a saturated solution of bichromate of potash; a clean glass plate was coated, and drained until the drops falling from the edge fell every two or three seconds, when the plate was levelled and dried.

COMING EVENTS.

February 27, "Electricity in Connexion with Photographic Action," by Mr. Friese-Greene. March 6, Lantern Evening, "Some Beauty-spots of English Scenery," by Mr. J. A. Hodges. On March 7, Sir Benjamin Stone, M.P., will open an Exhibition of work contributed by the National Photographic Record Association. He will give an introductory address at eight p.m., and the Exhibition will continue during the remainder of the month.

Croydon Camera Club.—February 14, Tenth Annual Meeting.—From the statement made by the PRESIDENT it would appear that the Club has passed through one of the most successful of its years. Forty evening meetings have been held, when special programmes have been provided. At these the attendances, excluding public lantern shows, when the audiences ran into hundreds, averaged thirty per meeting. The third Exhibition held at the Art Gallery proved in every way successful, the accounts showing a profit to the Club, while the total attendance is calculated to have been over a thousand. It was unanimously decided that in future the Exhibition should be held annually during February, the next one to be in February, 1901. The roll of members is larger than ever. There are no outstanding liabilities, while on the other hand a considerable amount of cash and property represents the assets. The following were appointed to act as officers and Council:—
President: Mr. Hector Maclean, F.R.P.S., F.C.S.—**Vice-Presidents:** The Mayor of Croydon (Councillor N. Page), Sir David Salomons, Bart., The Right Hon. C. T. Ritchie, M.P., Sir Frederick Edridge, J.P., Mr. James Glaisher, F.R.S., and Alderman G. G. Allen, J.P.—**Council:** Messrs. Isaac, Jenkins, Noaks, Packham, Wratten, Irving, Chadwick Taylor, Willcocks, Ben. E. Edwards, W. H. Smith, Stanley, and Jeffery, of whom the last four named are fresh blood.—**Hon. Lanternist:** Mr. A. E. Isaac.—**Hon. Treasurer:** Mr. H. E. Holland, 69, Lansdowne-road, to whom, in future, all subscriptions should be forwarded direct.—**Hon. Secretary:** Mr. W. H. Rogers, 46, Bensham Manor-road, Thornton Heath. Amongst other matters of interest, it was decided to hold the annual dinner about the last week in March. It was

resolved that on March 14 a grand special lantern entertainment in the Large Public Hall be held, in aid of the war fund for the widows and orphans. The PRESIDENT, in pressing the matter forward, reminded those present that at a moment when the empire was passing—he ventured to hope safely—through a crisis, the like of which, he trusted, would not recur, those who were obliged to stay at home should not count their coppers nor spare their shillings, but strain every nerve, not only to help provide for those who become needy through the loss or disablement of the bread-winner, but also see to it that the spirit and ardour of their neighbours were not allowed to flag. With much more to the same end, Mr. Maclean asked the meeting not merely to approve the project, but to also resolve that they individually would make it a great and striking success.

Richmond Camera Club.—At the meeting on the 5th inst., to which ladies were invited, a lecture entitled

ATHENS TO OLYMPIA

was given by Mr. A. VANDERDRIESCHE, of the Kingston Photographic Society. Notwithstanding the bad weather, there was a good attendance.

At the meeting on the 12th inst., Mr. G. McK. MUNRO gave a paper on

ANIMATED PHOTOGRAPHY FOR AMATEURS,

illustrated practically by the Biokam. Mr. Munro commenced by giving a short history of animated photography, and then he showed fully the working of the Biokam (which is about the size of a small hand camera) by means of an admirable set of lantern slides. He then showed the method of developing the negative film and printing positives therefrom, and concluded by showing a large number of living photographs, in which the absence of flickering was particularly noticeable. Mr. Munro was most efficiently assisted in his lecture and demonstration by Mr. Coysy.

Southsea Amateur Photographic Society.—February 8, the Twelfth Annual General Meeting, Mr. H. T. Lilley, M.A. (President), in the chair.—The HON. SECRETARY (Mr. F. J. Mortimer), in submitting his report on the year, congratulated the Society upon its sound position both as to its sphere of usefulness and popularity, and more particularly financially. The Society was steadily progressing, and the standard of work amongst the members had risen much higher than in any previous years, and signs were not wanting of a still greater advance in the future. The membership had increased twofold, and the sustained interest taken in the Society's affairs was largely to be attributed to the introduction of this newer blood, which was eminently desirable as maintaining the vigour of the Society, and imparting to its proceedings that liveliness which was the surest sign of health and the best basis of success. The expenses during the year had been heavy, but the Treasurer's report would show that the Society was never in a sounder financial position than at present, and there was a substantial balance in hand. The demonstrations and lectures had been well attended, and the lantern nights had become more numerous and interesting. The Society continued affiliated to the Royal Photographic Society, and made full use of all the advantages the parent Society offered. The outings during the year had been successful, more particularly those not prearranged, and it was thought advisable during the coming year to aim chiefly at a series of small parties under the leadership of some member chosen for each occasion at the time. The fine rooms of the Society in Pembroke-road, Portsmouth, had been entirely renovated, and the upper stories rebuilt, and increased facilities were offered to the members, as, in addition to the rooms for the use of members and the library, which now included most of the standard works on the art, as well as all the periodicals, there was also a completely fitted developing room and daylight enlarging apparatus. Since its foundation in 1888, the Society had steadily increased in importance, and, at the successful Exhibition held in Janunry, the Judges (Messrs. H. Snowden Ward, G. West, and H. Symonds) had expressed the opinion that the Society would now compare favourably with any other provincial society. That the Society was capable of doing good in other directions was evidenced by the success of the Dickens' Land lecture by Mr. H. Snowden Ward. This lecture, given at the Town Hall in December last, and organized entirely by the Society, enabled 45L. to be handed over to the War Fund for the relief of the dependants of the "gentlemen in khaki" now fighting in South Africa. The TREASURER then submitted his report, which was highly satisfactory, showing a good balance in hand. The accounts were passed, and the HON. SECRETARY then read a balance-sheet of the Exhibition, which showed that, as a result, a sum nearly equal to the entire balance of the Society would be handed over, the Society thus entering on the thirteenth year of its existence with the rosiest of prospects. The officers for the year were then elected as follows:—**President:** Mr. H. T. Lilly, M.A. (re-elected).—**Vice-President:** Dr. C. H. Newby.—**Council:** Colonel H. W. B. Bruno, Dr. F. Lord, Messrs. G. Whitefield, E. H. Purvis, H. Canning, and P. Denham.—**Treasurer:** Mr. F. G. Lewis.—**Hon. Secretary:** Mr. F. J. Mortimer.—**Assistant Hon. Secretary:** Mr. F. O. Field. Mr. Luther Dyer was appointed Hon. Lanternist to the Society. It was resolved to hold meetings at the rooms on Mondays and Fridays in addition to the usual Wednesday meetings, and it was proposed to form a ladies' section, and a Committee was appointed to consider the details.

FORTHCOMING EXHIBITIONS.

1900.

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|-----------------------|--|
| February 23, 24 | Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh. |
| " 24-March 3 | Birmingham Photographic Society. Lewis Lloyd, The Hollies, Church-road, Moseley. |
| March 3-10 | South London Photographic Society. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh Hill, Blackheath, S.E. |
| " 13, 14 | G.E.R. Mechanics Institution (Photographic Section). C. W. Harris, 294, Cam Hall-road, Leytonstone, E. |

- March 26 Twentieth Century International, Birmingham.
Walter D. Welford, 19, Southampton-buildings,
Chancery-lane, London, W.C.
,, 26-31 Photographic Society of Ireland. W. F. Cooper,
35, Dawson-street, Dublin.
April 3-7 Birkenhead International. C. F. Inston, 25, South
John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

PORTABLE STUDIOS.

To the Editors.

GENTLEMEN,—Reading THE BRITISH JOURNAL OF PHOTOGRAPHY, February 2, 1900, I see in Answers to Correspondents that M. E. Bradford asks for information about "Herr Schaetzer's portable studio."

I therefore beg to inform you that the portable studio in question has been invented and is made by Herr Felix Schaetzke (not Schaetzer), photographer, of Bochum, Germany, who has applied for patents in Germany and thirteen other States. It is a flashlight studio, but may be equally well used as a daylight studio with a very perfect lighting arrangement. It may be erected in every studio and in every room, and can be removed within fifteen minutes. Its price is 750 marks. The portraits and groups taken in this studio, and which I have seen, were of a very remarkable good lighting, and made not at all the impression of flashlight pictures.

All further particulars may be obtained at the under-mentioned address.

—I am, yours, &c., HERMANN SCHNAUSS, Editor "Apollo."
"Apollo" Redaction, Dresden, February 14, 1900.

TYLAR'S "TIT-BIT" HANDICAP FOR THE "ABSENT-MINDED BEGGARS' FUND."

To the Editors.

GENTLEMEN,—I should like to jog the memory of your readers who have not already sent their shillings, and a stamped directed envelope, to secure a ticket in the distribution of twelve "Tit-Bit" hand cameras, which I offered for the purpose of raising a fund to supply requisites for the use of Dr. Hall-Edwards in connexion with his work at the seat of war. The latest date I can receive contributions is February 26. Up to date, February 15, 1900, I have received 297 shillings; this gives an average of one chance to about each twenty-four competitors.

Messrs. Lennon & Co., of London and Cape Town, have kindly offered to deliver the case of goods to Dr. Hall-Edwards free of charge. Now, you professionals, spare five minutes and rush off to get those stamps, and send your shilling and a stamped addressed envelope to me at once, as I am anxious the photographers of England should show their brethren at the front that they are not forgotten.—I am, yours, &c.,

W. TYLAR.

High-street, Aston, Birmingham, February 15, 1900.

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Being a subscriber of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, and more than amateur in stereoscopic photography, I take leave in asking you a favour. Could you kindly give me the address of sellers or loaners, single or in series, stereoscopic glass transparencies or prints on paper of foreign countries. Having reawakened the interest of the Bohemians for stereoscopy, a friend of mine mounted two panoramas at Austria, where my pictures from my last travels through Asia and Indo-Australia are exposed. It has met with such success that the public have a strong desire to see more.

The object is wholly educational, and therefore my friend asked me to inquire whether it is possible to obtain views from the English colonies, South Africa mostly desired. Thanking you for your future services, and at all times at your service,—I am, yours, &c.,

E. St. VÍRÁZ, Scientific Explorer.
150, West 12th Street, Chicago, Ill., February 8, 1900.

[Messrs. Lévy, of Rue Louis Le Grand, Paris, supply stereoscopic transparencies. Amongst the firms who make a speciality of stereoscopic slides may be mentioned Messrs. Underwood & Underwood, 26, Red Lion-square, London; Messrs. Seaman & Sons, Chesterfield; Mr. W. Tylar, High-street, Aston, Birmingham; Messrs. Catherall & Prichard, 326 Camden-road, London, N.W. Perhaps the firms named will send our correspondent their catalogues.—EDS.]

To the Editors.

GENTLEMEN,—I beg to enclose a few stereoscopic prints as a token of my appreciation and enjoyment of your interesting article in the ANNUAL.

The tenth section of your article was of special interest, as it shows me that what I have hitherto regarded as an original idea of my own is already in use. I refer to the illustration of books by stereographs, for the benefit of those who possess the faculty of focussing, by acquired control of the eye muscles, without the use of a glass.

I have never seen a book illustrated in that way, and have intended for years to make an attempt to produce one.

If you will kindly refer me to the publishers of any such books, I should esteem it a great favour.

One single point occurs to me, which possibly may have escaped your attention, in connexion with focussing with the eyes alone, which, in my own practice, I have found of great value. In taking the picture, when focussing on the ground glass, to reverse the process employed with prints, which, being transposed, need to be viewed axially, and instead, getting the stereoscopic effect on the ground glass of the camera itself by "squinting" at the unreversed pair of images. Again thanking you for your able article, I am, yours, &c.,

OREGON.

[We thank our correspondent, who also writes from the United States, for the interesting series of stereoscopic pictures he is good enough to send us. It is a pleasure to us to know that so much interest is taken in stereoscopic photography by our American brethren, and we are always glad to answer questions on the subject. Messrs. C. Arthur Pearson, Limited, of Henrietta-street, London, publish a book illustrated with stereoscopic views. It is termed *Impressions of America*, and is by Mr. T. C. Porter, M.A., a well-known amateur photographer and President of the Eton College Photographic Society. The price is 10s. 6d. With regard to viewing the image on the ground glass stereoscopically, this is done by crossing the axes. We have heard of persons possessing this power; but we imagine it is exercised at the risk of contracting some form of strabismus, or permanent squinting.]—EDS.

THE CAMERA IN THE CAMP.

To the Editors.

GENTLEMEN,—Your correspondent, "J. F. T.", in his attempt to belittle the utility of photography as an aid in military operations, has adopted controversial methods which are more time-honoured than convincing. Thus, he asserts that the camera will not do things that I have not in my article claimed for it; he also suggests that I should try the experiment myself, failing which I should, inferentially, hold my peace.

Again: He states, "To expect that men . . . should carry in their heads a complete knowledge of the topography of a country from hearing a few lectures is absurd." Certainly; but not much more absurd than being content with complete ignorance.

If plan and sketch are found best, by all means use them; but they were in Buller's case not available, while, as indicated in my article, photographs might have been obtained. In such a climate a horseman might cover twenty or twenty-five miles a day, and, by means of a hand camera, obtain some fifty photographic notes far more full of possibilities of useful information than are included in sketches and plans taken at the same rate. To be sure, route surveys and sketch plans will have a value all their own, particularly where the man who makes the plan has a definite object in view—i.e., to locate positions for guns, or indicate river fords, &c.; but where general, as distinct from particular, information is required, despite "J. F. T.'s" letter, I remain of the opinion that, properly used, the camera is an easy first as a reader of topography.

It is so quick in gathering its information, which is only accurate in outline, but exceedingly comprehensive in character.

Having during the past ten years presided over more than a hundred lantern shows, I am able from personal experience to speak of the great educating power of the photograph shown on the screen. Certain parts of England, and of Europe, have, by means of repeated displays of sets of slides illustrating the districts in question, been so strongly impressed upon my mind, that I seem to know these regions in some respects probably better than do half the people who live amongst the scenes referred to.

And to-day "the man in the street" pictures in his mind—sometimes very vividly and accurately—the physical aspects of South Africa entirely by means of, generally, smudgy process blocks reproduced from negatives which oftentimes have been either hastily or unskillfully taken. If under such happy-go-lucky circumstances, without special skill or system, so much may be imparted, how much more could be taught by the methods advocated in my article!

We have been out-classed in big guns, and yet would not have "Pom-poms." We lack maps, and yet scorn photography. This attitude may be wise, but such is not the opinion of yours, &c.,

Croydon, February 17, 1900.

HECTOR MACLEAN.

NATIONAL PHOTOGRAPHIC RECORD'S EXHIBITION AT THE PHOTOGRAPHIC CLUB.

To the Editors.

GENTLEMEN,—I have to inform you that on 28th inst., at this Club's meeting at Anderton's Hotel, an Exhibition of Prints by the Photo-

graphic Record Association, will be held, and a number of lantern slides, illustrating the same subject, by Sir J. Benjamin Stone, M.P., will be shown.

Members of photographic societies generally, and all interested in the object of the Association, are invited, and will be cordially welcomed by the Club on the occasion, when it is hoped that parliamentary engagements will permit Sir J. Benjamin Stone to attend.—I am, yours, &c.,

W. R. STRETTON, Hon. Sec. and Treasurer.

4, Queen-street-place, London, E.C., February 17, 1900.

NEGATIVES BY POST.

To the Editors.

GENTLEMEN,—In this week's JOURNAL I observe a letter respecting some prints lost in the post, the writer insinuating that they had never been despatched.

I am much surprised you should publish such a letter without knowing further of the matter, as the pointed manner in which it is written leaves little doubt to many people as to whom it refers.

I have proof of delivery of goods to the post-office, who plainly state they give owner compensation for loss or damage.

On receiving notice of prints missing, I advised your correspondent to send in his claims. This he evidently has done, as the only particulars the postal authorities have asked me are the date and place of posting. And yet he asks what course he should take. Does he expect compensation twice?

Out of many hundreds of parcels similarly sent, I have had but one other complaint of contents missing. These were found shortly afterwards loose in the post, as, probably, those of your correspondent have been. In the other case, rather than my customer should be inconvenienced, I sent on a second lot, as I would have done in this case had not Mr. Willatt sent me an abusive letter, stating that he knew they had never been sent.—I am, yours, &c.,

HENRY M. WARD.

41, Belgrave-avenue, Leicester; February 17, 1900.

[With reference to the second paragraph of the above letter, we may point out that the communication we published last week referred to a "photographer in Leicester." Besides Mr. Ward, there are about twenty other photographers in Leicester, hence his theory that we ought to have known that our correspondent referred to him is, to say the least of it, remarkable.—EDS.]

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

E. F. Richards, 12, Victoria-road, Penrith.—Photograph of Captain W. H. Parkin. McLucas & Co., Vaughan-street, Llanelli, South Wales.—Photograph of Mrs. Gwilym Evans.

J. Owen, 49, Broad-street, Newton, North Wales.—Two photographs of groups of S.W.B. Volunteers ordered to South Africa.

R. S.—If you will give us the name of the camera to which the changer is fitted, we may be able to assist you. Without that information it is impossible for us to trace the makers.

PUZZLED.—If the photographs are registered in your late employer's name, the copyright is, *de facto*, his, and you must obtain an assignment of it before you can benefit by it. This is the legal position of affairs.

J. CHATTERELL.—Messrs. Epstein & Co., Bristol; Marion & Co., Soho-square, London; Sichel & Co., Bunhill-row, London, may be able to supply. See the advertisements in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900.

E. C. L.—Paper suitable for the purpose may be obtained from Messrs. Otto König & Co., 27, Cross-street, Finsbury-pavement. With regard to methods of coating, you will gain some useful information from Dr. Just's book on bromide papers, published by Messrs. Percy Lund & Co., Bradford.

STAINED PLATINOTYPES.—ALPHA writes: "What is the cause of the fading of this platinotype? It has not been done a year, and I have several others like it?"—The print has not faded, but the paper has become yellow through the iron not being thoroughly removed when the print was produced.

APPARATUS QUERIES.—C. G. KERR (Edinburgh). 1. We have examined the camera and lens referred to; they will give good results. 2. We have made no tests of comparison, and, if we had, it is strictly against our rule to give such information. 3. We have seen really first-rate results produced with the apparatus named. See also answer to No. 2. 4. Most of the large houses now issue sets of half-plate apparatus ranging in price from 3*l.* to 5*l.*, with which good photographs can be taken. We do not answer questions through the post.

NIGGER and DAVEY have not sent their names and addresses. In every number of this JOURNAL it is stated that "no notice is taken of communications unless the names and addresses of the writers are given." The queries of "Nigger" and "Davey" have therefore gone into our waste-paper basket.

SIZE OF CONDENSER.—W. E. SEARLE writes: "What size condenser must I have for enlarging from seven and a half by five inch negatives, using the limelight?"—A condenser of nine inches diameter will be required. Nine and a half inches would be better if the whole of the subject is to be included in the enlargement.

BOOK ON STUDIO-BUILDING.—E. JONES says: "I want to build a small studio. Will you please tell me of a book (and where I may get it from) that will tell me how to make the studio?"—In reply: *Studio-construction*, by Mr. Thomas Bolas, published by Marion & Co., Soho-square, W. Price (we believe) 2*s.* 6*d.*

COLOUR OF ENLARGEMENT.—H. H. sends a portion of an enlargement on bromide paper, and asks the reason of the heavy cold blacks and absence of detail in the shadows. He adds that the paper is —'s, and that ferrous oxalate is used.—The cause is under-exposure and forced development. The remedy is a much longer exposure. Also see that the temperature of the developer is not below 60° F. while this cold weather lasts.

OIL BUBBLES ON OPALINES.—R. SELLERS asks: "Can you kindly tell me the cause of the small glistening specks on the enclosed opaline? All I mount have them more or less. The one sent is a bad case."—The defects are due to small bubbles of air imprisoned between the photograph and the glass. In mounting, take care there are no air bells in the gelatine, and see that there are none between the print and the glass before the squeegee is applied.

TRICOLOUR.—The plate named should, in accordance with its spectrum sensitiveness, answer for the production of the three negatives. With regard to the screens, if you address Messrs. Penrose & Co., Upper Baker-street, E.C., they may be able to supply you. The work is perfectly possible both by collotype and photo-lithography. On the latter subject, Fritz's book—published by Dawbarn & Ward, 6, Farringdon-avenue, E.C.—is perhaps the best. Write again if we can be of further help.

DAMAGED LENS.—L. E. N. S. says: "I have accidentally dropped my 10 x 8 R.R. lens and it has cracked one of the glasses of the back combination, the other is all right. Can you tell me the cheapest place to get a new glass put in?"—We should recommend you to send the instrument to its maker. By so doing you will ensure the lens being restored to its original quality. That will possibly not be the case if it is put into the hands of another optician, and who probably will have to charge more for the work.

WATER SUPPLY.—AQUA writes: "I have a small private house, in fact, a six-room cottage, in which we do the printing and mounting. The Water Company have given me notice that in future I must pay for the water by the meter, and not as a rate, as hitherto, because I am using it for trade purposes. Can the Company compel this, as it will make a great difference to me, as I leave the prints in running water all night, and that uses a lot?"—The Water Companies can, if the water is used for other than domestic purposes, compel you to pay by meter.

ANXIOUS.—No one book contains all the information you require, but you would gain much assistance from *The Studio and What to Do in it*, by H. P. Robinson, published by Sampson Low & Co., Fetter-lane, E.C. Just's book on bromide printing and enlarging would also be useful. It is published by Percy Lund & Co., Bradford. Our ALMANAC for three or four years would be found of service, as it contains a great many practical hints. With regard to the lens, one of the anastigmatic type, of about sixteen inches focus, would, perhaps, be the most suitable for all-round purposes.

VALIDITY OF PATENT.—X. A. says: "Last year I took out a patent for a piece of photographic apparatus and I wish to sell it. I am now told that the patent is not valid, as two of the five claims in it are for what has been done before. I find, on referring to a back volume of the JOURNAL, that such is the case, but the other three claims are admitted to be original. Will not the three claims to originality sustain the patent?"—No. If one claim is bad, the whole patent is invalid. You can, however, disclaim the two bad claims, then the patent will be valid, that is, supposing the others are for what is original. Better consult a patent agent in the matter.

STUDIO-BUILDING.—J. T. asks: "1. I have built a studio out of an existing building, the roof being all glass. I wish to block out the light on the south side. I have thought of pasting over with brown paper, whitewashing afterwards to make it look presentable. Can you tell me a better method than this? 2. A good substitute for ground glass? 3. What colour curtains do you recommend for studio?"—1. Brown paper will do very well. A little blue added to the whitewash will be an improvement. 2. Fluted glass, if it is intended merely to prevent its being seen through. 3. Pale or dark green, according to the aspect. If that is north, light green will be a good colour.

SUBSTITUTES FOR GROUND GLASS.—C. F. RATCLIFFE asks: "What best can I use as a substitute for ground glass when used for the backing of stereoscopic transparencies? I have used sugar of lead in collodion, giving a kind of opal backing. Is there anything better than this, or is there anything one could stain the transparency film with that would serve the purposes of backing better. I have also used as a backing tracing paper of fine grain, but this is only permissible when there is no sky or clear glass in the transparency."—In reply: An emulsion of oxide of zinc and isinglass has been found satisfactory. Carbonate of lead, trinitrate of bismuth, or alum white, may, we believe, be substituted for the oxide of zinc.

THE BRITISH

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EX CATHEDRÂ.

THE "historic birthplace of artistic copyright," as the Society of Arts was termed by one of the contributors to the discussion which took place there on Wednesday week, after the reading of Mr. Edwin Bale's paper on the subject, was the scene of a meeting which we hope no photographer in these islands will ever forget. It is best at once to be plain-spoken in the matter. The objects of those in whose interests the meeting was called are to secure better protection for copyright in paintings, sculpture, and other works of art, and to rob photography of the rights conferred upon it by the Act of 1862. We are grateful to Sir Henry Wood and the Executive of the Society of Arts for having allowed this meeting to take place, as it gives us the opportunity of again directing the attention of photographers to the fact that their copyright interests are menaced by a number of people who can scarcely be credited with either justice or fairness towards photography; in other words, an attempt is to be made to use the legislature for the purpose of throttling photography once and for all, and thus to prevent it competing in the open market for public patronage with other methods of graphic expression. We say

deliberately that, if the promoters of the Copyright Bill discussed at the Society of Arts the other night get the measure passed in the form it possessed last year, photographic progress will be seriously impeded, and all photographers in the United Kingdom, from the highest to the lowest, will be made to materially and permanently suffer.

* * *

THE right of painters, sculptors, black-and-white workers, and others to seek better protection for their copyright interests, if it be needed, cannot be denied; and, in so far as their demands are reasonable, Mr. Bale and his *protégés* are entitled to public sympathy and support. But how do these gentlemen derive a mandate to propose legislation for copyright in photographs? They have received no such mandate. Their intervention is uncalled for, and is grossly impertinent. Next, who is Mr. Edwin Bale, R.I., that he takes upon himself to define the exact form of copyright protection which photographs should have? Mr. Bale, if we are rightly informed, is Art Director of the publishing firm of Cassell & Co., Limited. We ask photographers all over the country to bear in mind the fact that their copyright interests, as defined by the Act of 1862, are not favourably regarded by the publishing firm of Cassell & Co., as represented by its Art Director, Mr. Edwin Bale, R.I.

* * *

THE identity of Mr. Bale will explain to the reader at a distance why in his paper, which we partly reproduce elsewhere, a distinct vein of hostility to photography is apparent. We allow at once that Mr. Bale and his fellow artists have cause to fear photography, but we shall lose faith in the wisdom of the British legislature if, under the cloak of the attempted amendment of copyright law, these jealous people are permitted to inflict injury upon the most popular method of graphic expression in existence. To proceed with our analysis of the motives of the new Bill's promoters: The draughtsman, Mr. T. E. Scrutton, we are told, formerly acted as Counsel for the Photographic Copyright Union. Now we find him in the opposite camp. Why, we do not know. He is credited with a threat to "make photographers sit up" by the terms of his Bill, which, however, judging from the tenor of

the copy we had in our possession last year, will probably not achieve that object in virtue of the clearest draughtsmanship. Mr. Scrutton's idea that photography is "merely the use of a Kodak," and "the mechanical operation of copying with the aid of light some pleasing scenery," emphasises, no doubt, in the minds of his instructors his qualifications to act as a draughtsman of a Bill dealing with such a simple subject as photographic copyright.

* * *

BESIDES Mr. Bale and Mr. Scrutton, a number of painters, bearing well-known names, have had a hand in the preparation of the Bill. This brings us to the most amazing thing in connexion with that monument of jealousy and injustice, viz., that, in the draughting of a measure designed to affect the commercial and other interests of thousands of photographers, not a single one of their number was called into consultation by the St. John's Wood conclave. Half a dozen painters take upon themselves to draw up a Bill striking vitally at a profession the members of which are numbered by thousands, and deliberately ignore that profession's claims to be heard in its own interests. Sir Lawrence Alma Tadema, the Chairman of Wednesday week's meeting, said his Committee (upon which photography was not represented) "sent a copy of the Bill to the photographic societies; with a request that they would be good enough to express their assent or dissent. He did not think they received an answer from those societies." To which societies did the Committee send the Bill? and when? Is Sir Lawrence aware that there are some 250 of these bodies in the United Kingdom? We are in touch with most of them, and do not recollect the Bill coming before a single one of them. We are strongly of opinion that Sir Lawrence has been misled in the matter.

* * *

ON the other hand, we have a distinct recollection of the meeting of a Committee appointed by the Royal Photographic Society to consider the proposed Bill. We had the honour of being a member of that Committee. Mr. G. A. Storey attended and read the Bill to the meeting. Its provisions affecting photographic copyright were viewed with disfavour. On Wednesday week Mr. Storey said he did not remember saying the Bill could not be altered. May we inform Mr. Storey, whose memory is probably not good, that at the meeting in question he was asked if his Committee would not meet a small committee of photographers to discuss the Bill? Mr. Storey said clearly and emphatically, No! We have a distinct recollection of this incident, for it was the Editor of this JOURNAL who put the question to Mr. Storey and received his answer. The St. John's Wood Committee, by the mouth of its representative, declined point-blank to listen to the representations of those whose commercial interests were most seriously affected by the Bill! We cannot find words strong enough to condemn this attitude of the Committee, the individual members of which would find it somewhat difficult to defend.

* * *

IT did not transpire at Wednesday week's meeting that in June last a representative body of photographers met, under the chairmanship of the Earl of Crawford, at the R.P.S. House, 66, Russell-square, and unanimously passed the following resolution: "That, in the opinion of this meeting, it would be an injustice to those practising and utilising photography to

interfere with the rights and privileges enjoyed by them under the Fine Art (Copyright) Act, 1862." All photographers ask for is to be left alone in the matter. There is a general agreement amongst them that the Act of 1862 has worked well in the interests of all concerned. The painters and sculptors are asking for more copyright protection; the photographers are content with what they have. The former are not satisfied to confine themselves to pressing forward their own claims, but they go out of their way to injure—or attempt to injure—a profession not quite so rich in the rewards and remunerative commissions which find their way to St. John's Wood and La Belle Sauvage. The conduct and aims of the promoters of the Bill are the reverse of fair, and the whole business is one which does not cast the most favourable reflection on those concerned in it.

* * *

OPPOSITION to the Bill is anticipated when it is reintroduced into the House of Lords, and we hope those anticipations will be fully realised. According to Mr. Bale's paper the provisions of the Bill do not differ from those which characterised last year's "dropped" measure. We fully exposed the gross injustice of that Bill at the time, and we shall take an early opportunity of renewing those objections if occasion demands. For the present, considerations of space oblige us to reserve further comments on Mr. Bale's paper and the discussion. Our object this week has been to arouse photographers to a knowledge of the grave dangers by which they are threatened, and to indicate the working of the wires by which it is sought to move the British legislature to legalise a very great injustice towards photography. The Bill promoted by the St. John's Wood conclave is the retaliation of those who, some years ago, were taught by the Photographic Copyright Union that a photographer's copyright interest was property in which he had a legal claim to be protected; it is the outcome of the jealousy of those who fear the progress and development of pictorial photography, and it is against the attacks of these two classes of enemies that we ask our readers to join us in protesting.

◆◆◆

THE PHOTOGRAPHIC HISTORICAL COLLECTION AT SOUTH KENSINGTON.

WE wonder how many photographers, or, indeed, how many students of photography, have visited the collection of historical photographic exhibits in the South Kensington Museum. Not many, we apprehend, or surely the authorities before this would have seen reason to arrange what for years past has been, as the tickets in the cases give the visitor to understand, "in course of arrangement."

This collection is located in the Science division of the Museum, the entrance to which is in the thoroughfare called the Imperial Institute-road, and finds itself in the same room with a goodly and glittering assembly of physical apparatus. Two large glazed cases contain the whole of what England can show in the way of a State collection of specimens illustrative of the history of photography. Though the contents of these cases are disposed "any how," they will well repay an hour or so's examination by any interested in the early, and by far most important, chapters of the history of photography.

Among the apparatus is a lens eight inches in diameter, made by Andrew Ross, with which, so it is stated, Talbot's *Pencil of Nature* was taken. Ross, it will be remembered,

figures rather prominently in the earliest days of the art-science as having been Talbot's informant as to what the Rev. J. B. Reade was doing in experimental work. A frame of the portraits of these pioneers—Daguerre, Nièpce, J. B. Reade, Mungo Ponton, and, the greatest of them all, Sir John Herschel—is at hand.

Of specimens of the Daguerreotype process there are several, remarkable rather for their early date than for their technical excellence. One is of Madame Daguerre, taken in 1839. Others are of Blot, Becquerel, Foucault, and Faraday. Another specimen is a "direct" Daguerreotype, i.e., taken by means of a reflector, to avoid the right and left reversal otherwise inseparable from the process.

Next in historical order, and one of the most interesting objects in the collection, is the first photograph on glass. This was produced by Sir John Herschel by the extremely tedious process of allowing silver chloride, suspended in water, to deposit on a glass plate, siphoning off the supernatant liquid, and afterwards, when the plate had been dried, exposing to light.

The collection of calotypes is entirely unrepresentative of the place of this process in photographic history. The prints and negatives are good, especially a series of Peterborough Cathedral, but the date of their production is some years after the perfection of the process by Fox Talbot in 1842.

Collodion is represented by positives by the "Archertype," "Ambrotype," and "Ferotype" processes, in 1851, 1853, and 1855 respectively, by a collodion negative intensified with Schlippe's salt, and by some collodio-albumen prints and negatives.

Printing processes form the subject of much more interesting exhibits. Prints on albumenised paper made from waxed negatives in 1853 are to be seen. Then Nièpce de St. Victor's process of printing in iron and uranium salts is represented by a frame of prints of various colours, in various conditions of preservation.

There are some well-preserved ferro-prussiate prints made in 1850, some fairly good uranium prints, some made by the ammonio-nitrate of silver process, by J. B. Reade and Alfred Taylor, and one in faint bluish-grey, made in potassium bichromate.

The most complete series, however, is that showing the development of the platinotype process, lent by W. Willis. Here is the first print, made on October 25, 1872, with ferric oxalate and platinic chloride, and developed on neutral oxalate of potash; the first print made with a platinous salt; an early print, in which paper was coated with a lead salt before sensitising with ferric oxalate and platinic chloride. The first patented process (1873) is here recalled by a print of an agreeable colour, the image of which consists of platinum, silver, and copper. Other early prints (1878) show the result of using platinous and lead salts in the coating and developing with a mixture of potassium chloro-platinite and potassium oxalate.

That other process of Willis's, the aniline *Lichtpans* process, is called to mind by a large line print. Sir W. Abney lends the first print made with vanadium.

Of special interest just now, when the tele-photographic lens is being used in warfare, is the first negative taken with the tele-photographic lens in 1891. The magnification is equivalent to that of a lens of 100-120 metres focal length, and the subject includes a crow hurrying home.

Of pictorial photography, Rejlander's *Two Ways of Life*, and some prints from negatives by D. O. Hill serve, unintentionally, no doubt, to remind us.

The cases contain a number of specimens illustrating process work. These include the first Woodburytype, and an admirable specimen it is. There are three proofs from Fox-Talbot's photographic plates, some examples of Husband's "Paprotint" process, and of Abney's "Papotype." Other examples of phototype printing on zinc, collotype, and of heliogravure on stone, complete a very incomplete collection of "process" processes.

That a Photographic Museum should exist, even the most utilitarian reader will not deny. The South Kensington officials are not apparently in the slightest degree engaged in arranging what they have the charge of, or in adding to it; and, indeed, it is to be questioned whether they are the best people to be intrusted with the scheme. Apart from the question of the dignified deliberation with which Government departments move, and the comparative inaccessibility of South Kensington to visitors to London, it cannot be expected that the Museum officials can be so in touch with current progress in photographic and photo-mechanical matters as to enable them to judiciously add to the collection. Now that the Royal Photographic Society has a home worthy of its objects, it is to be hoped that it will turn its attention to the establishment of a permanent historical collection. It is work which it can and ought to do, and one which will entitle it, if it does not gain it, to the gratitude of photographers of all classes.

The Combined Toning and Fixing Bath.—Our readers are quite aware that we are no advocates of the combined toning and fixing bath when the permanence of the results are a consideration, notwithstanding its convenience in use, unless it be employed with much greater judgment than it generally is. In the Foreign News and Notes last week it will be seen that Dr. E. Vogel, no mean authority in matters photographic, at the Berlin Photographic Society, fully endorses our views. He said that it was not advisable to use the combined bath for commercial photographs, notwithstanding its convenience and the fine tones it produced. At the same time he added that it was capable of giving durable prints when in good condition. That has always been admitted, but the difficulty is, with those unfamiliar with its reactions, to know when it is in good condition, for it will yield as good tones, often better, when it is in a very bad condition as regards the stability of the pictures. At the meeting at which Dr. Vogel brought the subject forward Herr P. Hanneke stated that, as a test, he had mounted a collodio-chloride print, toned with the combined bath, and poured a solution of hyposulphite of soda upon it, and allowed it to remain in that condition for several hours. The print was then slightly rinsed, and, after a lapse of two years, it had shown no signs of fading. It was demonstrated many years ago that even something more than a mere trace of hyposulphite of soda had no influence on the stability of a photograph; but it must be mentioned in this case that it was hyposulphite of soda, pure and simple, applied after all the hyposulphite silver compounds had been eliminated from the prints.

The 5×4 Size.—A few weeks back we, in a leading article, commented upon the standard sizes of plates and cameras now in use, and mentioned that it was a little difficult to see how they came to be adopted, as they were so erratic in their proportions. Up to the present the quarter-plate has been the favourite small size amongst amateurs and for hand cameras, but will it remain so? In America the 5×4 seems to be more popular than the English quarter size. Will that obtain in this country? Hitherto it has been a size not

much in vogue here; at least, of late years. We note that the cheap American productions, cheap as compared with English prices for cameras of the same efficiency and quality, are mostly of the 5×4 size. Till lately that size was not easily obtainable except at the risk of its being a long time in stock at many dealers', particularly in small provincial towns. Now we learn they are being more generally stocked by dealers. As an evidence that there was not much demand for this size, it is only just now, as we mentioned last week, that the Britannia Works Company has added the 5×4 size to their list of Platona paper, which shows that there is now a demand for that size. Some consider that the proportions of the quarter-plate are too square for pictorial purposes; but the 5×4 proportions are squarer, though for hand-camera work they may prove an advantage rather than otherwise, particularly when lantern slides are the object in view, as they will the better enable the picture to be taken from the negative either way without having to work the camera on its side. It also allows a greater margin in trimming of the finished picture. It remains to be seen if the 5×4 will supersede the old and now universal quarter-plate.

Phosphate of Silver Process.—In a paper on a phosphate of silver printing process, which Dr. R. C. Schüppaus recently read before the New York section of the Society of Chemical Industry (see p. 131), he makes some remarks on the comment we made in *Ex Cathedrâ* in our issue for November 17 last year on Dr. Johannes Meyer's patented process. In these remarks we said that Dr. Meyer was probably unaware that a phosphate of silver printing process was published in this country something like fifty years ago, which was not materially different from his, in both methods the sensitive salt being the phosphate of silver. Our reason for that supposition is to be found in the Doctor's Patent Specification, No. 17,098, dated August 23, 1899 (see p. 714 of our issue for November 10 last). In it he says, "The silver phosphates have so far not been employed for photographic or other purposes" (the italics are ours), "and the only mention of any application made of them is to be found in Hardwick's *Manual of Photographic Chemistry*. He writes: 'Other insoluble salts, such as the phosphate and citrate, render the paper more sensitive than when it has been treated with a soluble salt of silver only.'" From this we naturally assumed that the patentee was not aware of the prior use of phosphate of silver in printing. In Hunt's *Researches on Light*, 1854 (p. 120), from which we quoted, the author gives the working details of Dr. Fyfe's phosphate of silver process, which, he adds, was published *at a very early period* (italics again ours). Dr. Fyfe's process differs somewhat from that of Dr. Meyer's, inasmuch as the former dissolves the sensitive salt, the phosphate of silver, in ammonia, whereas the latter dissolves it in tartaric or citric acid. We here reproduce the last paragraph of the comments that brought forth Dr. Schüppaus' remarks: "The above rediscovery of one of the oldest processes of printing exemplifies what we have more than once said, namely, that experimentalists and would-be discoverers would do well to give attention to some of the older processes of photography in conjunction with modern knowledge of the principles upon which they are based. The outcome would probably be that some very useful processes might be evolved, and with great credit to the investigator." This sentiment, it may be added, has been re-echoed more than once in the States.

MR. CRAIG ANNAN'S PICTURES AT THE ROYAL PHOTOGRAPHIC SOCIETY.

We have hitherto refrained from making any comment on the Exhibition at the Royal Photographic Society's rooms, but we think, before Mr. Craig Annan's pictures are removed, a few words about the gifted gentleman's work would perhaps not be out of place. That Mr. Craig Annan is a gentleman of high culture and artistic ability goes without saying, but we are inclined to think that he sacrifices quality for the sake of versatility.

In photography, a one-man show, to be even of comparative interest, must contain a variety of different subjects. In this respect this Exhibi-

bition goes beyond the comparative stage, but does it enhance the reputation of the exhibitor? We should say not, except as regards the attribute above referred to, viz., versatility. But why, we ask, court this at the expense of quality? Many of the works are quite familiar to us. Much is inspired by the Dutch school, which, strange to say, again gives way to the aesthetic, a curious combination.

One can quite imagine from the treatment of Mr. Craig Annan's work that he could turn out with his numerous models a very fine show, entitled, "Types of Old Masters." The expression "with his numerous models" is not, however, comprehensive enough, for Mr. Craig Annan goes further, and carries his veneration for the earlier schools to such an extent as to actually penetrate into the countries where their artists loved to paint. But has the operator attained that measure of success in his efforts that careful study of his favourite masters should inspire? On the portrait side perhaps he has. At any rate, he has seized upon their salient points, and turned them to his own advantage, and traces of their influence are visible everywhere in his work. [Query: Is the absorption of antiquated ugliness compatible with modern photographic ideals?]

We like Mr. Craig Annan best when he is original. To us the simple Scotch lassie and the little child treated in Mr. Craig Annan's graceful and artistic manner appeal more strongly than the heavy Dutch stiff-necked models. The one is original, graceful, even Greuze-like in ideal; the other is Boer-like in solidity. And who does not prefer to note the dainty shoe of the English maiden to the heavy Dutch sabot?

We admit much, very much, is to be learnt from the early schools of Dutch and Flemish painting; yet, by following it too far, there is a fear of degenerating into a mere copyist, and it is then only a few degrees farther down the scale to become a servile imitator (a fate we, however, do not fear for one possessing Mr. Craig Annan's abilities).

On the landscape side there is a similar trace of some of the heavier Dutch or Flemish masters, but without their gift for lightness. Nearly all Mr. Annan's landscapes are dull. Whilst one picture, at least, is obviously inspired by Hobbema, there is no corresponding attempt, perhaps wisely so, to depict the masterful lighting of Cayp.

Even in the exhibitor's picture of *A Lombardy Ploughing Team*, where there is strong sunlight casting strong shadows on the backs of the cows, the effect is sombre. It does not suggest noon tide heat, there is no suggestion of sunlight, the whole is subdued to the extent of apparent falsity. It is clever, no doubt, but there is an aesthetic-cum-Dutch feel about it. This is a curious mixture.

Then, there is a *Veronese Vineyard*, oxen ploughing almost in the dark, with a dwarf-like "man with a muck-rake" doing something to the ground. It is an Egyptian hieroglyphic kind of subject, long, panel-shaped, but it is not true to nature, although it may be considered clever; at any rate, it is a change from the everlasting mud-flat school of some of Mr. Craig Annan's contemporaries. This subdued heaviness is taken even into that glorious land of light and colour, viz., Venice.

Let us look at the *San Maria della Statute*, and what do we find? A comparatively indifferent picture, minus luminosity, in a land that is always luminous. The Thames, even on a dull day, with St. Paul's in the distance and barges in the foreground, would turn up its nose in sheer disdain at its gloomy rival.

A Lombardy Landscape is evidently a Hobbema inspiration; it is an over-exposed black mass of Flemish eccentricity, a remark that may also be applied to *A Utrecht Pastoral*. In the latter, however, the Hobbema treatment is more marked, and has the addition of big, bulbous sheep at more or less regular intervals on the right. Still this picture is not unpleasing.

We have dealt with these things as they occurred to us, and have not taken the pictures in order; in fact, there is neither beginning nor end, the pictures are "just hung." Whilst on the landscape side, however, we think we had better complete our remarks thereon.

Another *Lombardy Pastoral* contains long hills, lanky trees, and leggy sheep. The trees are at regular intervals, some with balloon-like tops, which, however, serve to break the long, liny look of this somewhat sombre picture.

Geneva is a commonplace study of three horses and shipping—still, a dull day, and no clear Continental light visible.

The Dark Mountains borders on the mystic. Four dark figures in almost prayerful attitudes stand—at least, we take it for granted that they stand—on a mass of blackness, presumably *terra firma*, but it is so black that we could hardly tell what it was they stood on. Their backs are to the spectator. Black middle distance and very dark mountains, with a terribly weird cloud effect and two rather strong light patches of water, complete the mystery.

A Haarlem Canal is a square, uninteresting picture—all bank and canal, and a little bit of reflected landscape in the water. It matches *sheep*, which is rather fuzzy—all bank and not much sheep.

The Road through the Dunes is better; the composition is capital, but there is still that look of "dim religious light" about it.

A Canal of Holland is another capital picture. It is, of course, a typical one of the country, and there is a swirl about the waters that carries conviction with it. Here the operator's meaning is made clear at a glance, but there is a want of "atmosphere" about the picture. There is sea piece—the *Adriatic*, we think, is the title—that also appeals to us very much; the waves gently beating on the flat, sandy shore are extremely well done. Then, there is more light here, though that is too subdued, in view of the fact that the figures appear almost black against the background. Still, the *Adriatic* is not like Mr. Craig Annan's interpretation of Lombardic scenery, from which one would judge that Lombardy was a country of perpetual night.

There are one or two other pictures we ought to mention. *The Fishers' Lives* we like as well as any of the sea studies. Here we have one of Mr. Craig Annan's happiest bits. The whole picture is in harmony. It is simple and natural and full of interest; it requires no interpretation, only lacks light.

On a Dutch Shore is another nice composition, strongly reminiscent of the sea-painter G. de Beaumont for its life and movement—especially in the boats. But, alas! the blackness of it—black sky, black sails, black people, and black foreground. This is a fault not traceable to the Dutch landscape school, we are sure.

We will finish the landscape side by noticing about two and a half feet *Zand Voort Beach*. What is there artistic, or even of interest, to take an elongated mass of humanity dotted at more or less regular intervals along the seashore—a picture, when finished, that looks from a distance like a silhouetted cinematograph film?

Now, *A Potato Field* is better; it is the antithesis of the other. It is long and narrow, it is true, but the white garments of the peasant women make a pleasing contrast with the darker background; there is not that long mass of black figures as in the other picture, which is so detrimental to its success, in spite of the toning-down process.

On the portrait side Mr. Craig Annan is happier. The subdued lighting is more suitable in many cases to the sitter and his or her surroundings. Here are two attempts that we think go beyond the prosaic province of photographic delineation. The soul is an ideal capable of being depicted by an artist of the brush, and not of the camera, and but few men in the higher branch of art have succeeded in presenting us with anything like an adequate idea of the soul. We have one only in mind at the moment, viz., Rossetti.

Mr. Craig Annan's picture of *Eleanore* is not, of course, new. From a photographic point of view, no doubt, it is most excellent, except as to the baggy figure, which appears to be neither sitting nor standing, and looks in consequence stunted.

The other picture, *The Church or the World*, is more allegorical than fulful. For those who have not seen this work, we may say that the models are a man with a cowl to represent a monk, a Highland pony (presumably Shetland), a girl with a subdued landscape as a background. The girl is dressed in white, and decorated with a garland of flowers. He is seated on the Shetland pony near the centre of the picture. The owled monk stands at the head of the animal. He is almost too dark to be seen, and the Shetland pony looks restive, and the girl as if she would step off its back. There is a painfully vacuous look on the girl's face. The world does not seem to have much charm for her on the one hand, nor do the spiritual attractions of the Church appear to appeal to her on the other. The picture is very subdued—so were we when we saw it. The motif may be excellent, but—

Maidie, a child study, was perfect. *Agnes*, another, was commonplace. *Phyllis and Prue*, a fine light-and-shade study—not new, but none the worse for that. *Nancy*, a child, simplicity without effort, and with very little detail, but excellent. *Molly*, a fuzzy-wuzzy, over-framed baby face—a beautiful child, but its own mother wouldn't recognise it, in spite of the care lavished on the aluminium frame. This in itself is a work of art, though a combination of crabs and butterflies is unique.

Sisters is rather spoilt by the straight arm and long sleeve, and there are three heads of Dutch women—beautiful studies, and careful—that are well worthy of notice.

A Painter's Page has not the refined look one associates with the artistic fraternity even in the lowest ranks, his ruffles at neck and wrist however, made him look like a superior kind of Pierrot, and his feet, which are large and match the paint brushes, which are exaggerated in size.

Mr. Orchardson, as a portrait, is perfection. *James Guthrie, R.S.A.*, is slightly out of focus, but the pose is good; and *Jan* is better than his master's opposite in *A Dutch Dog Cart*.

The portraits, in fact, all round were nearly all excellent examples of Mr. Annan's work, but there was one particular study that took our attention in passing out of the room, and that was *The Marble Cutter*.

We don't know whether Mr. Annan got his inspiration from *Wright of Derby* or Rembrandt; but, judging from this work, we should surmise that he got his idea from the former.

The picture of the marble-cutter represents a sculptor at work. There is a strong light falling on him, and his work, as well as on several other pieces of sculpture, the rest is in darkness and semi-darkness.

It is just one of those efforts that mark the man as an artistic photographic genius.

The frames are not always in keeping with their subjects; for instance, take that of *A Little Princess*, in white enamel contrasted with a deep sepia.

The enamel is old and yellow and the contrast too vivid.

Take again *Jan* and his opposite neighbour in the dog cart; the frames are more noticeable than the pictures, the fluted or lined woodwork causes more notice than the picture itself.

Versatility or variety in frames is apparently just as necessary as it is in the show itself.

CRITICUS.

SOME MORE COLOUR SENSITISERS.

VALENTA has been continuing his researches on the sensitising action of the aniline dyes, and in the current number of the *Photographische Correspondenz* gives his results. The dyes, as in his previous experiments, were used for bathing the plates in a strength of 1·25000 to 1·50000 with one to two per cent. of ammonia.

DYES FROM THE COLOUR FACTORY, FORMERLY FR. BAYER, IN ELBERFELD.

Benzoroth SG* gives a vigorous band from B to D $\frac{3}{4}$ E, with maxima at C $\frac{1}{2}$ D, and D $\frac{1}{2}$ E.

Tronaroth 3 B, and Tronaviolett B, act as weak sensitizers; the former gives a faint band from C $\frac{1}{2}$ D to D $\frac{3}{4}$ E, with maximum at D; the latter a band from D $\frac{1}{4}$ E, with maximum D $\frac{1}{2}$ E.

Plutoorange G sensitises from D to C; with long exposure, maximum at D $\frac{3}{4}$ E.

Plutobraun, of which several kinds were tried, gives generally unsatisfactory results on gelatine plates; but, the kinds marked N B, G G, and R acted well with collodion emulsion, and, with long exposure, a closed band, extending from A to beyond E, was obtained, so that, with the use of a pale yellow screen, almost a closed band was obtained, from A to H. G G gives two indistinct maxima at D and E. Plutobraun R gives a band from C to D $\frac{1}{2}$ E, the action of the blue was greatly lowered, so that it was less than the yellow and red.

Azosäreublau 6 B gives on collodion emulsion a band from A $\frac{1}{2}$ a to D $\frac{1}{2}$ E, maximum at C $\frac{1}{2}$ D.

Victoriaviolett 4 BS gives on collodion a band from B to D $\frac{3}{4}$ E, maximum at C $\frac{1}{2}$ D.

Wollblau N gives, on gelatine plates, a narrow but vigorous band at C.

Diazoindigoblau M colours neutral silver bromide intensely, and gives with long exposure a band from a to E. The action of the blue was very much decreased.

Benzoldunkeldrum GG does not sensitise gelatine plates, but collodion emulsion strongly. With short exposures it gives a narrow band from a to B; with long exposures, almost a closed spectrum from A to H.

Plutoschwarz BS gives with long exposure a vigorous band from a to D, with maximum at C. Plutoschwarz FR gives with collodion a band from A to D $\frac{1}{2}$ E, with maximum at B.

Diamantschwarz FR gives with long exposure a vigorous band from A to D, with maximum at B $\frac{1}{2}$ C.

Directblauschwarz 2 B gives a weak band from a to D $\frac{1}{2}$ E with short exposure; with long exposure, two maxima at B $\frac{1}{2}$ C and D $\frac{1}{2}$ E appears.

DYES FROM THE ACTIENGESELLSCHAFT FÜR ANILINFABRICATION.

Greynearvolett 4 B acts vigorously on gelatine plates, but causes red fog; band from C to D $\frac{3}{4}$ E, with (2) maxima at C $\frac{1}{2}$ D and D $\frac{1}{2}$ E, the former of which is vigorous.

Greynegrün B extra gives with long exposure a narrow, tolerably vigorous band at C $\frac{1}{2}$ D.

Laubgrün (without ammonia) gives a narrow, and only with long exposure a vigorous, band from B $\frac{1}{2}$ C to C $\frac{1}{2}$ D, maximum by C.

Aethylgrün (crystallised) gives a narrow, sharp band from B $\frac{1}{2}$ C to C $\frac{1}{2}$ D.

* In all cases the German names of the dyes are given.—Trans.

Mandarin G extra and RL gives with long exposure a broad band from A to D, in which are two maxima, at B and C $\frac{1}{2}$ D. TRL dye gives a fairly strong band from C to D, with maximum C $\frac{1}{2}$ D; with longer exposure a faint band appears between D and E.

Echtblau R (for wool) behaves very much like the nigrines, and gives (3) bands: one very vigorous from C $\frac{1}{2}$ D to C $\frac{3}{5}$ D, then a weaker from A to B, and finally a third from D-D $\frac{1}{2}$ E. With somewhat stronger concentration of the bath red fog appears.

Wollschwarz 4 B is a very vigorous sensitiser, which acts vigorously with short exposure, and gives a broad band from A to beyond D, with indistinct maximum at B; with long exposure, another band from D $\frac{1}{2}$ E to E almost. This dye lowers the blue sensitiveness somewhat, as it hardly exceeds that of the yellow and red, and it ought to be useful in practice.

Columbiashwarz B gives a vigorous band from A to C $\frac{1}{2}$ D, with maximum at C, and strong red fog.

Formylviolet S 4 B, made by Casella, of Frankfort, which is synonymous with Saüreviolet 6 B of Geigy, of Basle, and with Saüreviolet 4 B of Bayer, of Elberfeld, is a very good sensitiser, which acts vigorously even with short exposures, and gives with short exposures a vigorous band from C to D, with plain maximum at C $\frac{1}{2}$ D; with long exposure, another from D to D $\frac{3}{4}$ E appears, so that the sensitising action extends from C to E, and it is not far behind the action of the blue rays.

A SILVER PHOSPHATE PRINTING PROCESS.

BEFORE the New York Section of the Society of Chemical Industry Dr. R. C. Schüppaus recently read a paper on a new process for sensitising paper and other surfaces. This new process of sensitising paper and other surfaces, he said, is the invention of Dr. Johannes Meyer, a practising physician of Brooklyn. It is based upon the application of one of the phosphates of silver to the surface to be sensitised in conjunction with an organic acid. THE BRITISH JOURNAL OF PHOTOGRAPHY speaks in its issue of November 17, 1899, of this invention as the rediscovery of one of the oldest printing processes, namely, Dr. Fyfe's, and incidentally charges the inventor with a lack of familiarity with the older literature of the art. In this particular instance I think it is well that Dr. Meyer knew nothing of the earlier work and comparative failures of Dr. Fyfe and Mr. Maxwell-Lyte, for such knowledge might have prevented him from making an invention which, in its simplicity and beauty, is a boon to every photographer. The friendly critic is in error, however, when he speaks of Dr. Fyfe's process as "not materially different from that which has just been patented," meaning Dr. Meyer's. He quotes quite freely from Hunt's *Researches on Light*, published in 1854, in support of his position. I quote from the same author's *A Popular Treatise on Photography*, Glasgow, 1841, p. 21:—

"Dr. Fyfe appears to have been the first to suggest the use of the phosphate of silver as a photographic material, but I am obliged to confess it has not, in my hands, proved anything like so successful as, from Dr. Fyfe's description, it was in his own."

And this same passage appears in Hunt's *Manual of Photography*, London and Glasgow, 1854, p. 120. What Dr. Fyfe actually did was this:—

1. He produced a precipitate of silver phosphate in the fibres of the paper by double decomposition between sodium phosphate and silver nitrate.

2. He coated paper with a solution of silver phosphate in ammonia or ammonium carbonate.

3. He spread a paste made of precipitated silver phosphate, dried in the dark, with spirits of turpentine and Canada balsam on canvas.

Dr. Meyer was searching for a paper more sensitive than the ordinary commercial article, and certain theoretical considerations led him to experiment with the silver phosphates. After establishing their solubility in certain organic acids such as tartaric, citric, and succinic acids, he applied silver phosphate dissolved in an organic acid to paper, and, in further pursuit of this kind of work, discovered the emulsion of silver phosphate and tartaric acid. It took many months of patient research before the conditions were determined under which this remarkable emulsion is formed. Before going into the details of preparation, I will say that the metaphosphate and pyrophosphate do not differ materially in their behaviour from the orthophosphate, but that, by phosphate simply, the orthophosphate of silver is meant. To make the emulsion of silver phosphate and tartaric acid, which has given such good results in making photographic prints, 4 grammes of silver nitrate in aqueous solution are precipitated by 4.7 grammes of sodium phosphate dissolved

in half a litre of water. The precipitate is washed carefully by decantation, and by tapping and cautious removal of water brought to the volume of 32 c. c. From 18 to 20 grammes of tartaric acid are dissolved in an equal number of c. c. of cold water, and, while this solution is added as rapidly as possible to the phosphate precipitate, a quick rotary motion is imparted to the containing vessel, preferably a wide-necked bottle made of yellow glass. The experienced observer will notice a change of colour, the yellow phosphate held in suspension turns into a whitish cream. We have now about double the volume of the original mixture of a stiff jelly. By keeping it at a temperature of about 33° C., it is rendered more fluid. In this fluid condition it is suitable for coating paper, plain, albumenised, or otherwise prepared, by means of a flat brush or of suitable machinery. The proportions above given are the best for practical work, they also yield good results when much larger quantities are employed. It is possible, however, to obtain the emulsion with a good deal less of tartaric acid, say 8 grammes in 8 c. c. of water to the 32 c. c. of mixture previously referred to. With these proportions the emulsion will set more readily, and it may be better for a beginner to first try these. When the emulsion is left in the cold, crystallisation sets in after some time, and only a portion of the silver remains in solution. The chemical reactions coming into play are so far entirely obscure. It would appear probable that acid phosphates might be formed, yet the ordinary silver phosphate is deposited unchanged from its solution in acetic acid.

Of acid solutions the citric-phosphate solution has been most tried. With 32 c. c. of the phosphate mixture 48 grammes of citric acid yield a clear solution of great sensitiveness. Both emulsion and solution have been applied to materials other than paper, such as wood, celluloid, lithographic stone, marble, silk, cotton, and linen, and prints of great beauty and durability been produced thereon. They may be applied to the surfaces as such, or these surfaces may first be coated with albumen, gelatine, or the like. In the latter case a print can be obtained, either in direct or diffused sunlight, in less time than with the ordinary photographic papers, and there is no difficulty in printing out by arc light just as quickly as in shaded daylight, the emulsion permitting more rapid work than the solution. While the ordinary albumenised papers will not keep, papers sensitised after this new method will keep indefinitely in any climate if only protected from dust and light. The prints can be toned and fixed in the ordinary way, with only this difference, that a dilute hypo bath must be employed. Toning and fixing may be done at any time, even months after printing. The predominant colour of the prints being a very pleasant brown or auburn, toning may, in a good many cases, be dispensed with. Very agreeable reddish effects can be obtained by giving the prints a citric acid bath before fixing. If this method is followed, the prints are washed with water before transferring them to the hypo bath. The latter should be composed of 35 grammes of sodium hyposulphite, 2 to 3 grammes of carbonate or bicarbonate of soda, and 1 litre of water. After leaving the prints from one to two minutes in this solution, they are washed for five to ten minutes in cold or warm water. In this alkaline bath the tone is not changed, though the colour appears considerably lighter in the wet state than it does after drying. Only the slightest over-printing is required if the prints are removed directly from the printing frame to the fixing bath. They need no over-printing at all if they are toned, as they gather strength in the toning bath. If left too long in the hyposulphite solution, sulphuration of the prints will set in. Yet, if not too long continued, the sulphurated prints obtained are permanent.

The sensitiveness of the emulsion may be still further increased by the addition of a small quantity of citric acid. When the ordinary silver bromide emulsion is added to it, direct prints can be obtained by the light of a petroleum lamp. The silver phosphate papers can be used for developing out just as well as for printing out.

In the course of a short discussion, Mr. S. V. Haus asked what were the proportions of phosphate and tartaric acid?

Mr. M. Toch, asked what was the effect if the prints were subjected to sulphuretted hydrogen gas? It was very essential that that should be tried, because the permanency of the print depended on it. Five or six years ago, when gelatine printing-out paper was invented, photographers welcomed it, as it did away with the old method of silvering albumenised paper; but after a year the prints turned greenish and then faded out in spots. Dr. Leo Baekeland and himself had attempted independently to find out the cause of this fading, and they both came to the conclusion that sulphuretted hydrogen was the cause.

Mr. Haus asked if the emulsion had ever been microscopically examined to see whether it was true emulsion, and if they had ever tried to tone it down to a blue colour?

Mr. Herman Poole asked if the author had ever used lactic acid? Dr. R. C. Schüpphaus, in reply, said that the proportions were 4 grammes of nitrate to 4·7 grammes of sodium phosphate. Some of the prints exhibited that night were over two years old, and had been kept under the most varied conditions without any apparent change. It was a true emulsion. They had tried to tone it down to a bluish colour, and it had stood the precipitation from the toning in the case of gold. Lactic acid had not been tried so far.

GLASGOW INTERNATIONAL EXHIBITION, 1901.—THE PHOTOGRAPHIC ARRANGEMENTS.

It has already been announced that the Executive of the Glasgow 1901 Exhibition intend to allow "hand" camera photographs to be taken by visitors in the grounds of the Exhibition. The right to photograph inside the buildings and to use a stand camera in the grounds is to be set for a "consideration." The successful contractor will be prohibited from photographing in the Fine Art Section except by special permission, and, while permitted to sell general views of the Exhibition and exhibits, he must obtain the consent of the individual exhibitors. He shall have the right to erect a studio with an area of 625 square feet, and shall be allotted a stand with an area of 100 square feet for the erection of a stall or the sale of photographs. The Executive reserve the right to employ the contractor or any other photographer to take and reproduce photographs of the opening or other ceremonies within the buildings or grounds. They also reserve the right to use, and license for use, mutoscopes, biographs, kinematographs, and automatic machines for the exhibition of photographs. The contractor shall erect, decorate, equip, and maintain the studio and stall to the satisfaction of the General Manager. The studio shall be used for taking, reproducing, and selling photographs, and for no other purpose. The stall shall be used for the sale of photographs only, the word "photograph" excluding "fancy goods" with photographs printed upon them. A tariff of charges for all standard sizes of photographs must accompany the tender, and the contractor shall be bound not to charge more than this tariff. The rates are to include any charge for sittings or proofs. The contractor must also satisfy the Executive of his ability to carry out the contract, and pay one half of the sum tendered at the time of signing the contract, and the other half on March 1, 1901. Tenders are to be delivered at the office of the General Manager, 36, St. Vincent-place, Glasgow, on or before March 15, 1900. The contract during the Exhibition of 1888 was held by Messrs. T & R. Annan, Sauchiehall-street, Glasgow, who paid a certain percentage of their drawings as the sole occupiers of the Exhibition photographic studio and stall, which they had to build and equip at their own expense. The coming Exhibition, like the last, will open early in May and close at the end of October.

DOUBLE TONES IN GELATINO-CHLORIDE PAPER.

DOUBLE tones in the gelatine printing-out paper are generally attributed to the use of sulphocyanide of ammonium or potassium in the bath. Whether this chemical really predisposes the paper to take on this mottled appearance I cannot say, but I have noticed that the sulphocyanide when used with a scanty proportion of gold chloride caused the image to drift in the undesired direction of double tones. The defect of one is most noticeable in the half-tones of the print, says a contributor to an American contemporary, and especially at the edge of vignettes.

Probably a properly constituted sulphocyanide bath would give as even tones as any other baths, but most of the toning formulae seem to me to have a dangerous amount of the sulphocyanide in proportion to the quantity of chloride of gold.

The double tones are associated with weak bath, and therefore I use a larger proportion of gold than is set down in the formula for toning, and, besides, I never use an exhausted bath. I believe that there is no saving in the homoeopathic formula with gold.

In albumen printing days we estimated that one grain to the sheet of paper was the limit on the side of economy, but few printers then kept to his ebb point in gold, but sought to increase the beauty and richness of the tone by stronger gold bath. Other things being equal, I think we should not use less than two grains of gold to the same amount of gelatine paper. The permanency would be better assured, for it stands to reason that gelatine paper requires more gold even than albumen paper.

The gelatine paper requires a bath sufficiently concentrated to change the colour of the print without subjecting it to a prolonged toning, which is sure to run the print into double tones.

A rather quick-acting toning bath, free of sulphocyanide, is made as follows:—

Chloride of gold	15 grains.
Carbonate of soda.....	230 "
Chalk	70 "
Water.....	32 ounces.

After twelve hours the bath becomes clear and is ready for use.

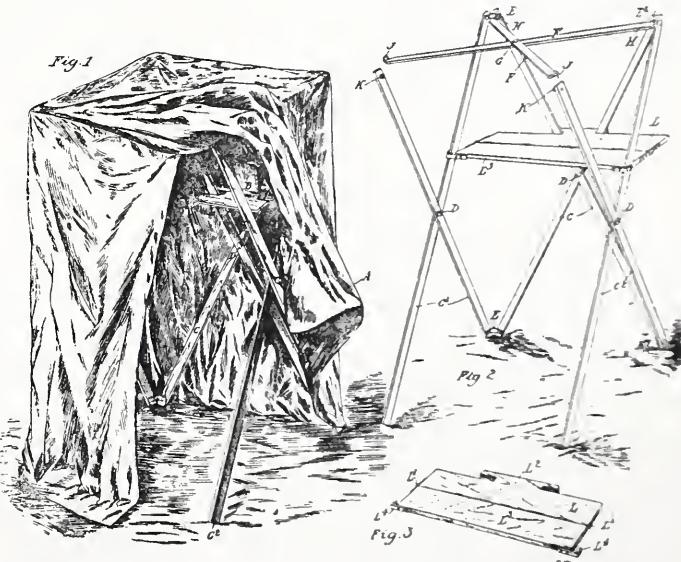
The prints are to be first well washed in several changes of water before subjecting them to the toning operation.

The trouble, however, with the use of too rapid toning solutions is that it is difficult to get more than one tone, and that has a tendency to coldness, and there is also a liability to eat away the lines of demarcation between the lighter tones and destroy the gradations.

COLLAPSIBLE DARK ROOMS.

THE invention here described is the subject of a patent by Mr. A. E. Anderson and the "X" Chair Patents Company, from whose specification we take the following particulars:

The outer cover, A, may be made of any convenient flexible material, made up into the form the dark room is desired to take, and is provided with a window, B, also of flexible material. The cover, with its window, B, may be made after any well-known method to prevent the penetration of the actinic rays of light, and, if desired, may be waterproofed. The sides of the frame by which the cover is supported comprise in this instance three pairs of members, c, c¹, c² respectively. These members may be of any suitable material, such as wood, and of any convenient cross section, and are made to cross each other preferably at their centres, where they are secured together by a rivet, D. Each pair of members is free to turn about its pivot, D, and the ends of the members, c, are secured to the ends of the members, c¹, by brackets, E, and at the other side to the ends of the members, c², by brackets, E¹. The members are preferably riveted to the brackets, E, E¹, and are free to pivot about the rivets as described with reference to the rivets, D. The members



thus arranged form three collapsible walls for a four-walled room, and a top is provided comprising another pair of cross members, F, riveted together at G, and hinged on one side by loops, H, to the upper brackets, E, E¹, of the members, c. The ends of the members, F, remote from those secured to the members, c, are provided with hooks or claws, J, adapted to fall into loops or catches, K, at the end of the members, c¹, c², and remote from the brackets, E, E¹.

It will be seen that so long as the hooks, J, are not in engagement with the catches, K, on the members, c¹ c², the members, F, may be swung down upon the hinges, H, so as to hang approximately parallel to the members, c, and the whole frame collapsed by bringing the bottom ends of each side together. When, however, the hooks, J, are in engagement with the catches, K, on the members, c, c¹, the upper ends of the members forming the walls or sides of the frame are prevented from coming together, and a suitable covering may be placed over the whole.

As placing a separate covering over these members might be found inconvenient, the cover, A, is preferably secured at its corners to the tops of the members, c, c¹, c², and, when the frame is collapsed, remains attached to and folded over the collapsed members.

Detachable brackets or carriers may be arranged within the dark room, and may be made either in two parts hinged together or in one piece.

A shelf or carrier, L, is shown in figs. 2 and 3, which may be folded about its centre at L¹. The shelf, L, is provided with a projection, L², somewhat resembling a cleat, that end of the projection remote from the shelf being of greater length than that part by which it is secured to the shelf. This formation of the part L² permits the shelf to be placed over the members, c, for instance, above the point where they cross one another, so that the extended portion of the projection comes behind the members, c, and the members are engaged in the recesses formed between the extended portions of the projection and the shelf; the neck of the projection thus becomes wedged between the two members, c, and serves as an additional support or strut, which keeps these members from collapsing. The forward part, L³, of the shelf, connected by the hinge, L¹, may be provided with hooks or other devices, L⁴, formed to engage the members, c¹, c². In the arrangement shown in fig. 2 this is effected by lowering the forward part, L³, of the shelf down upon the members, c¹, c², so that the hooks or catches, L⁴, embrace the members upon which they fall. The forward end of the shelf is by this means supported, and the shelf made to serve as a tie between the members, c and c¹, c². It is obvious that the hooks or catches, L⁴, may be arranged to drop into loops secured to the members, c¹, c², instead of embracing the members as described. When only a small shelf or bracket is required, the hinged portion, L³, may be dispensed with, and the bracket supported only by the part, L², as shown in fig. 1.

Guy ropes may be used secured to pegs in the ground, or weights, to prevent the dark room from being overturned by wind or other cause.

It will be observed that the covering at the side corners of the dark room is not supported by any part of the frame, but hangs from the top of the frame. These may, however, be supported, if desired, by a flexible connexion, such as a cord or elastic band, connecting the tops and bottoms of the members at each corner of the framework. If elastic is used, the whole may be closed up without detaching these ties; but, if some non-elastic material is used, each piece must be secured at one end by some means equally detachable.

The bottom ends of the members, c, c¹, c², may either rest direct upon the ground, or be provided with spikes to enter the ground, or they may rest upon, or be secured to, horizontal members serving as struts to give greater stability to the whole structure. As a rule, however, it is not found necessary to use struts in this manner, except in some cases, one at the front end connecting the members, c¹, c², on that side where the dark room has no framework. This side serves as the entrance to the dark room, and the one side of the cover, A, is made to lap over the other a sufficient distance to exclude all light. Any well-known form of fasteners may be provided to prevent this part of the cover from being displaced whilst using the dark room.

ARTISTIC COPYRIGHT.

[Abstract of a paper read at the Society of Arts.]

IT was not until the year of the second International Exhibition in London, the year which saw Captain Fowke's great brick exhibition building erected at South Kensington on the ground now occupied by the Natural History Museum, the year after the death of Prince Albert, that is to say, not until July 29, 1862, that the law came into force, the preamble of which begins as follows: "Whereas by law, as now established, the authors of paintings, drawings, and photographs have no copyrights in such their works, and it is expedient that the law should in that respect be amended. Be it therefore enacted," &c. And so it comes about that there is no copyright in any painting, drawing, or photograph, executed and dealt with before the middle of the year 1862. It is a fact, somewhat difficult of realisation, that some of the most important works produced by the pre-Raphaelite brotherhood, by Sir John Millais, and Mr. Holman Hunt, who is still with us, have not, and never had, any legal claim to copyright protection.

The term of this 1862 Act differed from its predecessors by being made dependent on the life of the author, to which life seven years were added. In the Literary Copyright Act there are two terms—the life of the author and seven years, or forty-two years, whichever may prove the longer. But in taking a fixed term like forty-two years, it is necessary to have something to start from, and with a literary work it was easy to start from the date of publication, and there was consequently no difficulty in giving such choice of terms; but there exists no such thing as the date of publication of a painting, although, in the endeavour to bring painting and literature under one Act, attempts have been made to invent for the purposes of the law some action, which should be called or considered as publication; but the difficulty was evidently before the author of this Act, and the artist's term was made his life and seven years after his death, without any alternative. This term applies, of course, equally to photographers.

A most important point arises in answer to the question, In whom is the copyright vested? The Act, says "the author," and the Courts have decided that, as regards photography, that is to be taken to mean the person who takes the negative, not the person who employs him, but the operator himself. A case came before the Courts in which a firm,

consisting of two persons, employed a number of photographic assistants. One of the managers, thinking that a photograph of the Australian cricketers would find a good market, made arrangements with the cricketers to photograph them without charge, and the firm sent one of their photographic operators to make the negative, which he did, and prints were taken from it in the usual way. The photograph was pirated, and the firm who had registered themselves as the owners of the copyright brought an action for infringement; but it was held by the Court that the assistant who actually took the negative was the author of the photograph, and that its registration in the name of the firm was consequently null and void. There are other cases bearing on this ruling.

I said just now that this Act was originally initiated for the protection of the painter only. I believe it was, so to say, an accident that it came ultimately to include photographs. It was thought that they were protected by the Engraving Acts with the addition of the clause covering lithographic prints taken by any mechanical process, and the inclusion of photography was not originally contemplated, but the photographer feared that their prints being of a different character from those taken from engraved plates or lithographic stones might not be protected, and ultimately photography was included.

I trust I have thus far succeeded in giving you an intelligible idea of the history of artistic copyright down to the present moment, but it remains for me to review the whole result, and to ask, How does the matter stand to-day?

We have five Acts. Three deal with engraving, one with sculpture, one with painting, drawing, and photography, between which there seems to be little or no relation. We have, first, three terms of duration of copyright—twenty-eight years for an engraving, fourteen for sculpture, with a second fourteen if the artist be alive at the end of the first; life and seven years for a painting, drawing, or photograph.

There are two different relations of the artist to his copyright. The sculptor's right to sell his work and retain his copyright has never been questioned. The retention of the painter's copyright is made to depend upon the signing of a document by the purchaser of his work.

Two modes of treating artists, as to registration, also exist. The engraver and the sculptor comply with the law by putting their names and dates on their work, and they are not required to register. The painter cannot protect his copyright without registration; while registration itself, as it is now required, is a snare, a delusion, and a pitfall. Designed to give the public information as to ownership and duration of copyrights, the uncertainty of its operation simply results in the prevention of information on these very points.

And now we come to the consideration of the proposed new Artistic Bill. As its memorandum states, it is intended to simplify and amend the law relating to copyright in artistic works. Its main features are—

1. To secure greater uniformity in the terms and conditions of copyright.
2. To reserve to the artist—with certain exceptions—the copyright until expressly assigned or disposed of by him.
3. To make registration of copyright—and of all dealings therewith—with certain exceptions, compulsory.
4. To improve the remedies for infringement.

There are two terms of copyright conferred by the Bill:—

1. For an original work of fine art, the life of the author and thirty years after his death.
2. For a work of fine art made by one person from the design of another; for a photograph, for a cast from nature, thirty years from the first day of the month of registration.

There can be no kind of doubt that, under the existing Act, the artist is placed in a position of great disadvantage when compared with the photographer, and the proposal of the new Bill is to do away with these disadvantages, and, taking into consideration the differences which exist between various forms of art and photography, to devise a term of copyright protection which shall meet the needs and circumstances of all of them without injury to any.

Works of art divide themselves naturally into two classes, the division between which is an intelligent one and readily perceived.

An original work of art is, from its inception to its completion, the work of the artist, imagined and thought out by his brain, and embodied in some graphic or plastic form by his hands. The highest art is the expression of a thought or feeling in forms suggested by nature, and put into shape with the skill of the craftsman. Art and nature are quite distinct things. Art is nature that has passed through the alembic of the artist's brain, and has been embodied by his hands; and there is a clear distinction here between such original work and the translation of such works after they have been produced into some other form by engraving, or other similar process, or the mere reproduction by mechanical means, like the casting of simple natural forms; this is a distinction not of better or worse, but merely of kind, and this difference of kind is of vital importance. The man who works with high artistic aims has almost always to work and wait for long and perhaps weary years before he commands his public. The painter, the sculptor, the inventive engraver, works not for the public but for himself. He works at subjects that please himself, and in a manner which he alone approves. He has to educate his public before he can reap his reward; often he

never reaps it, and still more often it is not till he is well on his career, and close upon the end of his life, that his works have any copyright value. The photographer, the translator engraver, who mainly works on commission, enters upon his harvest at once, and the difference of terms proposed in this Bill is to give the children of the artist some chance of reaping what the father in his lifetime failed to win.

The difference in this and in other respects between the photographer and the painter was recognised by the Royal Commission, who themselves recommended the proposed difference of terms in the following words:—

"We therefore propose that the term of copyright for all works of fine art other than photographs shall be the life of the artist and 30 years after his death." [C. 95.]

"Photographs, however, present some difficulty. At the present time they are coupled by Act of Parliament with paintings and drawings, and are subject to the same law; but as we have before pointed out, we believe this circumstance arose merely from the fact that before 1862, when the Act was passed, there was no copyright protection for either of these subjects and it was then thought right that photographs should be protected as well as other works of art. On consideration, however, it will be seen that photographs are essentially different from paintings and drawings, inasmuch as they more nearly resemble engravings and works of a mechanical nature by which copies of pictures are multiplied indefinitely." [C. 118.]

"We propose that the term of copyright in photographs should be 30 years from the date of publication." [C. 119.]

But it must be asked, Does the proposed extension of terms to the artist do injustice to any one? At present photographs have life and 7 years of the operator, the engraver 28 years, the caster from nature 14, and a possible other 14 years. It is proposed to give to each a fixed term of 30 years. At present the photographer has an uncertain term, which may end in 7 years and a day, and I am not aware that any one has objected that the term of 30 years is not as good, if it be not better, than the uncertain life of the operator and 7 years. With the other two cases the term is an actual extension on what they now enjoy. In considering this question it is well to look abroad and see how it is dealt with in other countries.

In France the artist has a copyright for his life and 50 years. A photograph has not of necessity a copyright at all; but, if it can be shown that it is artistic in its character, it can claim protection as a work of art. In Germany, Austria, Hungary, Norway, Sweden, Denmark, Spain, Portugal, Switzerland, the artists' term varies from life and 20 years to life and 50 years. The term for photographs is a uniform one of 5 years only.

Registration in the next important matter dealt with in the Bill. The primary object of this is to afford information to the public as to the ownership and duration of copyright. Under the present Act, the owner of a copyright must register if he wishes to take proceedings for an infringement; but in practice a large number of copyrights go unregistered. The public, who are unversed in the ins and outs of the law, do not understand this; and, indeed, those who do are in little better position. You want to find particulars as to some work, and you search the register, there is no entry. Knowing the condition of the law which causes so many copyrights to lapse, the presumption is that the work is within the "public domain"; and, if so, it is actually public property and any one may use it. At the same time, you know that if you do, it is at your peril, for an unknown and undiscoverable copyright-owner may suddenly appear out of space, and, having registered his work after your publication, may obtain an injunction and stop your work. Now, it must be manifest that to leave things at a loose end like this is fatal. Registration must either be abolished, and the public left without pretence of information, or it must be made compulsory. Once more one looks back to the report of the Royal Commission, and this is what we find:—

"We are satisfied that registration under the present system is practically useless, if not deceptive." [C. 137.]

"We have been satisfied by the arguments in favour of registration, that it is advisable to insist upon it, and that it should be made more effective and complete. To this end it should be made compulsory." [C. 138.]

This recommendation is embodied in the Bill.

But the Bill exempts from registration the copyright of an original work of fine art so long as it remains in the possession of the author; but, should he dispose of it, the person to whom it is assigned must register. The reason for this is simply that, as under the Bill the copyright is always vested in its author until disposed of, if there is no entry of a work the public will know that the copyright is still in the hands of the artist and will apply to him for information, and this method is made effective by the compulsion to register within six months after it leaves his hand.

But the onus of registration remains with photographers, engravers, and others who under the Bill have a fixed term of copyright. This becomes a necessity because this term starts from a certain date. Under the Bill it is date of registration, and the public have a right to know when that term begins and ends, and in England registration is the only accepted means of effecting this. In foreign countries a system is adopted whereby photographs have to be issued stamped upon the face with the name of the firm to whom they belong and the date of original issue, so that the public may see at a glance how many of its five years have expired.

There is a special reason why in the public interest photographs should have a fixed term which should be registered, a reason which does not apply to original works of fine art.

Under the present law the copyright of a photograph is vested in the operator for his life and 7 years; but, assuming that the copyright is registered in the name of the operator, what means has the public of knowing anything about him? He is an *employé*, unknown to the public, who passes maybe from the service of one firm to another, and passes ultimately away, and even the person who employed him may know nothing of his end. It is probable that at the present moment there are thousands of photographs upon the market in which copyright is claimed, the rights in which have long since expired under the terms of the present Act. The present Act is, and any Act giving life and a term of years to the photographic operator must be ineffective, owing to the conditions of the photographer's business. That this should be so is scarcely in the public interest.

Turning once more to the report of the Royal Commission, we find, after the proposal of compulsory registration:—

"We recommend that registration of paintings and drawings should not be insisted on so long as the property in the picture and the copyright are vested in the same person, but that, if the copyright be separated by agreement from the property in the picture, there should be compulsory registration." [C. 158.]

"With regard to such works as engravings, prints, and photographs We think that they should be subject to compulsory registration." [C. 159.]

I have put before you the main features of the Bill. There are others I can only mention:—

The Bill enables an American to secure copyright in this country. At present he cannot do so, while we can secure copyright in America.

It attempts to simplify and make clear the relation between an employer and his assistant, whether he be employed to make a photograph or to assist in carrying out a work of art, in which cases it is proposed that the copyright remain with the employer.

It defines more clearly the relation between the publishers who employ an artist to draw, or a photographer to photograph, for publication. It amends and strengthens the provisions for repressing the commission of fraud, and gives to the print-seller, the photographer, and fine art publisher, powers of which he has long felt the need, and for want of which he has been largely at the mercy of the pirates, viz., power of search and seizure of pirated copies in houses and shops, and on hawkers.

These are powers which were also recommended by the Royal Commission.

In so far as they can claim to be works of art, the Bill protects the drawings of the architect and the designs of the art worker in all materials. It does not directly concern itself with International Copyright, nor with the Berne Convention, though indirectly it touches both, and these subjects are far too wide for me to enter upon.

I have tried in the time at my disposal to give you a brief sketch of the rise and progress of artistic copyright, to show you the weak spots in the present state of the law, and the reasons for the chief proposals made in the new Bill now before Parliament. As a matter of fact, it is a subject which concerns pounds, shillings, and pence only, it is a mere question of business; and yet I know of no question into which more sentiment can be and is imported. And one knows what a weighty factor is sentiment. Its introduction, however, only interferes with a true perception of the real matters which have to be considered, but painters, and sculptors, and engravers, and perhaps I shall not be far out if I add photographers, have all a good deal of sentiment about them. Sentiment is a fine thing, it belongs to the highest in man, but it is out of place in such a mere matter of business as copyright. It is as a matter of business that the Bill will be dealt with by the Committee of the House of Lords, and as a business measure it will have to pass through the fire of criticism not only before the Committee, but before Parliament; and only if it can stand this test will the Committee which is answerable for its existence feel they have succeeded in that which was their main object in framing the measure.

EDWIN BALE, R.I.

In the course of the discussion Mr. T. E. Scrutton said he was the unfortunate draughtsman of the Bill before the House of Lords, and, having had the advantage or disadvantage on two occasions of being thoroughly cross-examined upon it by the House of Commons Committee, he had found the most extraordinary number of traps lurking beneath apparently the simplest language, and how possible it was for words which he thought were perfectly clear to be misunderstood in the most startling way by comparatively intelligent people. He felt, therefore, rather diffident in speaking about it, and it had been said that the worst possible person to interpret an Act was the person who draughted it. He, therefore, quite agreed with Mr. Basil Field that any discussion should deal not with details, but with the principles it endeavoured to carry out. Those principles were laid down for him by the Committee, and were, first, that the Bill should include every work of genuine art, making a broad distinction between original works of the higher arts and those which involved in the main mere reproduction, so that the author of a painting, an original statue, or an original engravings, should have higher

rights and a longer term than the man who merely used a Kodak, and went through the mechanical operation of copying, with the aid of light, some pleasing scenery. The second principle was that the present absurd chaos with regard to commission works should be swept away. At present, if he went to the Chairman, caught in a thoughtless moment, and bought a picture of him without anything being said about copyright, Sir Lawrence Tadema would have no copyright, nor he either, because nothing had been signed by one or the other, either reserving it to the artist, or transferring it to the purchaser, and so the copyright was lost entirely. This appeared to be the result of a series of amendments in Parliament, no doubt for the purpose of ensuring that, if members of Parliament had portraits of any of their families painted they should not be reproduced without their consent. The principle of the new Bill was that the copyright should remain with the artist, unless something in writing took it away from him, but with this protection to the purchaser, that the artist could not reproduce it without the purchaser's consent. In that way the artist retained control and would be spared the pain of seeing his work used as an advertisement of somebody's soap; he would be able to control the forms of reproduction, but would not be able to circulate against the wish of the purchaser reproductions so like the original that two purchasers might stand and discuss which was the original and which the copy. The great difficulty with the Bill was that the tribunal which would settle the Bill were not artists, but gentlemen who had portraits painted, and who approached the subject from that point of view. Artists were unanimous as to the desirability of some such provision, but Parliament was a tribunal which would probably take the opposite view, and he had no doubt that the most serious difficulty would be with the clause relating to commission works. Another important principle involved was that affecting registration. The present system was a ridiculous sham; it did not really enable the public to know whether a work was copyright or not. After looking at the volumes at Stationers' Hall and finding no entry, a firm might issue an elaborate book at great expense with reproductions, and next day find themselves stopped by an injunction. The system was extremely technical, and when he had the honour of appearing for pirates, as he sometimes did, the first thing was to see if any fault could be found with the registration, and very frequently it could. An elaborately technical system lent itself to ingenious pirates. Another difficulty was the absurd complexity of the various Acts. Under the Art Act you must register before the infringement complained of or you could not sue; in the case of a book you could register the day before the issue of the writ. If registration was intended to protect the public, it did not do so; and, if it was intended to protect the artist, it failed, on account of the technicalities. You might sweep away registration altogether, and say that any one who copied a picture did so at his own risk; that would not hurt the artist, but it might hurt the enterprising gentleman who stood between him and the public—the publisher, who generally knew his way about Stationers' Hall, and it might hurt the public more than the present system, as it would make it more difficult to know whether they were getting a copyright picture. The other system would be to make registration effective by making it compulsory, and that the Bill proposed. The public would then know, by inspecting the register, whether a work was copyright or not, unless it remained still in the hands of the original artist, of whom they could then inquire. The Bill had roused a great outcry from photographers, who asked why they should be required to register every photograph they took; why could they not wait until somebody copied it? He had not much sympathy with the photographers in this matter, because they were getting far more protection than was accorded them in any other country in Europe, where the term was generally five years, and in some they had to show that the photograph was an artistic production, which would cut out a great many altogether. This Bill proposed to give them thirty years, and for that extension, and for the money they might get from the illustrated papers in consequence, he did not think they could complain of having to tell the public that they claimed the copyright. The other matter in which the Bill made an advance was that it rendered it more easy to stop infringement. Some gentlemen present knew how difficult it was to stop piracy. There were three well-known firms in Jersey, where the Art Copyright Act was not in force, which made photographs of any number of copyright pictures, which they sent to England through the post. He had seen an admirable series of photographs of the Chairman's works. The Post-office would not stop them unless you gave information—which you could not do—what packets contained copyright infringements; and it was the same with the Customs, they required to have a copy of the original supplied to them, and also information as to what packages to search. The result was that, both by post and through the Customs, large quantities of these piracies were sent to England. The people who imported them were known, but there was no power to search or seize until they began to sell. Of course, they did not open a shop; they got a gentleman of no particular occupation, name, character, or residence, and sent him about the country with a basket containing other wares, and he called at city offices, and at the backdoors of houses, and sold these pictures one by one at about a tenth of the price at which they could be legitimately obtained. If, by chance, you caught him selling a copy, you could issue a writ, and you might be able to serve

it on him, and then in the course of a few months you would get an injunction to stop him; but where would he be then? He would be miles away, and would probably have transferred his stock to another gentleman of equal substance, against whom you had to begin *de novo*. This trade, which was followed both with regard to art and music, it was impossible to stop without an enormous expenditure of time and money. The present Bill endeavoured to meet that by giving power to stipendiary magistrates to grant a search warrant, and to police constables, armed with such a warrant, to seize piratical stock in trade. From his practical experience he believed these simple expedients would be found very effective. Those were the main features of the Bill, and he predicted for it rather a stormy life, both in Committee and in the House. The photographers were up in arms against it, the process engravers had a good deal to say, and the only people perfectly satisfied with it, as far as he knew, were the Royal Academy and the painters and sculptors. It had to go before a tribunal of country gentlemen who had their portraits painted, and he feared it would be difficult to get it, in its present form, through such a tribunal. It had been very carefully considered, and he could only hope that it would pass without alteration. However altered, it could not be worse than the present system, and he sincerely trusted that, when it became the law of the land, it would confer great benefits on artists, and justify the labours of the Committee in preparing it, and the Royal Academy in promoting it.

THE BIRMINGHAM EXHIBITION.

OUR impression of the Fifteenth Annual Exhibition of the Birmingham Photographic Society, which has been open to the public this week, is that it excels its immediate predecessor in point of average quality, although it must be admitted that it would be no light task to back up the faith that is in us by actual demonstration. But, quitting matters of impression for those of fact, it is significant of the rapid march which pictorial photography has made at Birmingham that at the Society's Annual Exhibition the members themselves supply a collection of work which is as good as we are accustomed to see at a first-class London exhibition. Nay, it must be admitted that, from whatever point of view it is regarded, the present Birmingham Exhibition challenges comparison with both the last Exhibitions in Pall Mall and Piccadilly. Leaving the Open Section out of the question, that filled by members contains photographic work by Messrs. J. Page Croft, F. A. Bolton, W. Smedley Aston, G. Wilkes, and others, which is of the highest excellence, and quite as good as the best we are accustomed to see in London in the autumn.

Our inspection of the photographs on the wall of the fine circular gallery of the Royal Society of Artists, in New-street, preceded the declaration of the Judges' awards, more than two-thirds of which we anticipated. We mention this little fact to support our remark that long experience in the inspection and judging of photographs enables us not only to single out the kind of work which finds judicial favour, but also to pursue the trend of the fashion, if we may so express ourselves, amongst prominent exhibitors. At Birmingham, last week, we distinctly perceived evidences of Mr. Alfred Stieglitz's influence having been at work. It will be remembered that at the last Pall Mall Exhibition that gentleman received an award for a dainty little sketchy portrait, head in platinum and a somewhat similar subject by Mr. J. Page Croft (a prolific exhibitor) is successful at Birmingham. Mr. Cruxwys Richards also appears to us to be under this influence when he is not directly imitating the painters in their effects on canvas. A portrait of the latter description so pleased the Birmingham Judges that it was medalled. Mr. Herbert Waters, and Mr. Pierre Dubreil were also successful with work of a similar kind. It must be owned that delicately rendered photography of the nature we are referring to separates itself from its more vigorous surroundings in the way of architectural interiors, highly contrasted landscapes or seascapes, or forcible portraiture of the Dudley Hoyt description, and by its low tones and quietness of effect commands an amount of notice and attention denied to other photographs of a more familiar type.

As we have remarked, the Members' Open Class was a strong one, and amongst the eighty or so examples we were pleased with the exhibits of, besides the gentlemen named, Messrs. G. Wilkes (his No. 60 was a very graceful portrait study), W. P. W. Browne, and F. A. Bolton. The Messrs. Peach show some large and striking work; but No. 68, a study of a man's head, is a crudely illuminated production which offends the eye. So, too, the lurid red tones of Mr. Page Croft's *Melody* (No. 7) "rise up" against one. The winding path in *A Weary Road* (No. 27), by Mr. Hugh Lewis, has a peculiar ribbon-like effect, the reverse of pleasing. But there is little to find fault with and much to applaud in the section, although, truth to tell, there is not a great deal that is out of the common in it.

Coming to the Open Section, we thought Mr. Topham's idea of *Babes in the Wood* (No. 88)—two uninteresting-looking children in a snowy wood—a rather poor interpretation of the nursery tale. The bluish tone of *Leafy June* (No. 91), by Mr. W. E. Dowson, is not suited to such a subject; something suggesting sunniness is needed. So, too, Pierre Dubreil's *Niège au Bois* (No. 181), a number of broad tree trunks of the

colour of the frame and against a snowy background—nothing more absurdly commonplace could be imagined. "A ha'porth of picture and an intolerable deal of mount" is the paraphrase of Falstaff, that occurred to us when contemplating Mr. Smedley Aston's *Ram Hall Farm* (No. 232), in which this distinguished worker gives us a little view about midget size on something like a 15 x 12 mount. Justification for eccentricities of this kind is not easy to supply.

With these few grumbles we must pass a word of commendation to many strikingly good pictures in the section by Messrs. R. S. Webster (portraits); J. Kearney, jun.; T. E. C. Wilson (sheep study); W. Illingworth (a very fine study of the head of a tramp); Wm. Rawlings; J. Page Croft (some excellent portraiture); Dudley Hoyt (portraits); W. T. Greatbach (this able worker being represented in many moods); H. C. Leat (for a singularly effective study of a lamp-lighter at work); W. Smedley Aston (Mr. Tree as King John, giving him the opportunity of excelling in a bit of theatrical portraiture); Bernard Moore (with a really beautiful and realistic study of reedmen, presumably in Norfolk); Alexander Allan; C. F. Inston (his Pall Mall pictures were hung at Birmingham); and R. N. Speight (an old fellow cautiously lighting his last match). Good architectural work comes from Messrs. Bland and Burkinshaw; and some Parsee studies from Mr. Bhedwar. But the chief triumphs of the section are earned by Messrs. Page Croft, Greatbach, and Smedley Aston. The first-named is perhaps unequal in his exhibits, but the others show some of the most charming landscape and portrait studies we have recently seen; indeed, their versatility is nothing short of astonishing.

Great pressure on our space this week obliges us to abbreviate our remarks, but we may note that there was a capital loan collection on view—a section open to members not hitherto successful in competitions, Warwickshire survey collection, and a small exhibition of apparatus. We must congratulate the Society on having organized a very fine Exhibition indeed, and to have simplified its classification. One year, if we remember aright, there were no less than twenty-two classes; this year there are practically only three—a distinct change for the better.

The following is a complete list of the awards made by the Judges, Messrs. Crooke, Wainwright, and Wellington:—

MEMBERS' SECTION A.

Silver medals, *A Sussex Shore*, Mr. W. Smedley Aston; *Toward the Western Sea*, Mr. Francis A. Bolton. Bronze medals, *The Lonely Margin of the Sea*, Mr. Francis A. Bolton; *Study of a Head*, Mr. J. Page Croft; *Fading Day*, Mr. W. Smedley Aston. Certificates, *The Picture-book*, Mr. W. Smedley Aston; *A Remnant of the Past*, Mr. H. J. Yates; *4 Syren*, Mr. J. P. Croft.

MEMBERS' SECTION B.

Open to Members who have never taken a Prize (Insets of Three Prints).

Silver medal, Mr. George Whitehouse. Bronze medal, Mr. A. C. Scrivener. Certificates, Messrs. George Whitehouse and P. B. Rider.

OPEN SECTION.

Silver medals, *A Thames Tramp*, Mr. Hubert Waters; *A Stormy Sunset*, Mr. W. A. J. Hensler; *Words of Comfort*, Mr. Alexander Allan. Bronze medals, *Sentinels*, Mr. J. Page Croft; *J. H. Henshaw (untouched head)*, Mr. Thomas Lewis; *Old Ann*, Mr. Alexander Allan; *The Day's Work Nearly Done*, Mr. W. T. Greatbach; *The Ford*, Mr. W. T. Greatbach; *After Mucha*, Mr. Heath John Haviland. Certificates, *Study of a Tramp*, Mr. W. Illingworth; *Portrait*, Mr. J. Cruwys Richards; *Eventide*, Mr. J. Cruwys Richards; *The Last Match*, Mr. R. N. Speight; *Portrait*, Mr. J. Cruwys Richards.

LANTERN SLIDES (SETS OF SIX).

Silver medals, Dr. J. W. Ellis and Mr. John Gunston. Bronze medals, Messrs. C. S. Baynton and John Beeby (New York). Certificate, Mr. J. Kearney, jun.

Our Editorial Table.

THERE is one fault that we must urge against the *Illustrated Annual of Microscopy* for 1900 (published by Messrs. Percy Lund & Co., Amen Corner, E.C.), and that is the omission from the title-page of an editor's name. The anonymous compiler has done his work excellently. Microscopists and photo-micrographers will find in the book a number of beautifully illustrated articles on those two branches of study to which we can scarcely render sufficient justice in this brief notice; we may, however, indicate a contribution by Mr. E. R. Turner on stereo-photo-micrography, chromo-photo-micrography, and stereo chromo-photo-micrography, as pointing to comparatively untrodden fields in photo-micrography.

IMPRESSIONS OF AMERICA.

By T. C. PORTER, M.A. With Diagrams and Stereoscopic Views. 240 pp., price 10s. 6d. London: C. Arthur Pearson, Limited, Henrietta-street, W.C.

In a paper read at the Gloucester meeting of the Photographic Convention of the United Kingdom last July, the subject of binocular vision and the stereoscope was briefly touched upon by the Editor of this JOURNAL.

Simple directions were given for controlling the accommodation of the eyes so as to enable stereoscopic pictures to be seen binocularly without a stereoscope, and, amongst other things, the suggestions were made that young children might advantageously be taught to develop this power over the ciliary muscles, and that, in course of time, our books might, to a very large extent, be stereoscopically illustrated. These suggestions provoked the jeers of a contemporary writer, who, it is only charitable to suppose, was ignorant of the fact that so far back as 1853 the late Professor Piazzi Smyth produced a book stereoscopically illustrated, and that, moreover, the construction of the human eyes admirably lends itself to the very slight amount of muscular effort demanded by their conversion into what may be termed a non-magnifying stereoscope.

Oddly enough, Mr. Porter's book was published about the time the paper above referred to was read, but until this moment no opportunity has come to us of giving it detailed reference in our pages. To photographers Mr. Porter's readable account of his American holiday and the data about some natural phenomena which it enabled him to collect will probably prove of less interest than the preface and the illustrations. The former gives very full instructions as to how the pictures may be seen in relief without the aid of a stereoscope, and we must congratulate Mr. Porter upon having gone so thoroughly into the matter. His directions are sound and practicable. We, however, are of opinion that his method of seeing lantern pictures in relief by projecting the two halves of a stereoscopic transparency out of register—necessarily so, of course—and regarding them with crossed axes, is open to objection on the ground that strabismus might possibly result in some cases. But this is a minor matter.

There are about forty stereoscopic illustrations in the book, reproduced in fine-grained half-tone, which, if not so suitable for the purpose as collage type, yet answer in this instance exceedingly well. Mr. Porter knows how to take a binocular photograph which shall give a good effect, and we have examined his views with much pleasure. A little stereoscope is supplied with the book, which, both on general as well as particular grounds, we can recommend to photographic readers. We hope to see it soon followed by other volumes illustrated in a similar manner.

THE PHOTOGRAPHER'S NOTE BOOK.

By SIR DAVID SALOMONS, Bart., M.A. London: Marston & Co., Soho-square. To the revised edition of this little book some additions have been made by the author. Besides many pages for recording particulars of exposure, the data relating to enlargement calculations, depth of focus, and rules for exposure will be found of permanent practical use. It is entirely a well-edited little book which the photographer will find as trustworthy as it is handy.

To the Riviera and Italy for a 10. Note is the title of a neat phototypically illustrated little pamphlet, telling the traveller in search of sunshine how to reach that "better land" which the rigours of the English winter and spring compel so many of our fellow-countrymen to fly to (temporarily) every year. It is issued under the auspices of the London, Brighton, and South Coast Railway Company.

THE Vanguard Manufacturing Company, of Maidenhead, send us a quantity of their meto-quinol developer (which we tried in the development of some bromide paper with most pleasing results), put up in a bottle with a screw stopper specially devised for the purpose after considerable experiment. This stopper is deficient in the vices of ordinary stoppers, corks, and so forth, and possesses the supreme positive virtue of knowing its place and keeping it. It comes as a boon and a blessing in many respects, and not least as an obviator of bad language in the dark room; hence we accord it a hearty welcome.

WITH an intimation that applicants for copies may have them free of charge, Messrs. Mawson & Swan, of Soho-square and Newcastle-on-Tyne, send us a little book relating to the use of their dry plates and films. It contains numerous half-tone illustrations from negatives made on those justly renowned sensitive surfaces, one of them on a plate sold in 1884 and exposed and developed in 1898. Judging by the picture, the negative was perfect, and we do not think the well-known Castle plate could receive a better testimonial than the fact of some of that brand having kept well for the long period of fourteen years. The booklet also contains developing formulae, useful hints and notes, and pirections how to make transparencies for the lantern. Another little book which will be found useful in recording notes of exposures accompanies it, and, as we have said, the two are sent post free to applicants.

Studio Gossip.

A WELL-KNOWN artist went to a "book-tea" lately, wearing on his coat two photographs, one of Sir Blundell Maple, the other of Sir Thomas Lipton, and round his neck was hung a string, to which were fastened two old teeth. The meaning was *New Men and Old Acres*.

AN ERRAND BOY SENT TO A REFORMATORY.—At the Leeds Police-court, on Friday last, Harry Eaton, a lad of fourteen, residing at 4, Upper Bell Hall,

Halifax, was charged with having stolen a bag containing cash, cheques, and postal orders, the property of Messrs. James Bacon & Sons, photographers, 149, Woodhouse-lane, Leeds, by whom he was employed as errand boy. It appeared that he had only been in the service of the firm three days when he stole the money, that had been left in a drawer for banking purposes. He was subsequently arrested at Keighley. The prisoner pleaded guilty, and was sent to the Adel Reformatory until he was nineteen years of age.

MRS. CHAMBERLAIN, says the writer of an article on Mr. Chamberlain in the *Universal Magazine*, has a strong objection to her photograph being sold or exhibited in shop windows. An instance is on record of a Birmingham tradesman, who, soon after her marriage, introduced Mrs. Chamberlain's photograph into one of his advertisements, but who received a peremptory order from Mr. Chamberlain's solicitors to instantly withdraw it. Mrs. Chamberlain accompanies her husband on all his political missions, and takes a great interest in everything in which he is concerned. She is an admirable hostess, and, moreover, is a great favourite with the Queen, who has more than once shown her special marks of favour.

FIRE.—Early on Saturday morning an alarming outbreak of fire was discovered in the studio of Mr. Edward Kraus, photographer, of 2, Werter-road, Putney, and, had it not been for the timely assistance of the fire brigade, would have resulted in a disastrous conflagration. The cause of the outbreak has not been ascertained, but when Mr. Kraus retired to rest on the Friday night there was not the slightest sign of fire, and he was even working in the studio until a late hour. About three a.m. on Saturday, he was aroused by the presence of smoke in his bedroom, and on rushing downstairs he was greatly astonished to find his studio in flames. The police were at once called in, and they rendered valuable assistance, but, if it had not been for the arrival of the Battersea and Wandsworth fire brigade shortly afterwards, the effects of the fire might have been disastrous. The brigade soon got the flames under, but a considerable amount of damage was caused to the apparatus. The premises are insured in the Liverpool, London, and Globe Insurance Company.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 7, at eight o'clock, "Electric Printing without Ink, and one of Colours Enigmas," by Mr. W. Friese-Greene.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Thursday, March 8, Lantern Night. Visitors are welcome at the White Swan, Tudor-street, E.C.

THE TWENTIETH CENTURY PHOTOGRAPHIC EXHIBITION.—M. Welford desires us to announce that he has arranged with Mr. F. Goddard, Hon. Secretary of the South London Exhibition for the prompt dispatch of exhibits from Camberwell to Birmingham, so that the same pictures can be entered at both Exhibitions.

The Exhibition of the South London Photographic Society will be opened by Mr. G. C. Whiteley, M.A., M.L.S.E., at the Public Baths, Church-street, Camberwell, S.E., on Saturday next, and will remain open until Saturday, March 10, when the awards made by Messrs. Bayley, Bedding, and Wall will be distributed at eight p.m.

At the last meeting of the Croydon Camera Club, Mr. B. E. Edwards announced his discovery of the useful property possessed by borotartrate of potassium, if added to a developer, in preventing over-contrast, for which purpose he advised a few drops of a ten per cent. solution should be added to each ounce of developer. Development is retarded by the above. An excess will entirely prevent any density.

A YEAR or two ago, says a daily contemporary, a tourist from Baltimore, while in Alexandria, purchased a mummy in a case, and took it home to the States with him. Lately, wishing to assure himself of the genuine character of his possession, he subjected the swathed figure to the Röntgen rays, when it was found to lack a skeleton. Tearing the mummy open in disgust, he found, besides straw and shavings, and English, French, and Egyptian newspapers of ten years ago, a ticket of admission to the British Museum Reading-room, which is dated 1880!

MR. ROBERT H. SCOTT, who has been thirty-three years in the Meteorological Office, retired from the position of Secretary to the Council on Wednesday last. His successor is Mr. W. N. Shaw, a present member of the Meteorological Council. Mr. Shaw is a Fellow of Emmanuel College, Cambridge, and has for some time been Assistant Director of the Cavendish Laboratory, and Lecturer on Physics at the University of Cambridge. Mr. Scott will retain the Hon. Secretaryship of the International Meteorological Committee, which he has held for twenty-five years, until the next meeting of the Committee in September.

THE RÖNTGEN SOCIETY'S future arrangements are : April 5, Dr. Norris Wolfsen and Dr. Forbes Ross, "The Influence of the X Rays upon the Growth and Development of Micro-organisms." May 3, Dr. Dellpratt Harris, a short paper, "On a Form of Focus Tube Designed to be Self-heating." This is to be an Exhibition evening. Smoking will be permitted. Tea and coffee will be provided. Members are invited to bring skiagrams, or other objects of interest ; but, if requiring more than a few minutes' description, to communicate previously with the Hon. Secretary, Mr. F. Harrison Low, M.B., 12, Sinclair-gardens, W.

At the Public Hall, Reigate, on Tuesday, March 13, in aid of the Transvaal War Fund, Mr. Henry Speyer will repeat his lecture, "Round about the Matterhorn and Aletsch Glacier," illustrated by 150 original photographs, which will be shown under the lantern management of Mr. William Brooks, President of the Redhill and District Camera Club. The chair will be taken by Mr. J. Topham Richardson, at 8.30 p.m. precisely. The bills announcing Mr. Speyer's lecture are appropriately enough printed on khaki-coloured paper. Mr. Speyer's first lecture on behalf of the Redhill and District Camera Club resulted in a net profit of 16/- 7s. We wish him even greater success in his efforts to benefit the War Fund.

WE regret to have to announce that Professor Charles Piazzi Smyth, late Astronomer Royal for Scotland, which office he filled for forty-three years, died last week at Ripon, at the age of eighty-one. He began his astronomical career at the Cape of Good Hope sixty-five years ago, afterwards assisting in the remeasurement of La Caille's South African Arc of the Meridian. When appointed to his Scottish post, he set himself to clear off some five years of arrears of work in computation. In 1859 he visited the Russian observatories, and made a report upon them. The work by which he is best known is *Life and Work on the Great Pyramid*. In August 1888 he retired to Ripon, where he devoted himself to spectroscopy and to the study of cloud forms. In former years Professor Smyth was a frequent and valued contributor to this JOURNAL and its ALMANAC.

ROYAL PHOTOGRAPHIC SOCIETY.—Applications for Fellowship will be received by the Admissions Committee on Wednesday, March 7. The following are the regulations which have been drawn up by the Council to govern the admission of Fellows: Admission is by the Council. Applicants must first become ordinary members of the Society. It is desirable that a candidate should furnish the names of one or more members of the Society to whom he is personally known. Every application shall be accompanied by a statement of the qualifications of the candidate in relation to one or more of the following heads: Important contributions to photographic knowledge, either in theory, practice, or invention ; the production of notable work, either in pure photography or in the arts and sciences kindred thereto ; work done in disseminating photographic knowledge ; any public service tending to the advancement of photography. The heads specially dealing with students, as follow: The student must show, to the satisfaction of the Council, that he has received a suitable general education, and that he has a good knowledge of photography in general, or at least a fair knowledge of the general subject and a special knowledge or experience in one or more of its branches. As to general education, the Council suggest the following examinations: The matriculation, preliminary, or entrance examinations of the various universities and colleges, the Oxford and Cambridge local examinations, the higher examinations of the College of Preceptors. In photography and allied subjects the Council suggest the examination of the City and Guilds Institute in photography, especially the Honours stage, the examinations in chemistry, physics, drawing, painting, and other allied subjects, held by the Department of Science and Art, and the various educational bodies. Forms of application and all information may be had on application to the Secretary, 66, Russell-square, London, W.C.

Commercial Intelligence.

SECCO FILMS, LIMITED, of 39, Lombard-street, inform us that they are now stocking films in cut sizes from quarter-plate to 15 x 12, and on spools for daylight loading cameras.

We are sorry to learn that Mr. F. Parsons (Messrs. Hinton & Co., Bedford-street) has been laid up for about the last three months with rheumatic gout. He is now getting better, although two or three weeks will elapse before he can return to business.

THE decimal and metric systems of weights and measures are reported to be in use all over Brazil, and are employed throughout the tariff. Weights are always calculated in kilos. Measures vary according to the article, some being in English yards, others in metres, and others in Portuguese varas. When the English system is adopted in invoicing, it is stated, in a report on matters of commercial intelligence relating to Brazil, to be generally advantageous to give equivalents in the decimal system for Custom-house work and other purposes.

THE KODAK IN WAR.—In an interview with a representative of the *Daily Mail*, the Manager of Kodak, Limited, said that the war had caused a very marked demand for cameras and materials. Officers, as well as correspondents, took out cameras as a matter of course, and, although the war had to some extent thrown back the export business with South Africa, it had more than compensated for such loss. The Kodak Company had supplied innumerable outfits, and had a large collection of pictures sent home from the front by delighted amateurs. By means of the "daylight changing cartridges," men at the front had been able to secure dozens more pictures than would be possible with the ordinary plate. The number of pictures sent home was so large that the Kodak Company would have a practically complete story of the war, both in Natal and Cape Colony, in pictures. In fact, they had photographs of the troops from the time they went aboard ship at Southampton.

GLASS-MAKING IN HOLLAND.—According to native historians, the glass history of Holland dates back to the sixteenth century, and it is said that in that early day it had assumed large proportions. No trustworthy statement regarding this old-time industrial development exists, and authorities on the glass industry outside of Holland have failed to make record of any extensive manufacture in this line in that country. Delft ware, Hollands gin, linen, and Dutch paper have all been well known for centuries, and it is known that, for at least over 100 years, some very miserably made semi-green vials have been sold all over the world containing Haarlemensis and Haarlem oil ; and for more than a century home-made bottles have been exported containing Hollands gin ; but there is no reliable record of the existence of any bottle factory previous to the eighteenth century, and old Holland glassware is conspicuous by its absence. To-day, however, besides the plate-glass works in operation and the existence of several silvering and bevelling establishments, there are thirteen furnaces in operation producing flint and green bottles, nine of them being in Zuid-Holland, three in Geldern, and one in North Holland. Most of the bottles are used by the home distilleries, and are largely exported with domestic liquors. Some of the factories are excellently equipped and able to sell their ware in competition with French and German bottles, though some few of them are unable to cope with imported bottles, and are partially idle, except in seasons of excessive demand. There are four table-ware factories, one each in Maestricht and Leerdam, the product of which is equal to

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foreign ware imported. Brown cylinder and bent glass is made in Dordrecht, Utrecht, and Haarlem; about 3000 workmen are employed, and the annual value of the product is about 3,000,000 gulden, about 1,000,000 den-worth of which is exported.

A PECULIAR CLAIM.—In the Queen's Bench Division of the High Court before Mr. Justice Ridley and a special jury, the case of *Ellis versus Eyre & Sons* came on for hearing. It was an action to recover damages for breach of contract and commission earned. The defendants denied that they had broken the contract, and counter-claimed for 51*l.* 14*s.* 11*d.* moneys advanced to the plaintiff. Mr. Witt, Q.C., in opening the plaintiff's case, said that the plaintiff had been employed by the defendants as a photographer for many years. In 1898 the plaintiff conceived the idea of photographing works of art abroad. In March 1898 an arrangement was entered into between the plaintiff and the defendants for the plaintiff to go abroad with photographs of pictures in our galleries, and obtain orders for them, also getting the permits. Went abroad and spent 50*l.* in getting the permits. The plaintiff then proposed that he should photograph a series of pictures in the Louvre and in the galleries of Brussels and Antwerp, and that the defendants should pay him 2*s.* for every negative he took. The negatives were to be 12×10 inches, and the agreement was to last for five years. On April 6 the plaintiff had an interview with the defendants' manager, and terms were discussed, the plaintiff saying that it was necessary that the defendants should push the sale of photographs abroad. An agreement was drawn up whereby the plaintiff was to get 1*l.* 11*s.* 6*d.* for every negative, and a royalty of ten per cent. upon sales of his photographs abroad. The plaintiff signed the agreement, believing that the defendants would push the sale of his works. The work on the continent cost the plaintiff 110*l.* The defendants said they were not bound to push the sale of the photographs. Mr. Bray, Q.C., for the defendants, said it was intended to add to the written agreement an implied obligation to send a letter out. The defendants never sent travellers out. They had appointed an agent in Paris, and sent circulars out to agents abroad. Mr. Justice Dely said there was no proof by the plaintiff that the defendants had not pushed the sale of the photographs, even assuming that there was an implied obligation on the defendants to push the sale, and there must be judgment in favour of the defendants on the claim and counter-claim, with costs.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
.....	Bradford Photo. Society	{ Winter Sports in Norway. Howard Priestman. Platinotype Process. A. Horsley Hinton.
.....	Cripplegate Photo. Society	Demonstration: Lantern Slides. A. J. Kay.
.....	Glasgow and West of Scotland	Demonstration: Carbon Printing. Chas. J. Kirk, F.R.P.S.
.....	Kingston-on-Thames	{ A Visit to South Africa. Slides lent by the Union Steamship Company, Ltd. Lantern Evening and Members' Slide Competition.
.....	Southampton	Elementary Technical Instruction Meeting: Use of the Society's Apparatus for Enlarging, Reducing, and Copying Work.
.....	Stafford Photo. Society.....	The Evolution of a Picture. J. H. Gear, F.R.P.S.
.....	Bristol and West of England	Demonstration: Lantern-slide Making. Messrs. Morris and Rayner.
.....	Brixton and Clapham	Hackney
.....	Gospel Oak	Annual General Meeting.
.....	Hackney	Demonstration: Ferguson's Method of Toning Bromide Prints with Copper. John Sterry.—Snowdon in Winter. Henry Speyer.
.....	Redhill and District	{ Some Beauty-spots of English Scenery. J. A. Hodges. London's Great Playground—Epping Forest. H. T. Malby, F.R.P.S.
.....	Royal Photographic Society	Colour Photography. J. Tudor Cundall, B.Sc. (Lond.).
.....	Borough Polytechnic	Electric Printing without Ink, and one of Colour's Enigmas. W. Friese-Greene.
.....	Edinburgh Photo. Society	Exhibition of Work contributed by the National Photographic Record Association. Introductory Address by Sir Benjamin Stone, M.P.
.....	Photographic Club	{ London's Great Playground—Epping Forest. H. T. Malby, F.R.P.S. Colour Photography. J. Tudor Cundall, B.Sc. (Lond.).
.....	Royal Photographic Society	Electric Printing without Ink, and one of Colour's Enigmas. W. Friese-Greene.
.....	Southsea	Exhibition of Work contributed by the National Photographic Record Association. Introductory Address by Sir Benjamin Stone, M.P.
.....	Woodford	{ Some Beauty-spots of English Scenery. J. A. Hodges. London's Great Playground—Epping Forest. H. T. Malby, F.R.P.S.
.....	Darwen	Colour Photography. J. Tudor Cundall, B.Sc. (Lond.).
.....	Liverpool Amateur.....	My Printing Methods. A. Horsley Hinton.
.....	London and Provincial	Demonstration: Secco Films. The Secco Films Company.
.....	Ashton-under-Lyne	Norway. W. Mallinson, B.A.
.....	Borough Polytechnic.....	Lantern Night.
.....	Bristol and West of England	Elementary Photography Class.
.....	Croydon Microscopical	Practical Evening: Photography by Night. Portraiture. Harold Baker.
.....	Whitby	Prize Slides.
.....		Lecture by Member of the Club.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 27.—Technical Meeting.—Mr. T. R. Dallmeyer, F.R.A.S. (President) in the chair.

ELECTION OF OFFICERS.

The HON. SECRETARY (Major-General Waterhouse) announced that the Council had elected Mr. J. A. Hodges as Hon. Secretary, Mr. Horace Wilmer as Hon. Librarian, Sir W. de W. Abney, K.C.B., as Hon. Editor of the

Journal, and Mr. Francis Ince as Hon. Solicitor; and that Mr. W. Thomas had been appointed to fill the vacancy on the Council caused by the election of Mr. Hodges as Hon. Secretary.

AFFILIATION.

It was also announced that Messrs. A. Mackie, H. Vivian Hyde, and Snowden Ward had been appointed delegates to represent the Society on the Affiliation Committee; and that the Bromsgrove School Photographic Society had been admitted to affiliation.

THE FORTHCOMING EXHIBITION.

The HON. SECRETARY stated that the Selecting and Hanging Committee, in connexion with the Exhibition of 1900, had been constituted as follows:—
Pictorial Section: W. Thomas, A. Mackie, F. C. Lambert, H. Vivian Hyde, J. C. S. Mummary, J. A. Sinclair. *Technical Section*: W. B. Ferguson, Q.C., Gen. Waterhouse, E. Sanger Shepherd, J. J. Vezey, E. J. Wall, F. A. Bridge.

ANOTHER COLOUR PROCESS.

MR. FRIESE-GREENE showed the results of some preliminary experiments in connexion with a new method of colour photography. He had made discs comprising red, green, and blue sectors, either of coloured glass or of cells containing suitable dyes, the colours and the size of the sectors being arranged in accordance with Clerk-Maxwell's curves, and had exposed plates in the camera while the discs were rotated in front of the lens, and lantern slides from the negatives so produced were projected with the rotation of a similar set of sectors in front of the projecting lens. He claimed that the results showed colours fairly approximating those of the originals, the subjects being tiger lilies and other flowers, a stained-glass window, and a sunset cloud effect. It appeared that the same sectors were used both in taking the pictures and projecting them, and that sectors suitable for one subject would not be suitable for another; but Mr. Friese-Greene said the process was as yet quite in its infancy, and he expected to be able to devise a standard colour disc which would be universal in its adaptation and capable of the most satisfactory performances. In the course of a conversation which took place later in the evening, the process was rather severely criticised, and he was the victim of a good deal of heckling, but he said he was not unused to the adverse reception of early ideas with regard to an invention which had been received years afterwards with popular approval. He quoted some of the remarks which were passed upon his introduction of animated photography, of which he was admitted to be the originator, and caused some amusement by repeating the views which were expressed at that time by a member who had taken part in the heckling on this occasion.

ELECTRICITY AND PHOTOGRAPHIC ACTION.

MR. FRIESE-GREENE then gave a demonstration of certain phenomena in connexion with the effects of electricity upon the action of the photographic plate. He mentioned incidentally that, in preparing solutions of developing agents for the purposes of experiments in this direction, he had been unable to make a metal solution of more than five per cent., but he had found that, by taking a twenty-five per cent. solution of pyro, he could dissolve in it twenty per cent. of metal. One drop of this mixture to two ounces of water, with one drop of ammonia 880, formed an exceedingly energetic developer. He had made experiments with every developer he knew, and found that all of them acted electrically. A piece of paper having been dipped for a minute in a ten per cent. solution of, say, adurol, and surface-dried, was placed upon a metal pad connected with a battery, and a coin was connected with the other pole of the electrical apparatus, and pressed in contact with the paper, which almost immediately showed a print of the coin. A dry plate, if left in contact with this print for a minute, also received a developable image of the coin, even though the plate had previously been exposed to light, and a similar result was produced if the reverse side of the paper was in contact with the sensitive film, and this could be done repeatedly with the same paper print. Mr. Greene also showed the method of electrical inkless printing, by means of which impressions are made from stereo blocks without ink or rollers.

COMING EVENTS.

March 6, Lantern Evening, "Some Beauty-spots of English Scenery," by Mr. J. A. Hodges. March 7, opening of an Exhibition of photographs arranged by the National Photographic Record and Survey Association, with an address by Sir Benjamin Stone, M.P. March 13, Ordinary Meeting, "The Illumination of Developing Rooms," by Mr. Howard Farmer. March 20, a demonstration of the Heliogravure Process, by Mr. Ignatz Herbst. March 27, "Some Developers Compared," by Mr. Alfred Watkins.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 22.—Mr. J. E. Hodd in the chair.

MR. R. BECKETT said he had been trying the solutions recommended by Mr. W. B. Ferguson for copper toning, and found that there was much to be done in this way. Very pleasing tones could be obtained on bromide prints, their character could be altered to a considerable degree, and the process was of the simplest description. At a certain stage there seemed to be a brightening of the print, or intensification, and a half-minute's treatment gave a very nice brown-black. Such an example was shown, also one in which the toning had been carried yet further. In this there appeared to be a kind of selective action. In the deep shadows little change was wrought, while in the lighter tints there was a reddening action. This was probably due to the condition of the gelatine in the print. The dark portions seemed to be able to resist the solutions. This was seen in two or three of the subsequent examples until the whole image became wholly red. Carried beyond such a stage, Mr. Beckett did not think any further action would result. There was no staining of the gelatine if one were careful in the proportions. Too little citrate in the bath caused staining; if increased, there was little chance of stains appearing, and the action was slowed, which was preferable to quick action.

MR. A. HADDON experimented in the direction of copper toning some seven years ago, but not in the same way as Mr. Ferguson had. As far as he could judge, they were still as good as when produced although he believed one or two had assumed a kind of iridescence.

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Some discussion centered on the suggested influence of the developer used in the first place for making the prints. Different reducing agents had different degrees of tanning action upon the gelatine. Some of the prints were done with anidol, some with metol, hydroquinone, &c.

Mr. J. S. TEAPE suggested that copper had no advantage over uranium, with which all the tones shown could be obtained.

Mr. BECKETT believed copper gave a more permanent print. In the case of uranium one had also to be particularly careful to keep the print away from an alkali, which would soon ruin the tone. The price was also to the advantage of copper.

Mr. WALTER D. WELFORD showed some film negatives in which were some tear-like marks, not unlike development marks. They were not development marks, but were caused, he found, during the time the films were left soaking between fixing and washing.

Mr. HADDON considered that air bells were probably formed in immersing the fixed films in the soaking bath, and the hypo remaining in the film in contact with the air would, as was to be expected, reduce the image at that spot.

This explanation was generally accepted.

Mr. BECKETT remarked that, in different conditions, hypo baths had very different effects. A very old and much-used fixing bath will actually intensify a plate.

Mr. HADDON remarked that one approached very near to Wellington's intensifier in this case—a developer *plus* silver dissolved in hypo, and an old fixing bath was charged with silver.

Mr. FRESHWATER brought up the question of copyright and the new Bill which will shortly be laid before the House. At the Society of Arts Mr. Bale had read a paper upon the subject, and, from the report of the discussion, it seemed that there was an intention to convey an impression that photographers were not opposing the Bill, which aimed at depriving them of privileges so long enjoyed, and placing photography in a position of far less security than that now proposed for painting and the allied arts. He thought that this impression should be speedily contradicted, as photographers were strongly opposed to the Bill, and had entered a strong appeal against it.

PHOTOGRAPHIC CLUB.

FEBRUARY 21.—Mr. E. A. Newell in the chair.

Mr. Walter D. Welford and Mr. W. F. Slater, the organizers of the Belgian photographic excursion which took place last summer, had arranged an exhibition of the prize prints and slides which resulted from the trip. Mr. SLATER believed that the work shown, which was by beginners and old workers both, would finally dispose of an idea, which had gained considerable currency, that no serious work could be done by such excursions as these. Members of the party had offered prizes of medals for the work done in Belgium—two for slides, two for prints, and one for hand-camera work. Mr. A. Horsley Hinton had awarded the medals as follows: Silver medal for the best print to Mr. T. Lee Syms; bronze medal to Mr. Simmons, of Reading. For lantern slides, the first medal to Mr. Rogers, of Croydon, and the bronze to Mr. Dunning, of Usk. The medal for hand-camera work went to Mr. Rogers also. The slides shown were not those which are travelling the country, but were selected from those sent in for competition.

Mr. ZAEHNSDORF announced the formation of the Deal and Walmer Camera Club, and said that members of this Club would be welcomed there. The Secretary was Mr. White, of High-street.

Samples of Scholz's Siennatype printing-out paper were passed round.

Goldsmiths' Institute Camera Club.—February 22.—Mr. F. O. BYNOE lectured in the Central Hall of the Institute on

THE CAMERA—AN AMUSING AND INSTRUCTIVE COMPANION.

Mr. J. S. Redmayne, B.A., took the chair, and Messrs. A. W. Green and J. W. Barlow were in charge of the lantern. In the course of his lecture Mr. Bynoe lucidly explained the working of hand cameras and the first principles of photography, illustrating his remarks with diagrams and mechanical slides. Some fine examples of the slide-maker's art, depicting hand-camera work in all parts of the world were thrown on the screen, and, thanks to the courtesy of the editor of the *King*, Mr. Bynoe was enabled to include in the series a number of the very latest Transvaal war pictures. It is needless to add that the latter especially were received with loud and continuous applause. The meeting was in every sense a brilliant success, an audience of upwards of 1600 people, from all parts of the metropolis, listening with rapt attention to the lecturer from start to finish. In point of numbers, last year's record was handsomely beaten.

North Middlesex Photographic Society.—February 19, Mr. Rawkins in the chair.—Mr. H. W. BENNETT, F.R.P.S., lectured on

EXPOSURE.

He commenced by saying that neither exposure nor development should be mechanical, but the procedure should depend upon what the subject was and what result was wanted. The least exposure that would give well-marked details in the shadows should be ascertained, and modifications should be based on that. He showed tables of the light for all times of the year, and the exposures required for different classes of subjects, from clouds to dark interiors, all based on personal experience. They showed variations from 1 to 40,000, and were all to be met with in ordinary work. He never met a photographer who could estimate exposure correctly by viewing the image upon the ground glass, and he considered meters, depending upon the darkening of sensitive paper, to be unsuitable, as in bad light the sensitiveness of the paper was much less in proportion to a dry plate. There were five things to take into consideration when making an exposure—subject, plate, lens aperture, time, and weather. If a rule was made always to calculate the exposure for one stop, say, *f*-16, and one plate, calling that stop 1, then it would be easy to calculate for any other; *f*-22 would be 2, *f*-32, 4, &c. The subject and time (of day and year) could be found from tables, easily carried in the pocket. As to the weather, taking a bright day, with light white clouds about as the best light, then a cloudless day would require double when the

sun was obscured three times, and, on days when five times the normal would be required, not many people would be photographing. With regard to the plate, it was better to keep to one kind of medium rapidity, as constant changing from one speed to another upsets calculation considerably. The exposure required was obtained by multiplying the subject, stop, time, plate, and weather as found in the tables, the product being the exposure in seconds. It should be said that in the tables all figures were calculated for *f*-16 for one plate, the weather being the best possible. He gave the approximate relative speeds of a few well-known plates: Castle, 1; Ilford, $\frac{1}{2}$, requiring 1 to 3 times Paget XXX, 1; Edwards's medium isochromatic, $\frac{1}{2}$; Imperial ordinary, $\frac{1}{2}$. A close of the lecture Mr. Bennett kindly offered to supply any member with any or all of the tables should they wish to obtain them.

Liverpool Amateur Photographic Association.—At the last monthly meeting Mr. WILLIAM HARVEY gave a lecture on

ENGLISH CATHEDRALS.

The chair was occupied by Mr. J. H. Welch (President). Mr. HARVEY, in his lecture, which was illustrated by about 150 lantern slides, the majority taken when on a cycling tour, visited York, Beverley, Lincoln, Peterborough, Ely, London, Windsor Castle (St. George's Chapel), Winchester, Salisbury, Wells, Gloucester, Worcester, Lichfield, and Chester, dwelling on the various beauties of the structures, and tracing the development of ecclesiastical architecture in England, showing examples of different periods. The slides were of excellent quality, and reflected credit on the lecturer.

Redhill and District Camera Club.—February 23.—Mr. T. PERCIVALE PADWICK gave a demonstration on

PRINTING IN CLOUDS.

In the course of his introductory remarks Mr. Padwick said that he thought all interested in landscape photography would agree that most pictures were greatly enhanced by the introduction of suitable clouds. As it was not always possible to get the clouds on the same negative as the landscape, "printing in" had to be resorted to in order to obtain the desired result. Mr. Padwick then, with the aid of an enlarging lantern, gave a very clear and able demonstration of the manipulation of the cloud and landscape negative in obtaining a composite print. During the evening, Mr. William Brooks exhibited some lantern slides, to show the high quality and utility of the new optical lantern which the Club has just acquired. It is only necessary to say that the lantern was specially selected for the Club by Mr. Brooks and that it is the very best that could be purchased for the amount placed at his disposal. The Club is to be heartily congratulated on the acquisition of such a useful piece of apparatus.

Southsea Amateur Photographic Society.—The Annual Dinner of this Society was held on Wednesday, the 14th instant, at the Central Hotel, Portsmouth, when about thirty members and friends assembled. The President of the Society, Mr. H. T. Lilley, M.A., presided, and the vice-chair was occupied by Dr. Newby. After the toast of the Queen had been duly honoured, Colonel BRUNO proposed the Southsea Amateur Photographic Society. As a member of some nine years' standing, he could speak with authority as to the usefulness of the Society, and additional evidence was afforded by the fact that new members were joining, and, having joined, were regular in their attendance at the meetings, thus testifying to the advantages to be secured by membership. Only one thing was necessary to complete the happiness of the members, and that was that the fair sex should be admitted to share their privileges, and he hoped that a scheme which was being prepared to form a lady's section would be adopted, to the great gratification of the unmarried members, at any rate. Mr. LILLEY, in a humorous speech, responded. He said that only once in the history of the Society had the present membership been exceeded, and the Society had never before been so active or so healthy. They had some old members, such as Colonel Bruno and others, who represented the old "pyro" days, and also he was glad to note several young members who represented all kinds of things. In fact, the Society was in the position of the photographer who, knowing nothing of the plate he was about to develop, put into his developer every chemical he could think of at all likely to be of use, and trusted to fortune that some of them would have the effect of producing a good negative. No formula was of any service unless it contained a good accelerator, and this part was played with conspicuous success by the Hon. Secretary Mr. T. J. Mortimer, to whose energy the success of the Society was largely due. He would ask Dr. Lord to say what he (Mr. Lilley) had not said. Dr. LORD said that it had fallen to him to perform a very pleasant task. It was not necessary for him to say much about Mr. Mortimer, whose good qualities were well known to all the members. The success of the recent Exhibition was almost entirely due to the efforts of the Hon. Secretary, and at the annual meeting it had been unanimously decided to devote some portion of the surplus funds of the Society to the purchase of some photographic apparatus to be presented to Mr. Mortimer. It was now his duty, and a very agreeable one, to ask Mr. Mortimer to accept from the Society a whole-plate camera as some slight recognition of his services to the Society during the two and a half years that he had held the office of Secretary. Mr. MORTIMER briefly replied, expressing his thanks for the handsome present. Dr. NEWBY proposed the health of the visitors and Mr. BARRELL responded. During the evening songs were contributed by Messrs. Chase, Burvis, Summers, and Wood, and Messrs. Denham, Warren, and Mortimer performed selections on the banjo.

Blairgowrie and District Photographic Association.—February 20, Annual General Meeting.—Very satisfactory reports were submitted by the Secretary and the Treasurer. A vote of thanks was awarded to Mr. H. Snowden Ward for his kindly assistance as Judge during the session. It was decided to purchase an enlarging lantern for the use of members. Office-bearers for the session were elected as follows:—*President*: Mr. Alexander Geekie.—*Vice-Presidents*: Messrs. John B. MacLachlan and Thomas C. Gorrie.—*Executive*: Messrs. James Richardson, D. G. Monair, William Falconer, J. D. Petrie, and A. Mitchell.—*Treasurer*: Mr. John Cameron.—*Secretary*: Mr. Hugh B. Jamieson, The Photographic Club-rooms, Blairgowrie. The question of holding an open exhibition next spring was remitted to the Executive.

March 2 1900]

FORTHCOMING EXHIBITIONS.

1900.
 March 2, 3 Birmingham Photographic Society. Lewis Lloyd,
 The Hollies, Church-road, Moseley.
 , 3-10 South London Photographic Society. Hon.
 Secretary, Frank Goddard, Woodlands, Van-
 brugh Hill, Blackheath, S.E.
 , 13, 14 G.E.R. Mechanics Institution (Photographic Sec-
 tion). C. W. Harris, 294, Cam Hall-road,
 Leytonstone, E.
 , 26 Twentieth Century International, Birmingham.
 Walter D. Welford, 19, Southampton-buildings,
 Chancery-lane, London, W.C.
 , 26-31 Photographic Society of Ireland. W. F. Cooper,
 35, Dawson-street, Dublin.
 April 3-7 Birkenhead International. C. F. Inston, 25, South
 John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those which the Exhibitions open.

Patent News.

- THE following applications for Patents were made between February 12 and February 17, 1900:—
- SHUTTER REGULATORS.—No. 2764. "A New Method in the Making of Pneumatic Regulators for Photographic Shutters." F. J. CHRISTMAS and W. WATSON.
- ROLL FILMS.—No. 2770. "An Improvement in Photographic Roll Films." Communicated by the Actien-Gesellschaft für Arolin Fabrikation, Germany. Complete specification. C. D. ABEL.
- AMERAS.—No. 2859. "Improvements in Photographic Cameras." Complete specification. C. P. DIXON.
- HALF-TONE ENGRAVING.—No. 2942. "Diaphragm System for the Half-tone Photo-engraving Process." A. W. PENROSE and W. GAMBLE.
- AMERAS AND STANDS.—No. 3017. "Improvements in Photographic Cameras and Stands." S. F. DUFTON.
- EXPOSURE REGISTER.—No. 3090. "A New or Improved Exposure Register for Attaching to Automatic Spring Fasteners for Shutters of Dark Slides." A. MAURICE.
- DEVELOPING TRAYS.—No. 3183. "Improvements in Photographic Developing Trays." J. E. BARNARD.
- SHUTTERS.—No. 3198. "Improvements in or connected with Shutters for Photographic Cameras." E. H. HAMILTON.
- film BACKINGS.—No. 3214. "Improvements in Backings or Wrappings for Photographic and Similar Sensitive Films or the like." J. B. B. WELLINGTON and H. H. WARD.

Correspondence.

* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
 * We do not undertake responsibility for the opinions expressed by our correspondents.

COLOUR PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—In March last I wrote to you protesting against some remarks made by you in your articles on "Colour Fallacies." In looking over old photographs and lantern slides lately, I found a few lantern slides and papers which bear out, I consider, my remarks, and which, as well as I remember at so great a distance of time (1889), give a very fair representation of the tints as they were. They are now about twelve years old, have been lying away in a corner, and consequently not much exposed to light. They have only undergone the usual processes of fixing, toning, developing, &c.

I should like to submit them to you to look at and give an opinion; but, as they are of value to me as a record (though, perhaps, to no one else), I should require an engagement that they would not be tampered with, or experiments tried upon them, and that they should be returned uninjured. Will you let me know whether you agree to this? I would send three lantern slides.—I am, yours, &c., R. O'HARA, Lieut.-Col.

Galway, February 20, 1900.

[We shall be very pleased indeed to have the opportunity of inspecting Colonel O'Hara's lantern slides; and, of course, will return them in the same condition in which they reach us. Our opinion of their colour characteristics shall be stated with the utmost frankness.—Ed.]

THE CAMERA IN THE CAMP.

To the Editors.

GENTLEMEN,—I have no intention of entering into a discussion with Mr. Maclean. It would be useless to attempt to convince those who con-

sider ignorance of anything but one side of a question a qualification for dogmatizing. It is probable that photography will find larger opportunities in war, but I venture to think it will not be exactly on the lines urged by Mr. Maclean; and the best thing to be done to bring about the desired result would be to work out a scheme *thoroughly*, and be prepared to bring it forward when the pressure is over and it can be tested by those who have practically learnt what is wanted by our present arrangements.

I need say little to you as to the charge of belittling photography; such should have been prevented by the latter part of my letter (not the last paragraph, which was not meant for publication); if photography has its uses, it has also its limits of usefulness, and one whose experience is rather wider than ten years of superintendence of lantern shows will, I hope, be considered better qualified to form an opinion than Mr. Maclean.—I am, yours, &c., J. F. T.

To the Editors.

GENTLEMEN,—Whether the enclosed cutting, from the *Daily Mail* of February 22 is indicative that the War Office is acting upon the suggestions contained in my article in *THE BRITISH JOURNAL OF PHOTOGRAPHY* of February 9, is a matter of conjecture. Any how, it amply justifies the views that I advocated.—I am, yours, &c., HECTOR MACLEAN.

Croydon, February 24, 1900.

SNAP-SHOOTING THE BOERS.
CAMERA TO PLAY ITS PART IN THE WAR.

(Daily Mail Special.)

Everything is in readiness for the dispatch to the front by the War Office of a small but perfectly equipped party of tele-photographers, whose particular duty it will be to furnish pictures of important positions to the general commanding, or for the subsequent information of the Intelligence Department.

Those who will form the contingent are Corporal Thornton and Sappers Richardson, Dee, and Bullock, of the Royal Engineers, who will take the photographs, the development of which will be the duty of a printing party, composed of Corporal Bright and Sappers Hallett and McEwen.

The photographic outfit is compact, and is, of course, specially adapted for use in the field. It will consist of one large tele-photographic camera, capable of taking anything within a range of three miles, a smaller camera, and a number of pocket snap-shooters for close work.

The printing wagon will be fitted with all the necessities, including a dark room and a gallery for the collection.

Daily Mail, February 22, 1900.

ORTOL IN INDIA.

To the Editors.

GENTLEMEN,—The praises showered on this new developer caused me to try it, so I bought, and am still using, my first bottle; probably it is also my last. As I was going to mix my first brew of developer, my friend, Charley Pritchard, alias the Butcher, came in with his dog. As I lifted the virgin cork the terrier began to display curiosity, and his master said, "Hollca, something dead; 'ere, Boxer, find it!" "No, you've put your foot in it this time," says I, not looking at him. "Nothing of the sort," says he, looking at his boots, "'ere, Boxer, good dawg." Having weighed out the proper quantity of the slate-coloured sooty-grey powder, I put it into the water and followed up with the other ingredients in order. The smell disappeared in time, as did Charles P., but the solution was not satisfactory. A blackish scum floated on top, and a brown cake formed at the bottom, and required continual crushing. Gas was being generated, and bits of the porous mass insisted on floating at the top. Each had to be driven to the side and carefully crushed; then, after considerable stirring and about half an hour's work, everything was dissolved; but where was the deep red solution I had expected? This was dirty brownish, and soon began to deposit a blackish powder. Never mind, all gold does not glitter. The first time of using (8 ounces for about twelve quarter-plates), the negatives were excellent, bright, dense, and quickly done. The next day, having kept the developer to see if it would develop the desired ruby tint, I tried a couple more plates, but they took ages to come up, and were thin and flat, and useless. There was by this time a considerable black precipitate in the graduate.

Mr. Watkins says, in the ALMANAC, that no developer can produce fog. I got real high-class fog on quickly developed films, using hypo as recommended in the developer. Without hypo the same films, and same treatment, produce clear negatives, at least as clear as one expects isochromatics to be when not developed in darkness. No forcing at all. The only advantage I have found in ortol, so far, is that it gives you a quinol negative in metol time, if you wish it and use fresh solution. The continuing action is remarkable, but less so than that of ammonium persulphate, which removed the whole image from a film of mine, even after a dip in hypo, and I thinking it was only getting itself washed! If my bottle of ortol was good, metol is better. If it was bad, it will not keep good, and so won't do for me. I tried putting in the ortol last, but no difference.—I am, yours, &c.,

TIPPOO—1872.

APATHY OF BRITISH HAND-CAMERA MANUFACTURERS.
To the Editors.

GENTLEMEN,—British makers of cameras must have their hands more than full, to judge by my recent experience. In the beginning of the

year, and since, I wrote twice to two of the most prominent manufacturers of reflector cameras, making a suggestion. The suggestion took the form of a query, and was to the effect, if it were not feasible for a reflector camera with reversing frame and full-sized pictures, vertical and horizontal, for daylight roll-holders and double backs, to be made, which, in its box form, would serve as a short focus hand-camera, but, that by adapting the hinged falling front as a platform, on which the lens front could be racked out, it could be used as a stand camera with greater focal lengths? In the latter case, the swing mirror focussing arrangement would still hold good, and, if the combined movement of it and the shutter were no longer practicable, these two could be then disconnected and reconnected when necessary. An ordinary focussing screen, as well, would be desirable.

The only difficult part of the problem would seem to be the devising of a sufficiently compact bellows extension to permit of a square picture being taken with a relatively short-focus lens, say for 5×4 with $5\frac{1}{2}$ in. Satz lens, extending to 12 or 13 ins.

A well-made camera of that type, with shutter and reversing frame, but without lens or roll-holder, ought not to cost much more than 4*l.* or 5*l.*, and would be pretty certain to find many buyers. Failing to get a reply from British firms, I have now written to some Continental manufacturers, who seem to go in extensively for this form of camera.—I am, yours, &c.,

A. G. B.
February 21, 1900.

[Our correspondent, who writes from abroad, adds: "I am making the inquiry not only on my own behalf, but also for others here. I should have willingly given the preference to English makers, but, failing them, shall have to give the order to foreign or U.S.A. manufacturers."—EDS.]

DAYLIGHT CARTRIDGES.

To the Editors.

GENTLEMEN,—My attention has been drawn to your article of February 16, on "A new form of Daylight Cartridge." It will interest you to know that for some time past I have been making such a cartridge with our Cristoid film, the subject of a patent by Mr. W. F. Stanley.—I am, yours, &c., J. T. SANDELL, Manager, Sandell Films & Plates, Ltd. Norwood Junction, London, S.E., February 26, 1900.

Answers to Correspondents.

* * * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:

C. E. Weale, Victoria-road, Tamworth, Staffordshire.—Photograph of group of Tamworth Volunteers.

F. PATTERSON.—The Platinotype Company, Bloomsbury-street, London, W.C.; The Britannia Works Company, Ilford, E.

GELATINE RELIEFS.—W. BIGGS. As you do not get a sufficiently high relief, you are probably using an unsuitable gelatine for the work. See article on the subject last week.

J. D.—A nice point. Of course you could "safely" do so, but we do not think you would be quite justified in using the older name. Better employ the same name as the makers of the paper, and you can hardly do wrong.

CLARKSON & WILSON.—We are sorry we cannot be of assistance in the matter. The formula was published with the authority of Professor Valenta, of whom we will endeavour to obtain some explanation of the reason of its failure. We do not answer questions through the post.

BOOKS ON FINISHING.—G. M. B. says: "Will you oblige by telling me what you consider the most helpful books for teaching finishing in black-and-white?"—In reply: There are some chapters on the subject in *Retouching*, by R. Johnson, published by Messrs. Marion & Co., Soho-square, which might help our correspondent.

E. LIPPINCOTT (Portishead).—We have never heard of the individual named, but you may be quite sure that there is not in London a society whose object is to secure photographic records of interesting portions of England which employs a travelling photographer of the kind. We do not answer questions through the post.

BURNISHING.—BURNISHER writes: "Kindly let us know how to use a bar burnisher, and which would be the best lubricant for same?"—Simply make the bar thoroughly hot, and, having the right pressure applied, pass the prints through. Lubricate the prints with a solution of Castile soap—say, twenty to thirty grains to the pint of spirit of wine—methylated spirit will do.

IMPURE TAP WATER.—F. A. says: "Recently, when washing P.O.P. before toning, I have been troubled with small brown specks appearing on the prints, and when toned turn black. I have tried all ways of filtering and used boiled water and different makes of paper, but of no avail. How can they be avoided?"—In reply: From the appearance of the spots we should conclude that the water contained traces of iron or some other metallic compound.

SHUTTER.—R. CROSWAY complains that the shutter he has on his hand camera is not fast enough for his work, the highest speed being one-ninetieth of a second, and asks how he can make it work faster.—The highest speed the shutter he mentions is made to work at is that named. The same makers, however, supply others that work at a higher speed, one of which we should advise him to get. Possibly a focal-plane shutter would answer his requirements best.

LIGHT-STRUCK PLATES.—A. THOMPSON says: "I put a dozen plates that had been exposed in a grooved plate box and unfortunately left the lid open in the dark room, and its door was open for some hours. Of course, the plates are fogged, but the subjects are of great interest and cannot be taken again. Is there any possible means of counteracting this fog so that the image can be developed without it?"—No. Nothing can be done. The plates are completely spoilt.

DAMAGED GLASS POSITIVE.—C. C. says: "I have a very old glass positive, highly prized by its owner, to copy and make an enlargement from. The black varnish on the back is cracked all over. A photographic friend recommended me to rub the varnish over with lampblack to fill up the cracks, and it does so, but still they show badly. Can you advise anything better?"—Yes. Scrape off the old varnish altogether and apply fresh. Did not this occur to you?

S. LINDEN (Davos).—1. We have had knowledge of the camera named since its introduction five years ago, and we think you may safely take your friend's recommendation. We should regard the instrument as suitable for the classes of work named. 2. Optically, there is perhaps nothing to choose between the two lenses named, but the second gives you the greater variety of foci, and, possibly, should have the preference on that account. We do not answer questions through the post.

SCRATCHED LENS.—J. KOHLER says: "I am offered at a low price a R.R. lens by —, but it has a scratch on the front glass. Can you say if it will make much difference in its working if used as it is? also what would be the probable cost of getting the scratch removed by the maker of the lens?"—The scratch will make no practical difference in the working of the instrument. We cannot say the cost of removing it. Better consult the maker of the lens on this point if you wish it removed.

ANILINE DYES ON P.O.P.—NOVICE writes: "I wish to colour some photographs on P.O.P. of my own taking, and find it most difficult to do with water colours. In my business I make use of aniline dyes, and it has occurred to me to use them for the purpose with rather good effect. Can you tell me if there is any chemical in the photograph that will affect the dyes?"—Supposing that all the hyposulphites have been removed from the prints, there will be nothing that will affect the dyes usually employed for tinting photographs.

LEAKY ROOF.—R. W. writes: "I have just taken a studio, and the water comes through the roof as through a riddle. Can you tell me the best way to get the roof repaired?"—If the studio is an old one, probably the putty securing the glass is perished, in which case the best way will be to have it scraped away and fresh applied. When the old putty has been removed, it will be a good plan to give a coat of paint before the new putty is put in. The present is not a good time for the work. It had better be deferred till a little later on.

ILLUSTRATING CATALOGUE.—A. & Co. write: "We have to illustrate a catalogue of property for sale with 10×8 views of it. There will be about seven or eight pictures, and the edition will be about 250 only. They must be photographs, but not silver prints, and carbon and platinotype will come too costly. We suggested process blocks, but they are refused. What can you kindly suggest for the purpose?"—The most suitable process we can suggest is collotype. It is specially adapted for that class of work, as the pictures can be printed with a margin, so that no mounting is required.

MOUNTANT.—MOUNTANT writes: "I have a large number of chocolate mounts, on which, when a photograph is mounted the colour dissolves and shows through print in bad blotches and streaks. Can you tell me of any mountant that could be used which would form a coating between the print and mount? would a gelatine mountant do, if so, would you give your receipt for making? I always use fresh starch."—There are many chocolate mounts now in the market which have this defect. We would suggest that the mounts be coated with a thin solution of gelatine and allowed to dry. Then, we surmise, if the prints be mounted upon them with starch in the usual way, the colour will not show through.

APPRENTICESHIP.—FATHER writes: "I apprenticed my daughter for three years to learn the photographic business. The first year to receive no wages, the second year two and sixpence a week, and the third year five shillings per week. She was to learn reception-room duties, retouching, printing, toning, &c. She has been at it now for over two years, and has been kept entirely at mounting and spotting, and occasionally, when the light is good, assisting in watching the printing frame. She has done nothing at toning, sensitising, retouching, or attending in the reception-room, and knows nothing about it. Have I any remedy? I only paid a small premium with her."—Yes. If the photographer does not teach the apprentice according to the indentures, the law will give you redress. Better consult your solicitor. Yours is not at all an exceptional case. Many unscrupulous photographers take apprentices more for the purpose of getting cheap labour than teaching them their business, though the practice is very disreputable.

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EX CATHEDRA.

LAST week the many claims on our space compelled us to leave out the principal part of the discussion which followed the reading of Mr. Edwin Bale's paper on "Artistic Copyright," at the Society of Arts, on Wednesday, February 21. We print the missing matter this week, and it will be seen that it contains several points of debate, which were overlooked by the opponents of the Bill at the meeting. The remarks of Mr. Alfred East, A.R.A., in particular, are extremely likely to create a false impression, which it is desirable to remove at the earliest moment. The attitude of photographers towards the Bill is not, as Mr. East appears to think, one of complaint that they had not been considered in the preparation of the St. John's Wood Art Club's precious measure, but rather that they are the victims of too much consideration. "Leave us where the Act of 1862 placed us," say the photographers. This is all that the meeting convened by the Royal Photographic Society last June asked for; it is all that the Copyright Union demands. Mr. Frank Bishop made this fact abundantly clear in the speech to which Mr. East replied. The latter gentleman's reason for abbreviating the term of photographic

copyright seems to be that the British photographer is better treated in the matter than his French *confrère*—a very desperate and far-fetched way of apologising for the uncalled-for interference in the rights of native photographers by a group of St. John's Wood artists.

* * *

WE cannot agree with Mr. East and subsequent speakers that, in the preparation of a Bill affecting thousands of professional men, not one of the latter was consulted in the matter, is the very minor point it is said to be. The ignorance of photography and the position it has won for itself, which the promoters of the Bill display in every utterance they make on the subject, renders it lamentably plain that they have undertaken to legislate for a class whom they misunderstand as well as dislike. Photographers do not desire the sympathy of Mr. East and "every artist." They are perfectly willing to exchange this needless patronage for the non-interference of the Royal Academy and Messrs. Cassell & Co. in matters of photographic copyright. Mr. East talks of the "benefits" which the new Bill confers on photographers. It is hard here to take Mr. East seriously, but we suppose we must. If, therefore, the heavy tax of compulsory registration, a diminished term of copyright, an unworkable set of relations between photographer and sitter, and other absurd and unnecessary provisions, are what the St. John's Wood *coterie* considers beneficial to photographers, we must humbly say that photographers would very much rather forego such unpleasant kindnesses. Or was Mr. East only betrayed into a piece of unconscious cynicism when he used the word "benefits?"

* * *

WE have not quite finished with Mr. East. He says that many inquiries were made of eminent photographers, and he understood they were satisfied with the time suggested in the Bill. We should like to know the names of those eminent photographers. Most photographers of eminence are supporters of the Royal Photographic Society and the Copyright Union, of the existence of which Mr. East could hardly be ignorant. We are astonished that he contented himself with questioning a few individuals, and did not refer the Bill to a representative body; but all through the piece the promoters of the Bill have

shown the most marvellous ingenuity in concealing that sinister production from the observation of the dreadful photographer. It is all apparently part of the generous scheme to "make him sit up." Mr. East further tells us that photography was introduced into this Bill as an afterthought. Quite so; when the painters and others had made up their minds what to ask Parliament to give them in the way of increased copyright protection, the opportunity of also praying the legislature to save the older forms of graphic expression from a persistently progressive young enemy, photography, was not to be neglected.

* * *

So much for Mr. East, who, however, is known to have a more sympathetic and intelligently appreciative feeling towards photography than many of his *confrères* and some of the contributors to the Society of Arts discussion. Of the latter, Mr. Walter Field particularly distinguished himself in the endeavour to prove his admiration and knowledge of photography. He said that artists objected to a machine view of nature. We ourselves know nothing more objectionable, except an indifferent painting. In Mr. Field's opinion, "if a number of photographers took a scene, they all did the same thing; but a hundred artists, set opposite the same subject, would make a hundred distinct pictures. Art was quite distinct from photography." But Mr. Field amply atoned for all this antiquated fustian by saying that he did not know why photography came into the Bill at all. Precisely; and Mr. Field may be assured that photographers are only too anxious to be left out of the Bill. A subsequent speaker did not think a snap-shot ought to be classed in the same category as a picture. And yet Parliament is asked to make compulsory registration applicable to the former and not to the latter! Consistency is evidently not a strong point with the supporters of the Bill, who would belittle photography and penalise it at the same time.

* * *

THE Act of 1862 classes photography with the fine arts; the St. John's Wood Bill proposes to place it in the same category as plaster-cast making. Objection to this needless interference with a classification that has stood for thirty-eight years is met by Mr. Bale and his friends with the rejoinder that it is all a matter of sentiment which does not allow of argument. Photographers, as a body, would probably trouble themselves very little over this point if an alteration of classification were unaccompanied by those penalising, spoliative, and confusing clauses of the Bill to which exception has so often been taken. The nominal degradation complained of is followed by the infliction of substantial pecuniary damages, so that the protests which have been made are based on a more solid foundation than that of sentiment. Of all persons to-day, photographers are the least concerned to prove that photography is a "fine art"—the old controversy over the point no longer interests them; but they have a right to insist that, as thirty-eight years ago it was so defined by the legislature, for purposes of copyright protection, the classification should not now be disturbed, unless it can be shown that the legislature had originally erred, or was misled in the matter. Besides, a little acquaintance with the subject (which Mr. Bale and his *protégés* clearly have not taken the trouble to acquire) would reveal the fact that, pictorially regarded, photography stands to-day in an immeasurably higher position than it did thirty-eight years ago, and that whatever claims it then possessed to be regarded as a fine art have been immensely strengthened in the

intervening time. But Mr. Bale, R.I., knows nothing of these things. He defines photography as "science," and complains that "some (*sic*) photographers thought the Bill was an attack upon them." Could anything be more delightfully artless. An attack that Bill certainly is, and we should not be doing our duty to the photographic profession if we did not insist upon the fact at every possible opportunity.

PLATE-BACKING AND SENSITIVENESS.

WE consider that we may take some credit to ourselves for having brought home to photographers the usefulness of backing plates to reduce halation. In season and out of season, persistently and consistently, have we urged the desirability of backing all plates where a possibility of halation existed; for a long time our advice fell upon deaf ears, while now there are few workers who do not admit the need for its use, or, indeed, who do not make use of it at times. It will be observed that we write of reducing, not curing, halation; no backing in the world will at all times prevent its appearance, though it may be in a modified degree. Yet plate-backing is no new invention, there were backed dry plates upon the market as far back almost as a quarter of a century ago. They were not, of course, gelatino-bromide plates, and they were not so efficiently backed as the more recent methods are capable of effecting. Plates backed by placing some dark paper in optical contact were in use in wet-plate work, yet the dry plates we refer to had a red pigment, but only in imperfect contact. The glutinous or gummy environment of the particles of pigment was mainly for the purpose of ensuring adhesion to the plate and preventing the pigment from rubbing off.

Modern theory points out that a medium possessing an index of refraction differing little from that of the glass plate is advisable to use with pigments, or as a constituent of or a diluent for transparent backings, such as caramel. Our own preference used to be given to a pigment held in glycerine and gum solution, and such a mixture cannot be excelled as far as the immediate purpose is concerned. It possesses, however, one very grave drawback in practice. Even with a mixture with ingredients exactly proportioned to avoid tackiness on the one hand or difficultly soluble hardness on the other, loss of time is involved in getting rid of the backing. It may be said that this backing may get rid of itself, that is, gradually come away in the operation of developing and fixing, and that would be quite true; but the pigment, if, as should be the case, a finely ground one, will meanwhile gradually attach itself to the film, and require extreme care to ensure its entire removal, and it will foul the fixing solution and cause it to stain all the plates afterwards fixed. The plate would need to be well rubbed with the palm of the hand or with cotton-wool, and well swilled with water. The best plan by far is to entirely remove the backing with a wet sponge or otherwise before beginning development. With caramel and that type of substance no such care is needed. Perhaps the typically perfect mode of backing is that employed by one firm, who attach a piece of black paper by a suitable medium of so very soluble a nature that the paper may be peeled off the back a few seconds after being wetted, and this though the plate may be several years old, as we can testify from personal experience.

In deciding on the merits of a plate as to comparative freedom from halation, it should always be remembered that, if the test object be a well-lighted window, forming part of an

interior view, it must not be imputed to the plate as a fault if a haze or glare surrounds the window, fogging, as it were, the dark parts immediately near to the glass, and making the mullions pale instead of almost black. This well-known effect is not true halation, it is an actual objective phenomenon, and due to the illumination of the atmosphere lying almost in a line with lens and window. This is capable of visual proof by interposing an opaque screen between the eye and the window, the atmosphere haze becomes distinctly visible.

A little while ago a discussion took place as to whether the use of backing did not slow a plate, some of the speakers taking the position that such slowing did take place. No satisfactory termination of the discussion being arrived at, and our own practice not having led to any such conclusion, we determined to put the matter to the test of a simple experiment. Cutting a half-plate into two, we backed one half of one piece, and exposed the backed portion under a Warnerke sensitometer to the light of a naked gas flame, burning at a constant pressure, for exactly one minute. We then immediately exposed the unbacked half in an exactly similar manner, and for the same length of time; after developing in a normal pyro-soda solution for four minutes at a temperature of 60° F., we closely scrutinised the results. They were absolutely identical as regards the sensitiveness. We repeated the experiment with the same result. We then reduced the intensity of the illumination. Duplicate experiments confirmed the conclusions from the first results. Finally, to assimilate the conditions to a dimly lighted interior, we still further reduced the illumination and gave twenty seconds' exposure; still there was not a particle of difference observable between the backed and the unbacked half.

We think these experiments, simple as they are, conclusively prove that the diminution of sensitiveness through backing the plate is a mere figment. In conclusion, we would remark that we incidentally noted that the Warnerke sensitometer, besides indicating the sensitiveness of plates, its legitimate function, is a most excellent test of the extent of the resistance or otherwise of a plate to halation. Thus the unbacked halves in each of the instances showed the indicating numbers in the thinner part of the sensitometer (1, 2, 3, &c.) thoroughly covered with "fog"—i.e., true halation; but in the backed halves this was reduced to a negligible minimum.

A Useful Thing in the Dark Room and Outdoor Kit.—There is a very handy thing to have in the dark room, or in the pocket when travelling, that seems to be less known amongst photographers than it deserves to be. We allude to what is known as American sticking plaster. Its uses in surgery—for which it is put on the market—is to take the place of the old lead or diachylon plaster of the pharmacopœia. One of its advantages to the photographer is that it does not require warming to cause it to adhere; it is simply pressed on any surface, when it holds on firmly, and is, moreover, waterproof. For temporarily repairing it is most useful. For example, a piece stuck over a crack in an ebonite dish or a glass measure will at once render it serviceable again. A crack in a dark slide or a hole in the camera bellows may at once be stopped by an application of a strip of the plaster.

WE remember being at a meeting of the Photographic Club a year or two ago, when the repacking of dry plates after exposure was under discussion, and one of the members described his method. It was this. The plates, when taken from the slides, were dusted, and then placed, film to film, in parcels of six. Then a strip

of the plaster was pressed across two or three sides of the plates, which were then held fast, practically as a solid block of glass. They were then wrapped up in the black paper they came in, and replaced in the boxes. One advantage of this system is that the films are perfectly secured against atmospheric influences. Diachylon would, of course, answer the same purpose, but it would require the aid of heat to render it adhesive, which is not always available without light. One advantage of the American over the lead plaster is that the coating of resinous matter is more adherent to the fabric upon which it is spread than is diachylon, and consequently it is better suited for resisting water. This plaster is obtainable at most chemists' in rolls, from a quarter of an inch to three inches wide, in sixpenny and shilling boxes. It may also, we believe, be had to order up to a foot or more wide. We have found the material useful in our own hands in so many different ways that we should recommend our readers to make its acquaintance.

War Prisoners and Photography.—We read in a telegram from Orange River that, when the Boer prisoners of war passed through, from the joyful faces of the men, they were on a pleasure trip. Possibly they were, considering their past experiences. The correspondent says, "They crowded round the window as the train steamed through the camp, waving their hands to the troops, and evidently anxious to get into the pictures which were being taken by the ubiquitous photographer." Evidently from this there are "ubiquitous photographers" in South Africa, as almost everywhere else, but it is a little strange that people should desire to figure in photographs in what might almost be considered humiliating circumstances. However, some people have a strange fancy for figuring in photographs under any circumstances, as most photographers are aware, often to their annoyance, although the people must be fully aware that they will never see the pictures. Almost every photographer who has set up his camera in a country village, for example, has experienced the annoyance of the natives posing in the foreground, and the difficulty he has in getting his pictures without them, and the *ruses* he has to adopt. Evidently the same intrusive idea seems to prevail with the Boers as with our villagers.

Balloon Photography in War once more.—It is announced that Professor Cailletat, of the Institute of France, is carrying out some experiments at Toulon with a war balloon and a camera. We are told that, by placing the camera in the car of a captive balloon and operating on it by electricity from below, photographs can be obtained over an area of country six miles square, every detail of which is so accurately shown, and that in war the photographs would be invaluable, &c. The late Mr. W. B. Woodbury demonstrated the practicability of this, if we mistake not, something like twenty or twenty-five years ago, before the Balloon Society. His method was, if we remember rightly, precisely similar to Professor Cailletat's, namely to operate a camera, attached to a captive balloon, by electricity from *terra firma*, utilising the wire securing it as one of the conductors. Although Mr. Woodbury's idea received but little attention at that time, and there was no immediate occasion for it, it may be utilised in the future. If it is, Woodbury should be accorded the credit.

The Kammatograph.—This instrument, so named after its inventor, Mr. L. Kamm, an electrical engineer, is the latest contribution to the art of cinematography, and is remarkable for the circumstance that it does not employ celluloid or any other kind of film. The pictures to form what is popularly known as an "animated photograph" are taken, to the number of nearly six hundred, upon a circular glass plate coated with gelatine emulsion. This plate which is twelve inches in diameter, fits into the camera, and by turning a handle it is caused to rotate, to make the necessary stop for exposure at every fourteenth of a second and to execute a slow lateral movement, so that the pictures are impressed spirally upon its surface. The negative so taken is developed in a dish in the usual manner, and a positive, upon another circular plate, is printed

by contact. The positive disc, after development, goes into the camera, the whole contrivance is fixed up in front of a lantern body, and the animated picture is projected upon a screen. The Kammatorograph is intended for home use by amateur photographers, and the projected pictures are large enough for such a purpose. The instrument is thoroughly practical in character, and speaks well for the ingenuity of its inventor. The circular plates are supplied by Messrs. Marion, who will, doubtless, be able to afford further particulars concerning this very clever contrivance.

THE NASCENT SILVER THEORY.—A REPLY TO DR. EDER.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

ALTHOUGH I am convinced that no satisfactory result can follow from this discussion unless conclusive experiments be made, I would rather not leave unanswered the article* which Dr. Eder has recently published.

In the first place, I wish to state that Eder does me too much honour in representing me as the principal champion of the nascent silver theory. The theory has been held for a considerable time by various photographic chemists, as Eder has shown in his very complete study of the history of photographic chemistry. The modest experiment which was put forward by me a short time ago† in favour of the nascent silver theory‡ does not merit any such acknowledgment. The only service to which I may lay any claim is that I have awakened from its slumber the fundamental question of the nature of the latent image. If my views upon the question are less certain now than when I first expressed them, this is attributable to the numerous experiments which have followed as the fruit of the animated discussion which has taken place. But I must emphasise the fact that the experiments of the past, without exception, could only be explained by means of the nascent silver theory, and that Eder has never referred to them in opposing it. All the evidence to the contrary has been discovered since my article appeared, and is due to its publication. Until then the assumption of a sub-haloid was quite superfluous.

I would also call to mind the fact that Eder abandoned his important experiment of developing by contact with metallic silver, and attributed it to pressure, as soon as it was used as a proof of the nascent silver theory, with which it harmonised so well. But, as I at once remarked, the experiment supports neither theory. Yet, several experimenters (Abney, Abegg, Herzog, and Luther) have proved beyond doubt the specific action of silver.

I am of opinion that the first exact experiment deciding between the two theories was brought forward by Dr. Luther. He proved, firstly, the existence of silver sub-haloid, which, till then, was absolutely hypothetical. Secondly, he showed that the latent impression formed by light upon a film of silver halogen actually consisted of sub-haloid. But this was only for films devoid of any vehicle, such as gelatine or collodion. On account of its reductive power, the former does not exclude the possibility that the latent action of light is more extensive under such circumstances.

Although the evidence against the nascent silver theory is inconclusive so far as gelatine emulsions are concerned, Luther's experiments have added so much to the probability of the sub-haloid theory that I am unable to decide at present to which I should give my adhesion. This "triumph" of the sub-haloid theory is not, however, due to any of Eder's arguments, as his article would make his readers believe, for his experiments are inconclusive, as I believe I have shown on several occasions.

I must also strenuously protest against Eder's assumption that I have diverted the term "nascent silver theory" to a more promising purpose, in order to cover my "defeat." This assertion of Eder's is based evidently upon my use of the term "nascent silver" to denote the small particles of metallic silver, when writing upon the theory of photographic development. It implies that I then recognised an essential difference between the metallic particles of which I supposed the latent image to be formed, and those constituting the developed image. But, from the outset, it was my desire to emphasise the opposite, and to insist upon the essential similarity of these minute particles—the "nascent silver"—whether produced by development or exposure.

In the paper to which I have referred, where the expression "nascent silver theory" is introduced, the unprejudiced reader will find evidence in every paragraph of this meaning of the expression, "nascent silver."

Consequently, it is Eder who perverts the term "nascent silver" from the implicit meaning I had given it, and concerning which there could not have been any doubt. The right to define assuredly belongs to the originator of the term.

Although, in my opinion, such purely personal explanations are highly unprofitable, I cannot allow this unfounded assertion by Eder to pass. I deeply regret that in the discussion of mere facts relating to both hypotheses a tone of personal animosity should have been introduced. This is contrary to my wishes, and cannot promote scientific knowledge, which alone should be the object of this discussion. DR. R. AEBEGG.

NASCENT SILVER VERSUS SUB-HALOID.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

I MUST confess that I am rather disappointed at the remarks which Professor Abegg has made in reply to my paper. Although the nascent silver theory has received a heavy blow at the hands of Dr. Luther by proof of the existence of silver sub-bromide, no fresh facts are adduced in support of the same. I will confine myself to two points. The possibility of development after fixing might be taken as a proof of the nascent silver theory; but, as it is now found that sub-bromide is reduced to silver by a solution of thiosulphate of soda, the sub-bromide theory is brought into harmony with experience. But there is a possibility that silver bromide forms compounds with gelatine upon exposure to light, and that they are very indifferent to thiosulphate. Sterry has described these as the latent organic image. Sterry also obtained an image with gelatine and nitrate of silver. By physical development silver was deposited where there had been light action.

According to the nascent silver theory, prolonged exposure should reduce the entire particles to silver, but we find that solarisation occurs. Abegg adopts Liesegang's hypothesis that a wall of silver protects the particles from the developer; but, as solarised films can be fixed, it is untenable, for the silver wall should prevent fixation. If we assume that the nascent silver is dissolved by the thiosulphate, it should be impossible to develop the image after fixation, but this is not the case.

G. MERCATOR.

PHOTOGRAPHY AND THE FORTHCOMING ECLIPSE OF THE SUN.

To *Knowledge* for March Mr. E. Walter Maunder, F.R.A.S., contributes an article on the eclipse of the sun, portions of which have a special interest for photographers. According to Mr. Maunder, the numerous methods of observation, photographic or visual, carried out or attempted in past eclipses, will be again tried next May. Photographs of the corona will be taken on all scales, from that giving the sun a diameter of four inches, such as the Astronomer Royal obtained in India with the Thompson heliograph of the Royal Observatory, Greenwich, to that which gives the sun a breadth of but a very small fraction of an inch.

Those photographers whose object-glasses have an effective ratio of aperture to focus not exceeding 1 to 15 or 16 will be well advised to discard any form of equatorial mount or driving clock, with its liability to shake, and insidious temptation to over-expose, and, rigidly fixing the camera, to give exposures not exceeding one second as a maximum.

Both before and after totality a series of photographs should be taken of the partial phase. Since but one photograph has as yet been obtained of the corona after totality was well over, no definite rules can be laid down as to the style of instrument that should be employed. Therefore, in this next eclipse, all sorts of cameras might be pressed into the service, and some range of exposure should be given. One thing is certain, that in all cases the development must be carried out with the special object of restraining the high lights and giving opportunity for the feeble radiations to register.

Mr. Nevil Maskelyne will kinematograph the corona at his station in America. A most interesting and instructive use for the kinematograph in the coming eclipse would be its adaptation to the experiments which Miss Gertrude Bacon carried out in India on the illumination of the landscape during the partial phase. In a series of five photographs, taken at equal intervals, Miss Bacon found the curious fact confirmed (hitherto believed to be an optical illusion) that the illumination returned more rapidly after eclipse than it diminished before eclipse. The kinematograph, if used for this purpose, would give a more even and continuous series, and, if it were possible to use more than one in the same locality, would decide whether the same effect held good when the in-

* THE BRITISH JOURNAL OF PHOTOGRAPHY, December 15, 1899, p. 788.

† THE BRITISH JOURNAL OF PHOTOGRAPHY, March 31, 1899, p. 196.

ument was pointed in the direction from which the shadow was proaching and towards which it was receding.

Akin to this observation is that of the general illumination of the corona, which may be determined by very simple photographic sensitometers. In India this was determined photographically by Mr. E. W. Hanson (using a sensitometer constructed by Mr. Gare) and by the Rev. M. Bacon, and visually by Mr. T. W. Backhouse and Dr. Irwin Sharp, at Buxar, and by Mr. Mauder at Talni, by comparing it with the evening twilight illumination.

Spectroscopic observations of all sorts will be made, from those with slit spectrometers or object-glass prisms to those with the humblest portable prismatic opera glass. Observers with the latter will probably confine themselves to the shape of the corona as seen in the green strontium ring, the red and blue hydrogen, and the yellow helium rings. To attain the same object without a spectroscopic apparatus, Mr. Hackleton suggests that it would be well to photograph the corona by light as nearly monochromatic as possible, obtaining this partly by using film of special colour sensibility, and partly by the use of a colour screen.

There are two classes of work that have been very generally omitted from systematic observation in recent eclipses. These are the observations of the shadow bands, of which very little is as yet known, and the visual study of a small portion of the inner corona. The latter is especially important for the true understanding of the curious formations that in photographs appear to enwrap the brighter prominences, and which lie at the base of the great rays and the polar plumes. Only a very small portion should be attempted by any one observer, since the time of totality is very short, but the study of that portion should be thorough.

ARTISTIC COPYRIGHT.

ROM the last number of the JOURNAL we were obliged to omit the principal portion of the discussion which followed the reading of Mr. Bale's paper on Artistic Copyright at the Society of Arts last month. We here append it. Some remarks on the discussion appear in *Ex aethera* this week:

Mr. Frank Bishop desired to say a few words on behalf of photographers, who he considered had not been treated fairly in this matter, the Bill having been settled without consultation with them at all. From commercial point of view, photography was probably more important than painting; but a few artists met and drafted a Bill without taking the opinion of photographers about it. He also objected to a photographer being compelled to register every work within six months, or lose the copyright, whilst the artist was not. This was unjust, and would be a tremendous tax on photographers. What was copyright? It was rather a puzzle; but, after reading the article upon it in the *Encyclopædia Britannica*, he had a clear idea in his own mind that copyright was property, and demanded the protection of the law. The law gave protection against robbery, whether of a penny or 10,000. It was quite true a photograph was not a painting by Millais; but photographers could do all they could to assist artists if they were asked, although they expected some consideration in return. They were not so powerless that they could not protect themselves, and he thought the painters could find out in time that they had made a great mistake. If copyright as property, why need you register? Registration was only needed to mark an act of transfer of property. Ever since 1862, photographs had been claimed as fine art—he would not discuss what was art and what was not—that was the classification then adopted, and why should it be altered? Was photography of any less importance now, or were its productions any less perfect? On the contrary, it had made great strides, and many painters, if they were sincere, would acknowledge they owed much to photography.

Mr. Alfred East, A.R.A., said he was under the impression that photographers had been duly considered. He had great sympathy with artistic photography, and the artistic photographer had the sympathy of every artist. He could not see the point of Mr. Bishop's observations when he said that their claims were not considered. In no country in Europe had they such privileges as under this Bill; thirty years' copyright for a photograph was surely an equivalent for the protection given to the creative work of the artist; in fact, he should be inclined to say it had an undue advantage, in the light of the protection given in France and elsewhere. The point of Mr. Bishop's complaint was that they were not consulted in the draughting of the Bill, but surely that was a very minor matter; if he was willing to accept the benefits, he need not mind the method by which they were conferred. Many inquiries were made of eminent photographers, and he understood they were satisfied with the scheme suggested in the Bill. Photography was, in fact, introduced into the Bill as an afterthought. He should be the last to deny the right of photography to protection, or that many photographers produced works which were on a much higher artistic level than ordinary commercial photography, but protection for thirty years for a thing which cost the

producer so little, comparatively, to a fine work of art, which was the result of many years of special training and special capability, seemed to him ample. He must protest against the notion that the artist photographer had not been duly considered.

Mr. J. J. Elliott said he had listened with interest to the pathetic description given by Mr. Scrutton of the difficulties of the would-be pirate, whether proprietor of a journal or not, who wished to make use of the brains and money spent in producing a good photograph, in ascertaining whether it was copyright or not, and he should like to ask Mr. Scrutton or Mr. Bale why the so-called artist, because he painted half a dozen pictures in a year, should be exempted from registering, when the poor photographer, who produced thousands, was compelled to register.

Mr. Snowden Ward said he was sorry to hear an artist, so sympathetic to photographers as Mr. East, misrepresent the speech of Mr. Bishop. The complaint that photographers were not consulted was a very minor point, their real grievance was one of vital principle. At present the law was that the creator of a work of art had an inherent copyright in it, and what photographers objected to was the suggestion in the new Bill that Copyright was to be dependent on the creation of a work of art, *plus* registration, within six months of its production. He would not go into details, or he might point out what practical difficulties would result in many cases. Mr. Scrutton said there were only two alternatives—no registration or compulsory registration. Mr. Bale, however, was not of that opinion, because he said there might be a third course, which was adopted in Continental countries. Photographers felt that inherent copyright was a thing which ought not to be attached or taken away, and the statement that there were only two ways of dealing with it seemed not quite correct in view of Continental experience.

The Chairman said the Committee which set about draughting this Bill started with painting, but found that photography was so intimately connected with art that it had to be included; they sent a copy of the Bill to the photographic societies with the request that they would be good enough to express their assent or dissent. He did not think they received an answer from any of those societies. He could not enter further into the discussion of how far photography was a fine art, or how far artists thought it might be lightly treated. Mr. Bishop had put it on the right ground, viz., that it was of much greater commercial importance than painting; and he did not think it was right to claim for work of such great commercial importance the same rules and laws as art, which had really very little commercial capacity. A good deal had been said in favour of the Bill, and a good deal against it, but he was sure all would agree in passing a cordial vote of thanks to Mr. Bale for his paper.

Mr. Bishop said, when Mr. Storey brought the Bill before the Royal Photographic Society, it was in print, and, when asked if it would be altered if they made any suggestions, he said no. He was therefore practically right in saying that the painter did not consult the photographers.

Mr. Storey said he did not remember saying the Bill could not be altered; at that time it was merely tentative.

Mr. Bale said he had purposely refrained from introducing any question as to the relation between photography and fine art, which was one of those endless questions which could never be settled. The photographer said one thing and the artist another, but still he found that some of the best exponents of photography, such as Dr. Emerson, said that photographing was not fine art, it was photography, and never could be anything else. An artist could do a great deal in the way of arranging a picture and so on, but that was only preparatory; when you came to take the photograph, it was photography and nothing else. An artist might be a photographer and a photographer might be an artist, but the two things could never be mixed up. One was science and the other was art. Some photographers thought this Bill was an attack on them, but he had tried to make it clear that the object was to remedy the inconsistency at present existing, and which put the artist at a disadvantage compared to the photographer. The artist had scarcely any privileges at all, while the photographer had everything. His copyright was never questioned. Mr. Elliott asked why the artist should keep his copyright without registration when the photographer was called upon to register. The Bill divided art into two classes—original art and reproductive art, including photography. It assigned two terms—life and thirty years to the artist, thirty years to the reproduction artist and the photographs—because, as shown in the paper, the position of the artist was so different, and this, bear in mind, is the recommendation of the Royal Commission. It was absolutely necessary if you gave the photographer a fixed term that he should register, because you must give the public the information. Mr. Ward thought there was a difference of opinion between Mr. Scrutton and himself with respect to the need for registration, but that was a mistake. He had pointed to another system, adopted in other countries, which was simply a substitute for registration and answered the same purpose. It was recognised everywhere that it was absolutely necessary the public should know when a copyright terminated. It was not fair to punish a man for infringing a copyright without letting him know when the period began and ended. The information was given in the case of the artist under the Bill because, if there were no registration, a person wishing to copy could go to the artist and inquire; the photograph, dating from a particular time, must be entered somewhere.

Mr. Elliott said photographers were considered, thirty-six years ago, to be entitled to the same protection as artists, and he could not see why, after all the advance photography had made, and was still making, photographers should now be put on a lower level.

Mr. Bale said it was difficult to reply to a matter of sentiment. Mr. Elliott thought the photographer was degraded, as compared with the painter, by this Bill; but he had tried to show that, on the contrary, the object was to bring the painter up to the level of the photographer. He believed thirty years was long enough protection for a photograph, but the two terms were arranged to meet the requirements of the two kinds of work involved in fine art, and in photography and the reproductive arts.

THE COMPOSITION OF A PICTURE.

[Reprinted from the *Transactions of the Edinburgh Photographic Society*.]

THE art, or I might say the knack, of composing a picture is a very important one, and is, to a great extent, a gift from nature. At the same time, like many other gifts, it can be cultivated by practice, as public speaking can be, and become comparatively easy to the student or artist.

Mr. Stacy Marks, R.A., in the course of an inaugural address to the students of the West London School of Art, in January 1880, said: "The facilities for the cultivation and study of art had, within the last forty years, become so numerous, that we were in danger of having too many painters of pictures. Everybody who had good eyesight could be taught how to paint and draw up to a certain point, but invention, feeling—all the qualities that go to make the painter as distinguished from the mere mechanist—could not be taught, but must be born. Our exhibitions, he grieved to say, were full of specious and bad pictures, painted by men who, with more humbleness of aim, might have been admirable art-workmen. Good art might be shown in a variety of ways, and the man who designed a good paperhanging, an effective piece of metal-work, or a good tile or pattern, was as much an artist, though in a lesser degree, as a painter or sculptor. It was much better to do a little thing thoroughly well than a great one badly, and he who could produce a well-designed chair or book-cover did more real service to art than he who painted an inferior picture."

Within the last thirty or forty years there has been a great change in regard to the treatment or method of composition. The old conventional lines have been to a great extent abandoned, and we find that newer methods have been adopted.

In landscape, for instance, we have the natural and truthful compositions of such works as those of John Constable, David Cox, Cecil Lawson, and others, in direct contrast to or with the mechanical arrangements of some of the earlier English masters of this century, such as Wilson, Stansfield, and others. Thomas Gainsborough was an exception, and broke away from conventionalism even in his day. There is no doubt that some of his best landscapes have had considerable influence on early British art during this century.

In regard to figure pictures, the change is even more noticeable. The somewhat hard and crude compositions of such artists as Benjamin West, Daniel Maclise, E. M. Ward, and others of less note, have been gradually improved upon by the modern schools of painting.

The use of the lay figure was no doubt much to blame for the mechanical way in which these artists worked. In these days most pictures are painted from the living model, and hence we have a healthier state of matters.

The works of the greatest masters of this century are good example of simplicity, truthfulness, and naturalness in composition. Breadth of effect, and balance in light and shade, are most predominant, while colour is subdued and rich in quality. We all know the names of Millais, Burne-Jones, Tadema, Orchardson, Pettie, Luke Fildes, MacTaggart, Paul Chalmers, and many others that I could mention. These men will, no doubt, rank amongst the leaders in figure painting towards the close of the nineteenth century. Some of the earlier masters of the English school, such as the Sir David Wilkie, John Philip, Fred Walker, and George Mason, had influenced several of these artists, and it is to them that we owe much of the success of the more modern painters.

These works, along with those of Constable, Turner, and others, will rank amongst the art treasures of the world, and will compare favourably with the masterpieces of the Continental schools. I cannot do better than commend the study of these masters' works to the student, either of art or photography. If you cannot get access to the original paintings, you will be able to see reproductions at any of the art galleries or free libraries.

There are many books published on the subject of composition, but in my opinion there is nothing like practice or observation for the amateur or student.

A lawyer friend of mine was anxious to learn skating, and informed me he was going to buy a book on the subject. I, of course, advised him to get a pair of skates and go to the ice, and learn by experience. The theory in anything is all very well, but, unless it is put into practice, there will be no perfection.

An earnest student, either in painting or photography, will very soon pick up a lot of knowledge from diligent observation and continued

practice in composition. If intelligence is applied to hard work, success is sure to come eventually, but patience is also required.

The black-and-white student, of course, may see a landscape or figure study quite in a different light from the artist, who is sometimes fascinated with the colour rather than with the light and shade.

It is impossible to fix any rules on the subject of composing a picture with any degree of definiteness. Nothing but experience can really teach.

As far as my own imperfect knowledge goes, I shall endeavour to explain my own individual method, acquired by continued practice and observation within the last twenty years or so. I do not, however, suggest that my method should be adopted as perfect, but that it might be improved upon wherever possible, and if in accordance with the ideas of the student.

In the choosing of a subject direct from nature, it is most important that the best point be selected. It is therefore necessary that the student be not content until he has arranged the subject from which he can get the most pleasing and artistic results.

As a preliminary, a good way to focus a subject is to hold up one of the hands—so, but a little experience will soon educate the eye to grasp the best point of view. If it be painting, the student will soon learn what to omit or what to modify in the subject. On the other hand, if he be using the camera, his hands will be tied, although he can still ensure that his subject is taken from the best point possible.

If care is taken to secure the best position either for painting or photography at the beginning, this will save much trouble and valuable time as well.

It often happens that a very slight movement, either to the right or left, will so change an object that that which was a defect from one point of view becomes a beauty from another, and *vice versa*. I have also found in my own experience that a subject improves often after it is committed to paper or canvas, but I have also experienced the reverse. Therefore, although the search be somewhat tedious at first, it will save much trouble and even expense afterwards, because there will be no wasted plates or unnecessary waste of paint, if the artist has thoroughly satisfied himself that he has secured the best point of view.

One of the most important things for a student to remember is, that he must not attempt too much. Beginners, both in painting and photography, are apt to overlook this, and to think that the more they can show in their picture the better it will be. This idea, of course, proceeds from the want of knowledge and experience, and, with a little practice carefully directed, it will soon become obvious that this idea is quite a mistake. All the best pictures, as I have pointed out to you, show simplicity of design, and, even where a panoramic view or large group of figures are painted, there is always one central object or figure to which all the rest of the picture is subdued or subordinated. In the painting of a portrait, for instance, it is always important that everything should be subordinate to the head.

One of the greatest difficulties the young student has to deal with at the commencement of his studies is to know what to put in and what to leave out of his picture. In painting, as I have said before, it will be found necessary sometimes to modify or even omit some parts of the subject altogether. A telegraph wire sometimes intrudes itself upon a picturesque street, and may spoil the beauty of it. In this case it is better to leave it out of the picture altogether.

Should the camera be in use, this will, of course, be impossible, but the student can still make sure that the picture is taken from the best point of view.

When I was a student at the Royal Scottish Academy, I sometimes went out sketching with some of the older students, and can remember my early experiences. On one occasion, I remember we went to Newhaven, that favourite resort of Edinburgh artists, and found a subject out upon the pier. I was the youngest student there, and had done very little sketching from nature before, but my two companions were both pretty good painters. We had not worked long before we soon collected a crowd of boys and girls to watch us. This, of course, made me nervous, but my efforts were soon rewarded by our "would-be critics" remarking that my picture was the best. This, of course, I knew could never be the case, but my crude attempts were easier understood to these boys and girls than my student friends' work, which was too advanced for them to follow. I have always found, in my artistic career ever since, that the people who know most about art and pictures are the most sparing with their criticism. But to our subject.

If we examine a painting by a greater master, we will find that there is a balance in the composition. The eye instinctively travels to a certain part of the picture, and this is the spot to which the artist intended the spectator's eye to rest upon. The other parts of the picture are all there, but every part is subdued, and holds its place in relation to the most important part of the picture.

If, for instance, the subject be landscape with, say, trees, hills, and water, the trees will generally be the principal object, with reflections in the water, perhaps, and hills in the distance. If, however, the subject be a figure composition, the principal object will be the foreground figure or figures, and the middle distance and background will be subordinated to these. Take the well-known picture of *Napoleon on board the Bellerophon*, by W. Q. Orchardson, R.A., and you will see exactly what I mean. Napoleon is seen standing on the deck of the ship with folded arms in

the foreground of the picture, while his officers are very cleverly and naturally grouped in the middle distance, while the eye is carried intuitively out of the picture to the sea and sky beyond.

The arrangement and composition of this picture, including the rich colouring for which Orchardson is so well known, all go to make this one of the greatest masterpieces of British art. It is satisfactory to know that this fine work of art has been secured by the Chantrey Bequest, and may be seen in the Tate Gallery in London. The picture has been etched, and copies can be seen at most of the printsellers'. I am sorry I have not been able to get a lantern slide of this picture to show you.

There are other well-known pictures, which I might refer to, as demonstrating what I mean as good examples of composition, but, instead of doing this, I will call your attention to a very popular picture by Luke Fildes, R.A., called *The Village Wedding*. This picture, though exceedingly clever in many qualities, is, in my opinion, what I would call a crowded composition, and is wanting in simplicity of arrangement and general effect.

It is one of Mr. Fildes' earlier works, and he is seen to much more advantage in his famous picture of *The Doctor*, so well known by the reproductions which are seen everywhere. Here we have another splendid example of a pathetic incident, simply but powerfully treated. I remember seeing this picture at the Royal Academy when it first appeared, and was very much struck with the sentiment which it conveys. This picture was awarded the centre position in the great room that year, about 1889 or 1890, and was deservedly very popular.

The nation is again fortunate in having possession of another great picture, the late Sir. Henry Tate having presented it along with many others in his collection.

It was my intention to have a slide of this picture also as a good example of composition, but the copyright of most of these great pictures is strictly reserved, and it is a difficult matter sometimes to get permission. I have spoken of the arrangement in composing a picture, but the balance of light and shade is also very important to the success in making a picture.

If the subject be an out-door one, say on a grey day, of course there will be very little contrast or effect in light and shade, but under strong sunlight the same subject would be very different. It will, therefore, be evident that, if a picture is painted in sunlight, it will be much more difficult than on a grey day, although from a colour point of view artists prefer the latter.

One of the greatest masters in light and shade, as well as colour, is the famous Rembrandt, the founder of the Dutch school. No artist of any school has ever carried light and shade to the same perfection as Rembrandt, and most of us, no doubt, have heard professional photographers use the term "Rembrandt light and shade" for a photograph.

I may say that, personally, there is no other artist in the world appeals to me so much as this great master. Every time I go to the National Gallery in London, I never fail to feast upon the works of Rembrandt.

The depth of colour and breadth of effect, which gives such power to his work, is beyond all praise, and, so far as my art knowledge goes at present, he stands head and shoulders above any other painter the world has ever produced.

The modern schools of painting have all developed the influence of Rembrandt, but perhaps it is more evident amongst the modern French and Dutch schools than elsewhere. Joseph Israels, the Dutch painter, and G. P. Chalmers, R.S.A., were no doubt very much influenced by the works of Rembrandt.

In all the French ateliers there is very much stress put upon what the professors call "values," which means in this country "good tone." If a tree is darkened, or a foreground lightened, the painting will suffer or improve according to the tone or effect produced, but, when we find each object painted in relation to the whole effect, then we have "good tone," or, as the French term it, "values."

The modern "Impressionist School" depends almost entirely on "values" and light and shade, and this is just the other extreme of pre-Raphaelitism, which paid no attention whatever to tone.

The modern Dutch painters are, perhaps, the best examples for good composition, colour, and tone, all combined. Their works show a truthfulness to nature, combined with rare artlessness.

I am pleased to say that the modern British school is also paying great attention to tone or values, and there is no doubt that art in this country, within the last thirty or forty years, has made rapid strides, but it is for posterity to decide how the work of to-day will compare with the old masters. A German critic says: "The British school are the progressive party in the history of modern art; the French and Germans are the conservatives." "English art had this advantage in playing a pioneering part, that it had no old traditions to stand in its way; it had no great past. In the sixteenth and seventeenth centuries England had been content to offer hospitality to Holbein and Van Dyck, and to collect the works of foreign masters in her galleries. Her art sprang into existence suddenly and unexpectedly at the beginning of the eighteenth century, and thence developed exclusively on native lines." The same writer says we British live in an age in which freedom has arisen. Our civil liberty affords us a sufficient foundation, and our liberty conducts us to the absolute verity in art. All beauty is truth; the search after truth leads you to nature. Truth is the mightiest thing in the world, since it exercises

sovereign rights over the creation of the imagination. The character of British painting is apparent. It proceeds from an intellectual impulse, not only does it strive after beauty of form and physical development of sensuous grace, but in the first place after intellectual expression and sentiment.

From these and such like remarks it will be readily understood that this nation takes a prominent place in the art history of the world.

Let us who are still students aim at high ideals, so that we may be worthy successors of those who have gone before. We may not all be successful, but, if we have cultivated our talents to the best advantage, we will have the satisfaction of knowing that we have done our duty.

HENRY JOHN DOBSON, R.S.W.

GLEANINGS FROM AN EXHIBITION CATALOGUE.

THE catalogue of the South London Photographic Society's Exhibition, open this week, contains a number of helpful articles by some of the leading members of that Society, from which we take a few extracts. On the subject of Stereoscopic Photography, Mr. John T. French gives the following hints in regard to the selection of apparatus:—

"I prefer a half-plate camera, one with a square bellows is the best, although some cameras with a taper bellows can be adapted by making a division to hook on to the inside of the front and back; it need not be the exact depth of the camera, an inch or so top and bottom is not material. It can be made from a piece of black sateen, say 8 x 5 inches, which will allow for a hem top and bottom for a piece of elastic to run through, with a loop at each end to hook on to the four corresponding hooks, two on the reversing back and two on the inside front, the object of the elastic being to allow the division to expand or contract with the racking in or out of the camera; or, if expense is no object, a small spring roller division can be purchased, price about 5s. An extra front, with a pair of 5-inch or 6-inch focus lens exactly paired, either single or rectilinear, as may suit the pocket, mounted from 2½ inches to 3 inches apart from centre to centre, completes your outfit, so that, having your ordinary front and lens, and carrying half-plates in your slides, by removing or adding the division, you may take either stereoscopic pictures or half-plate size at will. In taking a stereoscopic picture, be careful to see that both your lenses are stopped down to the same aperture, otherwise, on developing, you will wonder why one half seems exposed more than the other.

"By using a half-plate you get (providing your lens will cover) each picture 3½ inches wide by 4½ inches deep, less the rebate in dark slide, so that in printing you can leave out either sky or foreground, or a little of both, as you may desire."

Lantern-slide making is Mr. Edgar R. Bull's theme. In the course of his article he gives the following hints on development:—

"From thin negatives I endeavour to work on dull, cloudy days, if possible, and use a slow brand of lantern plates, taking care not to over-expose. Develop with hydroquinone, 1 ounce; water, 1 ounce; with a few drops of bromide added, thus striving to obtain contrast. Should, however, the high lights begin to show traces of veiling before the slide is sufficiently strong, development should be instantly stopped, the plate washed and fixed, again wash, after which it can be brought up to strength by intensification. I have found the following satisfactory, by which means a good strong slide of brownish-black colour is obtained. Bleach the slide in a solution of bichloride of mercury until white throughout, after well washing, to be followed by a bath of about 20 minimis of ammonia (880) to each ounce of water. To ensure success, care must be taken that the washings are thorough after fixing, and between bleaching and using the ammonia solution, otherwise stains will occur. For strong negatives just the opposite procedure is employed, bright days selected, proportionately increased exposures, and diluted developer used, say, hydroquinone, ½ ounce; metol, 1 ounce; water, 2 to 4 ounces, according to the density of negative and effect desired."

"For subjects having extreme contrasts of light and shade—take, as an example, a dark interior with clear glass windows in field of view—I should give a full exposure, and commence development with hydroquinone, ½ ounce; metol, ½ ounce; water, 2 ounces (having in a separate measure, metol, ½ ounce; water, ½ ounce; also a small camel's-hair brush). When development is about half complete, rinse the plate with water, and then carefully go over the highest lights, or other parts that hang back, with the brush and metol solution, until the details have been sufficiently brought out; then again pour on the original developer until completed. It is surprising what differences can be effected by this way of working against the ordinary method. Other instances of local treatment with the brush will, no doubt, suggest themselves to the worker."

Mr. C. Churchill offers the following method of negative classification:—

"Make or obtain an open wood box, the aperture at the top being equal to the aperture of the dark slide, a rebate being formed on the top inner edge, in which the negative lies as in the dark slide, obscuring the transparent margin so that only the developed portion is seen from underneath. For a half-plate negative the box should be about four inches deep, having a peep-hole in the side and a little door at the end.

The negative, as I have already stated, is laid in the rebate on the top, film down, the actinometer, already charged, is slipped through the little door, and the effect of the light passing through the negative upon it is watched through the peep-hole.

"For this work it is best to choose a bright day, when there are no clouds about; the light then is fairly constant, and more work can be done, although the process is workable at any time.

"We will now assume that we have four negatives to deal with, and in using the box as I have first described it is also necessary to take the time of the actinometer for the light falling upon the negative outside, as well as that which affects the actinometer underneath it.

"Suppose the following results are obtained:—

	Under negative.	Over negative.	Comparative factor.
A	20	÷ 5	= 4
B	25	÷ 5	= 5
C	60	÷ 10	= 6
D	110	÷ 15	= 7½

By dividing the one by the other, we obtain a figure which we will call the 'comparative factor.' This, scratched on the edge of the negative with a sharp point, will be always available for future use.

"For the application of this factor we will assume that we have found out that a P.O.P. print from negative A requires 28 minutes when the actinometer value of the light is 10; then 28, divided by the comparative factor 4, gives a constant of 7, which permanently becomes our multiplier for this process.

"Under the above conditions the other three negatives would require:—

$$\begin{array}{lll} B & 5 \times 7 & = 35 \text{ minutes.} \\ C & 6 \times 7 & = 42 " \\ D & 7\frac{1}{2} \times 7 & = 52\frac{1}{2} " \end{array}$$

Should the actinometer time be 20 or 5 instead of 10, as taken in the above example, the time for printing must be doubled or halved. Although we prefer to judge our prints by looking at them, we can by this means learn the time the printing frames can be left to themselves, and give instructions to others when to take them in during our hours of travail. This system can, perhaps, be better used in carbon or platinum printing, and also in lantern-slide making. The chief thing is to obtain a constant rack process from a standard negative; the other part is simple."

"Clouds" afford Mr. G. J. T. Walford the opportunity of making the following suggestions:—

"Well-marked storm and sunset clouds may be said to require no exceptional treatment; an ordinary plate, a medium stop, a quick hand exposure, should produce a satisfactory negative. Light, fleecy clouds on a summer sky, and clouds of a stronger nature, but illuminated from the front, should be photographed on a slow isochromatic plate, with a yellow screen, and rapid exposure. Yellow sunset clouds should also be taken on an isochromatic plate and with yellow screen, but the exposure will be longer. Red sunset clouds had better not be attempted, as they are seldom satisfactorily treated photographically; however, the conditions of success in this case are as follows: the use of a spectrum plate sensitive to red, a suitable colour screen, and correct exposure. To attempt to photograph such clouds without complying with these conditions is simply a waste of time and materials, and is foredoomed to failure.

"When photographing clouds, it should be remembered that three things concerning them are calculated to impress our minds and influence our selection: (1) form, (2) lighting, (3) colour. In our work we must be guided by the first two only, the formation and lighting of the clouds. However the colour may charm, we cannot reproduce its tints; consequently, if their great recommendation is beauty of colouring, such clouds had best be passed over as unsuitable to our purpose."

PHOTOGRAPHIC RECORDS.

At the meeting of the Photographic Club, on February 28, Sir J. Benjamin Stone, M.P., who was kind enough to attend in support of the objects of the National Photographic Record Association, of which he is President, and an exhibition of whose work was arranged round the room, made some interesting remarks about the aims of the Association. It was a great pleasure to him, he said, to be able to make a few observations in encouragement of those in whose power it was to do so much for the Association of which he was the head. He had been exceptionally favoured with access to some of the most interesting relics which the country possessed for the purposes of photographic record, but still every one may do excellent work in a smaller area. It was a matter of extreme importance to the future generation that objects and events now common should be preserved and handed down, and it was astonishing what great secrets could be exposed by putting together what looked like insignificant details. If he were merely a literary man engaged in writing a history of some county, period, and subject, he would make notes as he went along for future elaboration. But it was infinitely easier to take photographs.

They were far more complete than any literary composition could ever be. He went on to show how the humble tomb in the village churchyard was but a development of the ancient cromlech of this country in its pagan days, and what an interesting tale they told, arranged in chronological sequence, of the evolution of the modern tomb. None of these cromlechs, or their later forms, in themselves were of much interest, but, pieced together, they made a wonderful chapter in history.

The work of the Record Association must be based, then, on attention to details, however small and insignificant. The slightest difference between any two things—the tombs of which we have just heard, or anything else—was a thing to be recorded. It told a tale which was necessary to build up the chain of history. To suggest a moral, he would say, Despise nothing at all, because of its familiarity. Get it by all means, and store it away. As with tombs, so with coins and tokens of prehistoric times. In many cases, the only existing records of kings, princes, and leaders of peoples in ancient times consist of these very coins. By their means the sequence of reigning heads in times prior to written history had been handed down. Sir Benjamin Stone told a delightful tale of the evolution of a certain coin. Its design had been carefully traced through successive years to one of the most beautiful coins ever made, and that by Philip of Macedon. What he had said he hoped would have its proper effect. Nine-tenths of the work that he himself had been doing, at Windsor, the Tower, Westminster, &c., would, he knew, fail altogether to be appreciated by the present generation, and it was quite natural. These records were nearer truth than words could be, and the motive for taking them was that of the historian and nothing more. If his word, Sir Benjamin concluded, would increase the numbers of workers in the preservation of pictorial records, he should be satisfied, and he earnestly appealed to those present to throw themselves heartily into the cause.

A number of lantern slides were shown, indicating the nature of the work being done. Mr. G. Scamell, the Hon. Secretary of the Association, stated that upwards of 11,000 prints had been collected and deposited in the British Museum. The Association now looked to the co-operation of the societies and photographers of the country, and, if to this end centres could be formed for the reception of prints, a great impetus would be given to the scheme. Whole-plate prints were preferred, but the official mounts would take two half-plate or four quarter-plate prints. Platinum or carbon prints, or by any known permanent process, only were received, and they could be addressed to 66, Russell-square, W.C.

Mr. W. R. S'retton, in the course of some remarks, expressed the belief that the Club might do a good deal by becoming agents, as it were, for the National Photographic Record Association. Familiarity bred the contempt of many beautiful spots and historical associations which were close at hand, any of which might cease to exist at short notice. He therefore had pleasure in moving that a Committee of the Photographic Club be appointed to take the necessary steps to act for the best interests of the Record Association.

Mr. F. Haes seconded the motion, which was duly carried, and with which Sir Benjamin Stone expressed himself as much gratified.

A vote of thanks was passed to Sir Benjamin Stone.

THE MULTITUDE OF PROOFS.

"THREE finished proofs submitted with each order for one dozen cabinets." Such or similar is the announcement that appears in so many photographers' price-lists nowadays. Does the practice tend to enhance the public appreciation of their photographs, or the reverse?

Let us try to imagine Reynolds or Millais, for instance, painting half a dozen different portraits of their sitters, and giving them their choice of the best.

Is photography so low down in the scale of things artistic that what would seem absurd and irrational in one case is quite the correct thing in the other? A portrait is a portrait, a work of art, be it on canvas or in carbon tissue, on porcelain or in platinotype, and needless duplication merely tends to vulgarise and lower its value.

"Oh, but," photographers say, "the sitters are easier to please if they have three or four proofs to choose from, when, perhaps, one only would prove unsatisfactory."

Why so, if it is the best one? An artist will make, perhaps, many sketches and studies before he completes his finished work; so, also, may his brother of the camera take several negatives, only showing the print from the one he considers most likely to satisfy his critical and exacting customers.

It is a settled delusion with some that several proofs will obtain a larger order than a single one. Of course, if this were so, the matter is settled, for we cannot afford to ignore the commercial aspect of the question. But is it really so? The sitter, presumably, does not burden himself with more photographs than he or she actually requires, and is, on the whole, more likely to loosen his purse-strings over one well-admired portrait than two or three of rival and clashing merits. Do we not all know the state of helpless despair some people are reduced to when they have to decide which proof to sanction? The Judgment of Paris were trivial in comparison. Friends and relatives are anxiously canvassed, and, perhaps, even the photographer's own preference sought for, though not received with too much reverence. Finally, in all probability, the one not

particularly cared for by the sitter is chosen, with lurking misgivings, in deference to a majority of other opinions, and that order is not so large as it might have been.

In the National Gallery may be seen two portraits of Cardinal Richelieu, in slightly different positions, framed together. Either of them is a masterpiece, instinct with character and vitality, showing perfect technique in every inch; and yet, seeing them together, one is conscious of a vague sense of disappointment. If we hold up a hand, so as to block out one of the pictures from view, the immediate gain of the other in interest and effect is surprising. The moral is sufficiently obvious and easily applied. Not only do two nearly similar effects in juxtaposition clash with and disturb each other, but one of them, also, is always in some single respect better than the other, and *vice versa*, and so they each serve only to point out their neighbour's deficiencies, instead of emphasising its merits.

But revenons à nos moutons. Let us suppose we have three proofs of the same individual, varying but slightly in position and lighting; it is almost certain that one of them will do more justice, for instance, to the sitter's eyes, another has not such expressive optics, but the nose is pronounced "just lovely," while the third has got such a nice mouth that it would take honours easily, only "the eyes and nose are not so nice as the others." The result is probably not quite so satisfactory from a purely commercial point of view as could have been wished; indeed, the unfortunate photographer will most likely be required to produce, after a resitting, yet another proof, that shall combine the good points of all the others, nearly always an impossible task.

Yet another argument against a multitude of proofs is the large amount of extra work they involve, and the inevitable necessity, in so many cases, of "rushing" the retouching and finishing. Be it artistic or not, there is no question that the amount and quality of the pencilling on the negative has a great influence on the sitter's mind, where all else may fail to attract his notice. Now, where there are stacks of negatives to be got off post haste, how can the unfortunate knight of the pencil be expected to devote too much time to each? Here is the genesis of most of the rough and hurried-looking finishing of to-day. How much more sensible it would be to do less and do it better! Is not the real secret of business success to give the best possible value to our clients, not in quantity but in quality? The by no means undiscriminating public soon learns this palpable fact, and gives its patronage accordingly to the man who has the sense to act on it.

The question of time also crops up in another direction. This is an era of sharpness and promptitude; our customers expect their proofs within a few days, and photographers themselves best know how often this fond hope is perforce disappointed. Perhaps enough has already been said to indicate at least one of the causes of delay, if not the principal, and the means of its avoidance. "Would you believe," said a lady to me once, "So-and-So has actually kept me waiting more than three weeks for my photos?" "Ah, madam," I replied, "how many proofs did you have?"

Photographers are such a conservative race, ever moving in a time-honoured groove, doing what their grandfathers did before them, and slavishly copying one another's methods, or perhaps the system complained of would not be so prevalent. "Oh!" they say, "A or B do so-and-so, and it pays them. Therefore, of a certainty, it will be the best thing for us to do." And, accordingly, they do it, and wonder dolefully why business is not what it used to be, never seeming to suspect for a moment that perhaps their own lack of originality and ability to adapt themselves to the ever-changing hour is principally to blame.

Regarding the question from a very bald and mercenary point of view, to give many proofs undeniably increases expenses at first hand, and reduces profits proportionately. I once heard a well-known man admit that, other things remaining the same, he would increase his turn-over at least ten per cent. by only giving one proof to each sitter, and a little calculation will show that, if anything, he rather under-estimated the result of the suggested change, for it is evident that less than half the former amount of retouching would have to be done, one-sixth of the printing would be saved, to say nothing of the gain in time and other things. And, as we must not selfishly forget the interests of the army of photographic assistants, they need not fear any possible loss of employment, for public appreciation of better work would stimulate business; besides which, no doubt, greater comfort and better conditions of labour would soon probably follow, to their general benefit.

Why is it that photographs are regarded with such slight respect as compared with paintings or engravings? Is not the reason obvious? It is not merely that they do not approach so high an artistic standard, nor that they are more cheaply and easily produced; it is mainly because we have made them too plentiful and commonplace, and have destroyed the public reverence for what we ourselves treat so lightly and they obtain with so little trouble, for it is a pretty universal weakness of humanity to value things in inverse ratio to the ease with which they are procured, on the principle that forbidden fruits are sweetest.

The practice of giving several rough or unfinished proofs does not deserve so severe a condemnation as that we have been considering, but must, at least, be described as risky and impolitic, for the generality of sitters are never greatly impressed with their counterfeit presentations in the state of fearless realism that the camera gives us before the gentle

and refining influence of the retoucher has made amends for nature's deficiencies. What even our clients themselves would probably consider the most sensible and practical procedure, if appealed to, is to take several negatives with all due care and consideration, and, selecting the best, devote all our artistic and technical skill to obtaining one satisfactory picture from it. How much more pleasure we should take in our work, and what a gratifying sense of having produced something worth keeping would be our reward! More immediate and tangible results, in the shape of increased receipts and reputation, would of a certainty follow in the wake of what, after all, as merely sentimental considerations, we could not afford to give too much attention to in a materialistic and profit-seeking age.

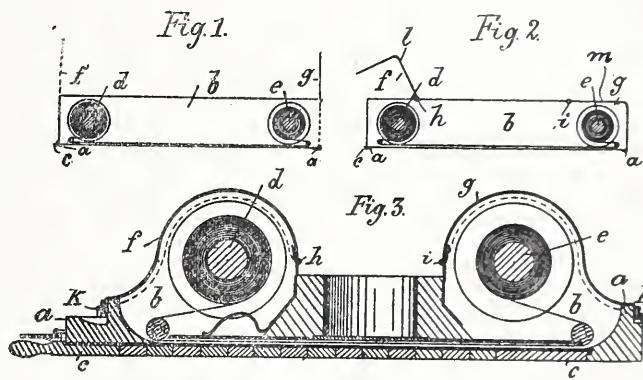
A. LOCKETT.

A ROLLER FILM-HOLDER.

[Patent No. 23,228 of 1899.]

THE invention of Mr. W. Beutler, of Berlin. The roller bearings, gear, and draw table are inseparably connected to the film box, and are rendered accessible by the opening of the sides, and, it may be, of parts of the back of the film box. By shaping the box to suit the rollers, the latter may be given plenty of room, while a considerable saving is effected in the weight of the box.

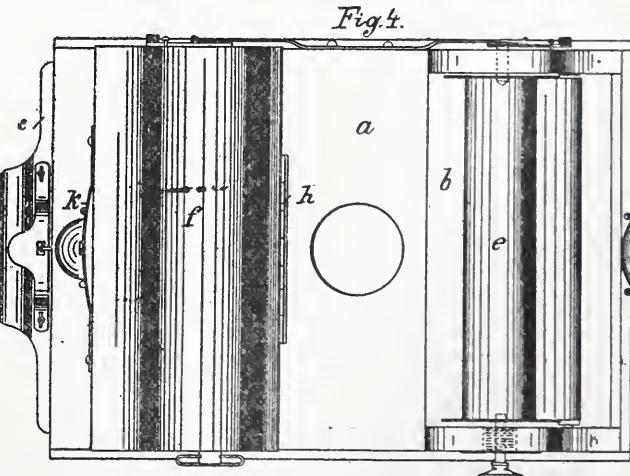
In fig. 1, *a* is the box frame, and *b* is the interior space of the box. *c* is the dark slide, which can be drawn back to expose the film, and *d*



and *e* are the film rollers. *f* and *g* are the sides of the box, which can be slid back, either horizontally or vertically, when it is desired to obtain access to the rollers and mechanism. By this arrangement the rollers can easily be fitted in or extracted, and the film may readily be placed in guiding grooves, to enable it to run smoothly.

Fig 2 differs from fig. 1 only in the fact that the sides, *f* and *g*, open on hinges, at *h* and *i*, instead of sliding open, parts, *l* and *m*, of the back of the box opening at the same time.

In figs. 3 and 4 the box is shaped to avoid all useless spaces, the back



being curved round the rollers. By this means a favourable position is obtained for the hinges, *h* and *i*, so that, when the lids, *f* and *g*, are folded back, the film rollers and mechanism are very much exposed and can readily be got at for manipulation. The lids, *f* and *g*, are preferably made of metal, say light plates of aluminium, whilst the rest of the box can be made of wood. By this arrangement it is quite possible to provide from outside, or from the dark slide, a handle which operates to indent the film so as to facilitate cutting it at a later period at the desired place.

A PRINT-OUT PLATINUM PROCESS.

[Patent No. 5304 of 1899.]

THE inventor, M. L. Hanriaud, in describing his process, the practicability of which is somewhat doubtful, says: "I prepare the following solutions:

" 1. A saturated solution of ferrous sodium oxalate for an ordinary temperature of fifteen to twenty degrees.

" 2. A saturated solution of protochloride of platinum.

" I take equal parts of solutions 1 and 2, and coat the paper or other support with a uniform layer of the mixture by means of a brush, which must be kept scrupulously clean. The prepared paper or other medium is afterwards dried, and is then ready for use.

" When producing prints by this process, the prepared paper is exposed to the light beneath the negative in the usual way. When the image has made its appearance, the paper or other medium is removed from beneath the negative and passed directly through various baths consisting of water containing one per cent. of hydrochloric acid, the print being then thoroughly washed in water for one hour.

" It is then only necessary to dry the print and mount it upon a card or other suitable support."

WAX SEAL IMITATIONS OF PHOTOGRAPHS.

[Patent No. 6122 of 1899.]

ACCORDING to the inventor, Mr. C. S. Jones, of High-street, Woodford Green, the photograph to be reproduced in imitation of a wax seal or other design is copied by means of a photographic camera, and a plate is produced containing one or more negative impressions. From this negative as many positive prints as are required are taken, or, where large quantities are required, they can be reproduced by means of one of the mechanical processes, such as collotype. The prints are subsequently coloured by means of a dye or other colouring medium to represent the colour of the wax to be imitated. Or they can be left uncoloured to represent white wax. The backs of the photographs are then gummed and allowed to dry. They are then embossed so as to represent a wax seal, and punched out of the sheet by means of a special die in a press. By varying the shape of the embossing die any shape of seal can be produced.

A slight variation of the mode of procedure above described, which specially lends itself to the production of imitation seals of a dark colour, is to punch out and emboss a suitable coloured paper, and then affix the photograph to it in such a manner that the imitation seal forms a kind of framework or border round the photograph. When this method is adopted, it is best to leave the photograph uncoloured, as the picture will not show up clearly if coloured with a dark dye.

GELATINE RELIEFS.

[Patent No. 21,692 of 1899.]

THE invention of Messrs. Heimsoeth & Co., of Cologne, who say:—

" A plate of plate glass is covered with a sensitive film of gelatine, and exposed under a negative or a positive, and the gelatine film converted by washing into a relief, this last mentioned relief forming the printing mould.

" In order that the gelatine ink may not remain adhering to the mould, it must be saturated in a suitable manner with oil or grease. As the relief completely soaked with water would repel the oil or grease, and at the same time care must be taken not to conceal the finer details, only a decomposed layer of oil or grease must be put on. This must be so effected that the gelatine, which is not very resistant, may be preserved against pressure or friction.

" The relief is, therefore, for a certain time, placed in a bath consisting of a solution of soap and water, and then in a ten per cent. solution of chromate of alum or of an acid. The soap in the gelatine film will be hereby decomposed and the gelatine completely saturated therewith. On the surface a scarcely perceptible trace of grease will remain, which, however, owing to its consistency, separates the gelatine ink from the relief completely. By a further treatment with oil the residue of grease can be strengthened.

" In printing processes with metal, resin, or other hard moulds, the latter hitherto had to be vigorously rubbed with oil with a flannel rag. This rubbing in of oil had to be repeated after every printing; consequently the delicate outlines of the relief were dulled by the frequent rubbing, and the prints wanting in sharpness. In the present process the mould is steeped with oil, and this oiling needs only to be repeated after a considerable number of printings. As the moulds are not continuously rubbed with oil, they last longer than those formerly used and made of metal.

" As the relief is formed directly on a plate of plate glass, and remains thereon during the printing, a permanent evenness is ensured in the moulds, and thereby a novel, rapid, and inexpensive method of printing from gelatine moulds created, as hitherto it has not been known that reliefs in gelatine could be employed for this purpose."

EXHIBITION OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE Eleventh Annual Exhibition of the South London Photographic Society was opened at the Public Baths, Church-street, Camberwell, S.E., on Saturday evening last, by an address by Mr. G. C. Whiteley, M.A., M.L.S.B., and will remain open until Saturday next, the 10th inst.

For a photographic society of the standing of the South London Photographic Society to hold an exhibition annually seems to us at the present time only a natural thing to do; and we are apt to forget to award the praise that is due to those who organize a work of such magnitude, not for their own personal benefit, but in furtherance of the aims of their Society and for the glory of photography. To run a big Exhibition for a week, to make it attractive enough to draw a sufficiently large audience at a nominal charge for admission, to leave a balance on the right side when the accounts are made up; to do all that is necessary in the preparation and carrying out of this work, in addition to following the avocation which earns the bread and butter, is more than creditable, it is praiseworthy. We are apt to forget, too, that in addition to the benefit the members derive from the opportunity of studying the works of their fellow-members, and comparing them with their own, such an Exhibition serves a most useful purpose in assisting in the education of the lay visitor in the capabilities of photography. We are told over and over again by professional photographers that the class of work that they do is that which the public insist upon having. We can quite believe there is a great deal of truth in this. The public are very conservative, and very many of them have never seen any other kind of photograph than a glazed silver print, and a glazed silver print therefore represents to them the ideal of a photograph. A better understanding of what photography is capable of ought to create a demand for work of a higher class, to the advantage of photography generally and the professional photographer of talent in particular.

The present Exhibition shows that the members are at least maintaining their position. Speaking of the Members' Classes generally, the best of the work is quite equal to any previously shown, while the tail end is distinctly improving. Still, a little judicious weeding out of some of the worst examples of misdirected ambition would have materially raised the general tone. In Architecture, in which the Society has heretofore excelled, the class was, on the whole, a disappointing one. Some of the work was quite up to the usual standard, but a considerable part only reached mediocrity. We notice a tendency to flatness in several of the pictures, which seems to arise from want of detail in the shadows of the original negative, the effect being intensified in enlarging. Some of the best work was shown by Messrs. C. Churchill, F. Goddard, E. H. Lamb, G. J. T. Walford, and C. W. Walker.

On the other hand, the Class for Portraiture and Figure Studies showed a marked improvement. Not only was the number of exhibits proportionately larger than one usually finds in a society exhibition, but a fair number of them were distinctly above the average merit. Naturally here, too, appears some of the work it was least desirable to hang, and a bad portrait or figure is more noticeable than a bad landscape. We have much pleasure in congratulating the Society upon the good show made in this class, and, if it means that the same special attention in future is to be directed to this kind of subject that architecture has previously had, there is even a greater scope for attaining a prominent position. In the class we especially noted as good or promising the work of Messrs. W. C. Boyce, A. Hunt, A. Glass, E. Mathews, C. W. Walker, and Mrs. Welford.

The Landscape Class, naturally the largest, called little for comment. Taken as a whole, it was a good average collection, and would have been a much better one for a somewhat rigorous selection. Some of the most ambitious of it was marred by the very evident attempt that had been made to copy the work of others, and naturally the faults were more faithfully copied than the excellencies. We noted in our catalogue work by Messrs. F. W. Bannister, F. A. Bolton, H. Esler, E. H. Lamb, P. H. Mason, J. Moyser, and C. W. Walker.

The Hand-camera Class, sensibly restricted to prints from the original negatives, was, we think, quite up to the usual mark, and the Beginner's Class, as one might expect,

The Class for Pictures taken on Excursions contained some of the best work in the Exhibition, thereby robbing the subject classes to which it belonged. There seem to be strategical reasons for instituting the class, but, for the benefit of the Exhibition, it is a pity that, if classes at all are necessary, a more rational system is not adopted.

The Members' Champion Class for pictures which have been medalled during the past year was an extremely creditable one to the Society. The nineteen pictures here exhibited at any rate proved that some of the members have done doughty deeds on other battlefields than their own. The lantern slides were numerous, and distinctly good in quality.

In the Open Classes the number of members of the Society competing was quite a feature, and three of the thirteen awards thus returned to the Society. Among the most prominent of the exhibitors were Messrs. W. Smedley Aston, F. W. Bannister, Graystone Bird, W. E. Brewerton, E. R. Bull, Mrs. A. M. Dumas, Messrs. Dudley Hoyt, C. F. Inston, W. E. Inston, E. H. Lamb, Viscount Maitland, Messrs. C. H. Oakden, C. Skelton Tyler, G. J. T. Walford, E. Atkinson, S. J. Beckett, A. Bedding, W. J. Byrne, H. Esler, Hilton Grundy, J. Kearney, jun., R. R. Rawkins, Leslie

Shawcross, Mrs. Welford, Messrs. J. Beeby, H. C. Leat, Eustace Young & F. Goddard, F. W. Gregg.

The trade exhibits were fully as interesting as usual, the principal exhibitors being Messrs. R. & J. Beck, Burroughs, Wellcome & Co., J. Griffin & Sons, J. E. Lockyer, Mackenzie & Co., the Prosser Roberts Drug Co., the Photographic Art Development Co., Rogers & Webster, and R. W. Thomas & Co. Demonstrations, cinematography, Röntgen rays, and Ives's colour photography were announced for each evening in addition to lantern lectures by such well-known people as Mrs. Catherine Weed Ward, and Messrs. J. A. Hodges, F. H. Evans, J. Carpenter, and C. H. Oakden.

We must not omit a word of praise for the catalogue, which, in addition to the usual matter, contained a capital series of six practical articles on photographic subjects by members of the Society, and we must also not omit to call the attention of those responsible to the unnecessary large size and prominent character of the labels used for numbering the pictures. The label, though necessary, is an evil, and particular care should be taken to place it so as not to spoil the picture.

JUDGES' AWARDS.

Members' Classes.

Class A (Portraiture, Figure Studies, and Animals).—Silver medal, W. E. Mathews; bronze medal, W. Page.

Class B (Architecture).—Bronze medals, W. H. Dawson, G. R. Nicholls.

Class C (Landscape, Seascape, and River Scenery).—Silver medal, C. W. Walker; bronze medal, P. H. Mason.

Class D (Hand-camera Work).—Silver medal, R. G. Goodwin; bronze medals, H. Esler, W. T. Tollett.

Class E (Beginners' Class).—Bronze medal, A. V. French.

Class F (Excursion Pictures).—Silver medal, G. Brown; bronze medals, W. Howell, T. Moyser.

Class G (Lantern Slides, sets of four).—Silver medal, E. Mathews; bronze medals, C. Churchill, C. F. Dickinson.

Class H (Members' Champion Class).—Gold medal, given by Mr. G. A. Maull, W. H. Rogers.

Open Classes.

Class J (Champion Class).—Gold medal, Dudley Hoyt; silver medal, Viscount Maitland; bronze medal, E. R. Bull.

Class K (Pictures—any subject).—Silver medal, E. Atkinson; bronze medals, R. R. Rawkins, C. Skelton Tyler.

Class L (Lantern Slides Champion).—Silver medal, E. R. Bull; bronze medal, R. R. Rawkins.

Class M (Lantern Slides).—Silver medal, F. W. Gregg; bronze medals, Eustace Young, S. J. Beckett.

Class N (Stereoscopic Slides and Transparencies).—Silver medal, F. Goddard; bronze medal, L. S. Wilkes.

Our Editorial Table.

FORMULES, RECETTES ET TABLES POUR LA PHOTOGRAPHIE.

DR. J. M. EDER. Paris: Gauthier-Villars.

THIS addition to the *Bibliothèque Photographique* is a translation by Monsieur G. Braun fils of Dr. Eder's work, and the publishers have had the volume carefully revised and brought up to date by the author.

It is an excellent collection of formulae for all the important processes of photography, and the book likewise contains a very valuable collection of chemical and other tables, which will make it a favourite with the experimental photographer.

AN EFFECTIVE SHOW-CARD.

By Messrs. Wellington & Ward, Elstree.

A NEAT little price-list of the justly appreciated "Wellington" papers has reached us from the Elstree house. The Waltonian hand is visible in the design on the effective red cover, and in company with the price-list comes a show-card which not only strikes the eye but pleases it. This measures about 20 x 13 inches, and it is made of cardboard over one-third of an inch thick. Upon a khaki-covered ground the words "The Wellington papers" are sunk in white enamel, while the pictorial embellishment is a 11 x 9 bromide portrait print of exquisite quality. We must congratulate the firm on the refinement and good taste shown in this attractive card. It is sure to direct popular notice to the Wellington papers, and that without being unduly assertive.

Studio Gossip.

MR. P. R. SALMON, F.R.P.S., has entered into partnership with Mr. R. C. Vansittart of 12A, Lord-street, Liverpool, as stereoscopic view publishers.

PYRO DEVELOPMENT.—*Photographic Scraps* for March draws attention to the fact that in Dr. R. E. Liesegang's paper, *Der Amateur Photograph*, an article is published concerning pyro development which is well worth consideration. After pointing out that pyrogallic acid was the favourite developer with the wet-plate photographer, and was followed by ferrous oxalate, hydroquinone, eikonogen, and the aniline derivatives, the writer alludes to the fact that photographers are returning to pyro, and that this tendency cannot be due to pure conservatism. Dr. Liesegang has often referred to the compound nature of the image formed by pyro development, the negative being composed of metallic silver plus stain. This almost eliminates the risk of over-exposure. On the other hand, pyro is recommended by manufacturers of shutters as the best developer for instantaneous work. These two extremes suggest that pyro is probably the developer giving most latitude.

A SOUVENIR post card in honour of last week's stirring events, has just been issued by Messrs. Raphael Tuck & Sons. Majuba, with its fatal date, February 27, 1881, appears engraved on a broken stone at the top corner of the card, the wording "Paardeberg" with the same date in 1900, and "Ladysmith" with the date of the following day appearing below, while an infantry man in khaki, who has evidently been busy, judging by his broken chin-strap and his general determined martial bearing, is standing on the right, with his rifle leaning against his leg, and in the act of unfixing and sheathing his bayonet. The wording at the side, "Wiping something off the slate," is the key to the significant action. The figure is drawn by Mr. Harry Payne, the painter of the famous picture *Sons of the Empire*. The post card is issued at the price of one penny, so that Messrs. Raphael Tuck & Sons, the publishers, should be able to record an unprecedented demand for this patriotic little souvenir of the "beginning of the end."

WE are sorry to learn of the death of Mr. Thomas Edge, photographer, of Llandudno, which took place on the 26th ult., in his eightieth year. He was at one time a most successful portrait photographer for nearly thirty years in the earlier days, and by some of our older readers will be remembered for his improvements in studio construction and studio lighting, as well as for his method of double printing, with inserted foregrounds and backgrounds, a system frequently described in our pages. In the early days of carbon he was one of the best and most successful workers in that line, and in the early days of platinum he was also a pioneer. During the last few years an almost complete loss of eyesight caused him to give up photography, which he had continued as a hobby even after retiring from it as a business, and he then developed a method of building up various scenes from pieces of cork, lichen, sand, &c., which he could see to do in a good light, and photographing the results. In this way he produced very many fancy pictures.

LAST week a dozen gentlemen sat down at the Camera Club to what was perhaps the most remarkable meal that has been eaten in the country since Frank Buckland dined off jaguar steak. Mr. Henry Stevens, of King-street, Covent Garden, the well-known amateur photographer, some time ago conceived the idea of treating his friends to a luncheon, the distinguishing feature of which should be an emu's egg omelette. Sir Cuthbert Peek presented the egg, and Mr. Stevens successfully carried out his idea. First of all were served kangaroos' tails à l'Australienne and saddle of reindeer, and then followed the great event of the occasion—the opening of the emu's egg in order to hand over its contents, which weighed about 2lb., to the chef of the Camera Club. Amid quip and crank, waxing merrier and merrier, Mr. Stevens, dexterously sawed off one end of the shell, purposing to have the remains mounted in silver as a cup. Various savouries in the shape of crocodiles' eggs, alligator's egg, and even gigantic snails' eggs adorned the sideboard. Mr. Stevens had another surprise in the shape of the finest and most beautifully marked egg of the extinct auk, which has come into his hands.

News and Notes.

WE regret to learn that Mr. C. Smerdon Roe, once well known as a contributor to the principal photographic exhibitions, died at Cambridge last week. He will be best remembered as the producer of *Sedge-gatherers*, a very telling photograph.

A REMARKABLE CAMERA.—A contemporary says that a camera that does it all is the "Helioder" of Herr A. O. Forsterling. It not only exposes a film, but develops the negative on this, and then prints positives on sensitised cards, of which the magazine of the apparatus carries 120.

THE TWENTIETH-CENTURY EXHIBITION.—The entries for the International Photographic Exhibition at Bingley Hall, Birmingham, close on Monday next, March 12. The Manager (Mr. Walter D. Welford, 19, Southampton-buildings, Chancery-lane) will be pleased to send prospectus on receipt of post card.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, March 13, at 66, Russell-square, at eight p.m. "The Illumination of Developing Rooms," by Mr. E. Howard Farmer. During the month of March an Exhibition of Photographs, arranged by the National Photographic Record Survey Association, will be on view daily from ten to four.

TWO ANCIENT BUILDINGS SAVED.—We learn that the Town Council of Southampton has decided, by a majority, to preserve the Undercrofts, a very fine example of Early Fourteenth Century vaulted architecture, which was threatened with destruction for street improvements. Archaeologists will feel rejoiced at this, and so will photographers who take an interest in ancient buildings. Henry the Eighth's Palace, or the most interesting portion of it, in Fleet-street, is also saved from demolition. For years this relic of the past has been used as a hair-cutting saloon. Shades of the past! King Richard's City residence, Crosby Hall, Bishopsgate-street, is still preserved as a restaurant, but it remains as a relic of the past.

PHOTOGRAPHS OF BRITISH PLANTS.—The *Pharmaceutical Journal* states that Mr. J. C. Sherstone exhibited, at a meeting of the Linnean Society, a collection of 700 photographs of British flowering plants, to show what could be accomplished by means of the camera in the direction of botanical illustration. He contended that photography was the only means by which the lines and masses of our flowering plants, as truly characteristic as the less subtle characters by means of which botanists group and arrange plants into orders, genera, and species, could be readily reproduced. He explained the various technical processes and apparatus necessary for successful plant photography, and alluded to the difficulties inseparable from the photography of plants in their natural habitats, &c. His remarks were illustrated by means of lantern slides.

YORKSHIRE PHOTOGRAPHIC UNION.—The Annual Meeting will be held in the large hall of the Grammar School, Bradford, on Saturday, April 7, when the proceedings will be opened by a meat tea at 4.30 p.m., followed by a short business meeting, address by the President, and a *conversazione* and exhibition of prints. It is hoped that there will be a large attendance, and, in view of the early hour at which the gathering opens, that the more distant clubs will be well represented. Contributions of mounted photographs, of an interesting or pictorial character, are invited, and the Committee are particularly desirous for each club in the Union to be efficiently represented. These prints should be sent to the Hon. Secretary (Mr. Ezra Clough) at the Grammar School, Bradford, so as to arrive not later than the Saturday morning on which the meeting takes place, or they may be brought in the afternoon by any members attending. No slides are required. Associates are also invited to bring with them any interesting apparatus they may possess, which, however, must be kept in their own charge during the evening. We are informed that the Union now represents eighteen societies, of about 1500 members in the aggregate.

In his concluding lecture at the Royal Institution on "Modern Astronomy," Professor H. H. Turner, M.A., F.R.S., mentioned the discovery of the minor planet Eros, which, at certain times, was a nearer neighbour to us than Mars. Photography, too, had revealed a new satellite of Saturn, not yet seen with the largest telescopes, and several new comets, while it had increased our accurate knowledge of the thousands of nebulae scattered over the sky, and enabled us to see in them a realisation of Laplace's nebular hypothesis. Finally, speaking of the spectroscope, he described the part it played in the investigation of the chromosphere, and said it bade fair to revolutionise eclipse work, even if it had not already done so. It had first revealed the existence of helium, a substance to which the light of a large percentage of stars seemed due, and which appeared of fundamental importance in the universe. By its aid, too, certain stars had been found to contain oxygen, which at one time seemed as though it were confined to this earth. Again, it had enabled Sir W. Huggins to reach a conclusion as to the distance of nebulae, and to show that the nebula and stars of Orion had the same spectrum, and were presumably composed of the same stuff at the same distance, while it had proved that the term fixed stars was a hopeless misnomer by supplying evidence of motion in the line of sight and of movements of stars round other bright stars or dark companions.

CANTOR LECTURES AT THE SOCIETY OF ARTS.—“The Photography of Colour,” by Mr. E. Sanger Shepherd, forms the subject of four lectures during March. The first lecture was given on Monday last. The following is the complete syllabus of the course: Lecture I., March 5, “The Measurement of Light and Colour” (White light, How light waves travel, Composition of white light, The spectrum, The measurement of lights and shadows, The measurement of colour); Lecture II., March 12, “The Representation of a Coloured Object in a Monochrome Print” (Definition of the problem, Impossibility of representing colour contrasts in monochrome, The representation of colour according to luminosity, The preparation of a test object, colour-sensitive plates, light filters, Progressive orthochromatism); Lecture III., March 19, “The Representation of a Coloured Object in its Natural Colours” (White light, Young’s theory of trichromatic vision, Spectrum colours and colour mixtures, Processes based upon Young’s theory, Light filters for trichromatic photographs, The negative, The preparation of transparent prints in natural colours for the optical lantern); Lecture IV., March 26, “The Application of the Trichromatic Method of Colour Photography to the Printing Press” (Light filters, Suitable plates and negatives, Preparation of the printing surfaces, The half-tone process: its faults and difficulties; Inks, The printing of the three impressions, Colour-printing machinery).

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.—At the Midland Grand Hotel, last week, a meeting was held in support of the objects of the National Photographic Record Association. Among those present to support the President were Major-General Waterhouse, Mr. L. Fletcher (of the Natural History Museum), Dr. H. R. Mill (of the Royal Geographical Society), Mr. Dallmeyer (President of the Royal Photographic Society), and many representatives of a number of photographic societies throughout the country. The report was read by Mr. George Scamell (the Hon. Secretary of the Association), who said they had received 1084 photographic prints, or, with those brought in that day, considerably over 1100, and most of the former have been deposited in the British Museum. The collection comprises the most interesting series by Sir Benjamin Stone of the Houses of Parliament (including fine collection of the portraits of Members), of Windsor Castle, the Tower of London, the distribution of the Maundy money, and other subjects; by other photographers of Elgin Cathedral and the antiquities of the neighbourhood, Irish antiquities, a valuable contribution from Mr. H. T. Maltby, and slum life in the East End of London; from Mr. E. Seame of some old houses in London and studies of street life, &c. A number of photographic societies have associated themselves with the movement, letters asking for information and advice as to starting similar associations have been received from Philadelphia and Mysore, and M. Vidal (President of the Council of the Association Musée des Photographies Documentaires), of Paris, has written suggesting an international exchange of photographed documents. Sir Benjamin Stone congratulated the meeting on the success which had been attained since they last met in the room, and felt assured there would before long be a full recognition in the world of the value of the work they were engaged in. He himself had,

it seemed, recently employed himself in photography aent customs in old villages, amongst them being that survival of an ancient celebration, the horn dance in Staffordshire. The President also dwelt upon the almost infinite wealth of material record photgraphers might work upon, and asked what would we not give for some pictures of Elizabeth’s days, to go back no farther.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—At a meeting of the Executive, held on Tuesday, February 20, 1900, Mr. H. Snowden Ward was reappointed Chairman of the Executive for the present year. The Secretary announced the receipt of a set of slides of Canadian scenery from the Toronto Camera Club for circulation amongst affiliated societies. A Committee was appointed to overhaul and revise the sets of slides already in circulation. It was agreed that the collection of pictures for circulation should be revised annually in time for it to commence its travels on December 1 in each year. On the proposal of the Brixton and Clapham Camera Club, it was agreed that the authors of Affiliation papers should be approached as to their willingness to personally deliver same, and upon what terms. After some discussion, it was decided that the Board of Judges should be revised annually at the first meeting of the Executive in each year; that six should form its number; and that the Board for the present year should be constituted as follows: Messrs. J. A. Hodges, A. Mackie, E. Marriage, J. C. S. Mummary, C. H. Oakden, and W. Thomas. It was arranged to call a meeting of the Executive for March 14 to consider the Rules of the Conference of Judges and the calling of another Conference. At a subsequent meeting of the Executive, held on Wednesday, February 28, 1900, Mr. H. Snowden Ward in the chair, Mr. W. Thomas was appointed a member of the Committee in place of Mr. J. A. Sinclair, resigned. It was decided to approach the various societies with a view to arranging a proper sequence of exhibitions so as to make it practicable for a collection of work to be sent from one exhibition to another without the exhibitor being required to have two and even three sets of his pictures, as is often necessary under the existing system. The Chairman reported that arrangements were about to be made for calling a conference of the Lancashire and Cheshire societies early in April, probably on April 2, at the rooms of the Liverpool Society in Eberle-street, kindly placed at the Committee’s disposal. The offer of a set of slides from the National Photographic Record Association illustrative of its work was accepted with thanks. Mr. W. Thomas was added to the Lantern Slides Revision Committee. The Secretary reported that proofs of the Affiliation Annual would be submitted at the next meeting of the Committee, and that it should be ready for publication early in April.

Commercial Intelligence.

We understand that the business of David Allan, 157, Whitfield-street, Fitzroy-square, W., has recently changed hands, and will in future be devoted to the wholesale branch of the photographic apparatus trade.

The *Daily Mail* of March 3 refers to an enterprising firm in Cornhill having in their window photographs, taken the day before, of the crowd round the Mansion House celebrating the relief of Ladysmith. The enterprising firm referred to was R. & J. Beck (Limited), and the photographs were taken with the Frena.

On the occasion of last week’s national rejoicing at the relief of Ladysmith a striking caligraphic notice occupied a prominent place in the shut-up establishment of Messrs. Human & Co., photographic dealers, St. Nicholas’ buildings, Newcastle. Written in a very large hand was the following: “Lady-smith relieved. So are we” (then followed in smaller letters) “for the rest of the day.”

RE EDWIN WESLEY ROBERTS, photographer, Cardiff.—The public examination of the above-named debtor took place at the Cardiff Bankruptcy Court, on Friday, before Mr. Registrar Cousins. Mr. J. T. Richards appeared for the trustee, and Mr. Lewis Morgan appeared for the debtor. Mr. Roberts said that he had been in business for seventeen years. In 1895 he made a composition with his creditors, chiefly on account of having to meet a bill of sale given to Messrs. Imberschein. He borrowed more money from Mr. S. Andrews, and soon afterwards found himself in difficulties again. Trying to keep up his repayments crippled him. Besides this, he had had an illness, and had incurred a considerable loss in law costs, as his other creditors had pressed him. It was true that his statement of affairs showed a deficit of 750L; but, if his assets could be realised in the ordinary way of business, he could have met his creditors in full. When he borrowed the money from Mr. Andrews, the arrangement was that Mr. Andrews should take all the profits of the business. This was continued for some time, and then they agreed that he should pay 10% a week, which he did for eighteen months. By Mr. Richards: “There was no agreement to that effect in writing. Since Mr. Andrews came into the business all the profits had gone to reduce his debts.” “What do you mean by saying, ‘Since Mr. Andrews came into the business?’” “It was agreed that the business should be formed into a company, and I was to receive two-thirds of the shares as my portion. But Mr. Andrews never carried out the agreement. He said that he must be paid off. I wish I had filed my petition then, because I was in a worse hole afterwards than I was before.” “When was that?” “Last July.” “And what was the capital?” “Five thousand pounds.” “What price were you to be paid for the business?” “It never went further than registration. Mr. Andrews put his foot down, and the matter went no further.” “How much money did you receive on deposit with applications for shares?” “Fifteen shillings.” The examination was closed.

KODAK (LIMITED).—The Directors, in their annual report, state that the business was taken over on November 21, 1898, with the benefit of dividends on the shares of the Eastman Kodak Company as from October 1, 1898. The Company has also had the benefit of the European profits as from January 1, 1898, subject to the payment of certain dividends to the shareholders of the

March 9, 1900]

Eastman Photographic Materials Company (Limited). After payment of these dividends, there remained from both sources a profit to the Company of £41,215*l.* 5*s.* 4*d.* As this formed part of the assets purchased, the Directors are advised that it is not available for dividend purposes. It has therefore been credited to capital account, and applied in reduction of the purchase price. The combined accounts show that the amount standing to the credit of profit and loss, being the total profits of the separate Companies for the period ending December 31, 1899, after deducting an amount written off for goodwill, is £345,778*l.* 9*s.* 6*d.* The separate profit and loss account of Kodak (Limited) exhibits a credit balance of £213,521*l.* 0*s.* 9*d.* In accordance with the wishes of the shareholders, informally expressed at the Statutory Meeting, interim dividends have been paid quarterly on both classes of shares. The full preference dividend has been paid, and interim dividends amounting to ten per cent. have been paid on the ordinary shares. The Directors now recommend the payment of a bonus of five per cent. on the ordinary shares, making for the year a total distribution of fifteen per cent. The following is the proposed application of the profits to December 31, 1899, namely: Dividend of six per cent. on the preference shares amounting to £39,111*l.* 12*s.* 7*d.*; dividend and bonus, equal to fifteen per cent., on the ordinary shares amounting to £150,000*l.*; surplus profit carried forward in Europe, £24,409*l.* 8*s.* 2*d.*; total, £213,521*l.* 0*s.* 9*d.* The surplus profits carried forward in America are £127,436*l.* 17*s.* 5*d.* The business shows satisfactory progress in all departments. New branches have been opened in Brussels, Vienna, and St. Petersburg, and the establishment of other branches is under consideration.

The SANGER SHEPHERD PROCESS OF NATURAL COLOUR PHOTOGRAPHY.—Messrs. Sanger Shepherd & Co., of 5, 6, and 7, Gray's Inn-passage, Red Lion-street, Holborn, W.C., are issuing a pamphlet relating to their method of producing transparencies in natural colours, from which we make the following extracts: "The method of the preparation of the transparencies is very simple. The colour-record negatives of landscapes, portraits, still-life objects, microscopic sections, polariscope objects, &c., are secured by means of a repeating back, which may be attached to any ordinary front-focussing camera. This repeating back is furnished with a set of measured three-colour filters, secured in a frame of the same size as the dark slide. The dark slide takes a plate $8 \times 3\frac{1}{2}$, and the three exposures are secured upon the same plate, a single movement of the dark slide changing both the plate and the colour filter. The impressions from the negatives are printed upon the specially prepared plates and films we supply, one being tinted with our staining solutions to a bluish-green colour (or minus red), another to a pink (or minus green), and the third to a yellow (or minus blue) colour. The three prints are then bound together in superposition to form the finished picture. The following are the prices of the necessary apparatus (it is presumed that the purchaser already possesses an ordinary quarter or half-plate front-focussing camera): No. 1 repeating back for attachment to any quarter or half-plate front-focussing camera, fitted with a set of Sanger Shepherd measured coloured filters for use with the Cadett rapid spectrum plate and one double dark slide, with best ebonite draw-out shutters, taking plates $8 \times 3\frac{1}{2}$ (10×8 plate cut in three), large enough for full-size lantern slides, allowing for the space taken out of $3\frac{1}{2}$ inches square by the binding strips, 4*l.* 10*s.*; safe-light lantern, fitted with safe-light glasses for the rapid spectrum plate, 12*s.* 6*d.*; complete lantern-slide developing and printing outfit, containing all necessary apparatus, trays, special printing frames, clips, plates, films, solutions, and materials for developing the negatives, printing the separate sensation transparencies, and mounting, 4*l.* 4*s.*; total, 9*l.* 6*s.* 6*d.* Cost of materials for each set of three negatives and for each lantern slide: Set of three negatives, one Cadett rapid-spectrum plate, $8 \times 3\frac{1}{2}$, at 4*s.* per dozen, 4*d.*; developer, hypo, and varnish, 1*d.*; total, 5*d.* Lantern slides, one Cadett black-tone lantern plate, at 1*s.* per dozen, 1*d.*; one Sanger Shepherd special film for the pink and yellow prints, $6\frac{1}{2} \times 3\frac{1}{4}$, at 4*s.* 3*d.* per dozen, 4*d.*; sensitiser, staining solutions, varnish, cover glass, and binders, 2*d.* 2*s.*; total, 8*d.*"

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
12.....	Bradford Photo. Society	Transparency Making. Frank Nicholson. Description of the Tella Camera, with Illustrations. Mr. Dunmore.
12.....	Glasgow and West of Scotland	Prize Slides.
12.....	Isle of Thanet	A Holiday Tour in Norway. John F. East. Demonstration: Bromide Printing. W. H. Trigg.
12.....	Kingston-on-Thames	The Elan Valley, Site of the New Birmingham Waterworks Scheme. J. H. Pickard.
12.....	Southampton	Printing in Clouds. W. Rawlings.—Manipulating the Negative. S. C. Stearn.
13.....	Birmingham Photo. Society	Annual Lantern Exhibition of Members' Work.
13.....	Hackney	The Illumination of Developing Rooms. Howard Farmer.
13.....	Leeds Photo. Society	Paper by W. R. Stretton.
13.....	Royal Photographic Society	(The Khaki Lantern Show and Entertainment.
14.....	Borough Polytechnic	Photographic Club
14.....	Croydon Camera Club	Members' Open Night.
14.....	Photographic Club	Demonstration of Film Photography. Secco Film Company.
14.....	Southsea	Slides.
14.....	Tunbridge Wells	Annual Meeting of Members.
15.....	Ashton-under-Lyne	Portraiture. Harold Baker.
15.....	Leigh	Demonstration: Cotype. Harry Wade.
15.....	Liverpool Amateur	Paper by Ernest Human.
15.....	London and Provincial	Rambles in North Wales. W. Schofield.
15.....	Oldham	Practical Evening: Enlarged Negatives.
16.....	Borough Polytechnic	Demonstration: Toning of Bromide Prints. A. P. Hoole.
16.....	Croydon Microscopical	Lantern Meeting: Holiday Rambles. W. A. Brown.
16.....	West London	

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 6.—Lantern Meeting.—Mr. J. J. Vezey in the chair.

Mr. J. A. Hodges (the newly appointed Hon. Secretary of the Society) delivered a lantern lecture on

SOME BEAUTY SPOTS OF BRITISH SCENERY,

which he illustrated by a large series of slides from his own negatives of views in England, Scotland, and Wales. Mr. Hodges is so well known as an expert in the making of lantern slides that it is needless to say that the photographs shown were of a uniformly high order of excellence. He explained that they did not profess to belong to that class which calls itself "artistic," but were, as he maintained lantern slides should always be, as sharp as the lens would make them, his main idea having been to convey, as truthfully as the means at his disposal would admit, a realistic impression of the scenery depicted. The first series of views were of the Western Highlands of Scotland, including Loch Lomond, Loch Katrine, the River Teith, Callander, and the Trossachs, the small but very beautiful Loch Achray, and some of the delightfully varied and picturesque scenery of Arran. These were followed by a set of pictures of North Wales, commencing with Llangollen, and then coming down to Dolgellau, and from thence to the incomparable estuary of the Mawddach, with Aberamffra Harbour, Tyraumawr, the precipitous shoulder of Cadair Idris, and the Arthog marshes. Next, with Bettws-y-Coed as headquarters, the rivers Llugwy and Conway were illustrated, with the Fairy Glen and the Swallow Falls, the Lledr Valley and Pontypant, and several fine interiors of the old Elizabethan mansion called Plas Mawr. The first of the English views represented some of the most beautiful and interesting parts of Devon and Somerset, starting with the Guildhall and Cathedral at Exeter, and then going to Dartmouth, Chagford and Chudleigh in the south, and Dunster, Holnicote, Horner, Lynmouth, Rockford, and Clovelly in the north; and the concluding series depicted the scenery of the English Lake District—Furness Abbey, Ambleside, Thirlmere, Grasmere, Rydal Water, Windermere, Borrowdale, and Wastwater. As usual at the Lantern Meetings at the Royal, there was a large audience, who evidently appreciated the beautiful views which Mr. Hodges had collected in our own country.

COMING EVENTS.

March 13, Ordinary Meeting, "The Illumination of Developing Rooms," by Mr. Howard Farmer. March 20, Photo-mechanical Meeting, a demonstration of the Heliogravure Process, by Mr. Ignatz Herbst. March 27, Technical Meeting, "Some Developers Compared," by Mr. Alfred Watkins. April 3, "Slides Old and New" (Lantern Lecture), by Mr. F. P. Cembrano. During the month of March, and part of April, a collection of photographs, arranged by the National Photographic Record Association, will be exhibited at the Society's house, 66, Russell-square, the Exhibition being open daily, from ten to four o'clock.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 1.—Mr. E. Human in the chair.

A member passed round some prints which he had toned with copper according to Mr. W. B. Ferguson's method. Some of the prints were upon ordinary bromide paper, and with these he had no difficulty, but one of the photographs, which was printed on Velox paper, remained quite unaltered until it was treated with a solution of bromide of potassium and transferred thence direct to the copper bath, when no further difficulty was encountered.

Some discussion took place regarding the intensifying and reducing effects produced by different copper baths.

It was stated that Mr. John Sterry had shown that by Mr. Ferguson's method a negative was positively reduced, to all appearance intensified, that is to say, that, although visually the contrast was more marked, the images were thinner and printed quicker. If the ammonium carbonate form of the copper bath were used, there was a distinct intensification, and, by going further, and printing under green glass, a still farther degree of intensification was the result.

Mr. BECKETT, replying to an observation that continued washing of copper-toned prints took away much of the redness resulting from the use of the bath, said that he had not noticed anything of the kind. He expressed the hope that the subject brought forward by Mr. Ferguson's paper at the Royal Photographic Society would receive every attention by the members of the Association.

Richmond Camera Club.—On February 26, Mr. Smith, of the Platinotype Company, gave a demonstration of the process. Many very beautiful prints (some of which were from negatives lent by Mr. Sandell) were developed, and Mr. Smith showed the effect of mixing glycerine with the developer very effectively by developing some large prints supported on a tray by means of brushing the developer over them. He also showed the development of the sepia paper, which requires a hot bath; and the tone produced, as exemplified by some finished prints, was much admired. Mr. Cembrano, who was in the chair, moved a very hearty vote of thanks to Mr. Smith and the Platinotype Company, and took advantage of the opportunity to speak in very favourable terms of the process, which he described as one of the simplest and most satisfactory of them all.

Liverpool Amateur Photographic Association.—The general rejoicings militated greatly against the attendance, but those who were present had a thorough treat. The lecturer was Mr. J. W. Wade, Manchester, who took for his subject

AN ALPINE BORDERLAND.

Mr. Wade's description of a tour through Belgium to the Lake of Lucerne was very fine, and his pictures were of the highest order. Many of the slides called forth enthusiastic applause, notably one or two done by the carbon process.

Longton and District Photographic Society.—March 1.—The President (Dr. Parkes) occupied the chair, and there was a good attendance of members.

The HON. TREASURER (Mr. S. Ashcroft) presented the accounts, which showed a balance of about £2. to the credit of the Society. The HON. SECRETARY (Mr. T. Mottershead) submitted the sixth annual report of the Committee, which stated that the past year had been the most eventful one in the Society's history. Satisfaction was expressed that the Society was now recognised by the Town Council as a valuable factor for good in the town by the granting of rooms in the Sutherland Institute in which to hold their meetings. The attendance at the meetings during the year had been fully maintained. A special feature in the proceedings was the presentation to Mr. Mottershead of a handsome marble timepiece, with bronze ornaments to match, subscribed by the members of the Society in recognition of his valuable services as Hon. Secretary. Mr. ASHCROFT said it had been unanimously felt that one who had devoted himself so heartily and so successfully towards the interests of the Society should receive some token of their appreciation of his services. Councillor C. S. MEIGH bore testimony to the ready aid which their Secretary was at all times willing to give to new beginners. The PRESIDENT made the formal presentation in terms of cordial congratulation, and Mr. MOTTERSHEAD, in expressing his acknowledgments, said it had been one of the greatest pleasures of his life to be of any service to the Society, and he should always value their handsome present, which would always be treasured by his family. The following officers were elected:—President: Dr. A. Parkes.—Vice-Presidents: Messrs. E. Hallam and W. T. Lucas.—Hon. Vice-President: Mr. E. Haigh, M.A., B.Sc., &c.—Committee: Messrs. A. W. Allin, W. Bates, G. V. Myatt, J. Bold, J. T. Mountford, S. Jackson, and C. S. Meigh.—Auditor: Mr. A. Shenton.—Treasurer: Mr. S. Ashcroft.—Secretary: Mr. Thomas Mottershead.

Newcastle-on-Tyne and Northern Counties Photographic Association.—At the last meeting of this Association Secco films were demonstrated, and a very favourable impression of the material was made upon the members present. When the English factory of the Company is completed and their operations fairly commenced, it is a certainty that the new film will have a host of advocates. Its development is the same as for ordinary plates with the slight difference of a short preliminary glycerine bath. After fixing and washing they are again placed in the same glycerine bath in company with a piece of support (supplied with the films) withdrawn and lightly squeezed. After being allowed to dry, both the paper backing of the original film and the paper backing of the support are very easily stripped off, leaving the emulsion film protected on both sides by a special coating of Secco film, which renders the whole composite film perfectly waterproof. The finished film is beautifully flexible, having the feel of a piece of silk. Its strength and flexibility were shown in a remarkable manner by the demonstrator crumpling a large negative into a ball, after which he flattened it out again, and showed that it was not in the slightest degree injured. The film is so thin that it can be printed from either side without the slightest loss of definition, and a great point in its favour is that it is a thoroughly reliable cure for halation, not a trace of that trouble being visible in any of the numerous negatives shown, although several of them were of very difficult subjects.

FORTHCOMING EXHIBITIONS.

1900.

- March 9, 10 South London Photographic Society. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh Hill, Blackheath, S.E.
- „ 13, 14 G.E.R. Mechanics Institution (Photographic Section). C. W. Harris, 294, Cam Hall-road, Leytonstone, E.
- „ 26 Twentieth Century International, Birmingham. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.
- „ 26-31 Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin.
- April 3-7 Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between February 19 and February 24, 1900:—

DAYLIGHT CARTRIDGES.—No. 3299. "Improvements in Daylight-loading Photographic Film Rolls." J. E. THORNTON.

WASHING MACHINES.—No. 3382. "Improved Machine for Washing Photographic Negatives." Communicated by J. H. Smith. Complete specification. R. W. JAMES.

PROJECTION APPARATUS.—No. 3402. "Improved Means for the Projection of Cinematographic Films upon a Transparent Screen." A. DALLIET.

SHUTTERS.—No. 3476. "Improvements in Photographic Roller-blind Shutters." J. E. THORNTON.

BACKING PLATES.—No. 3605. "Improved Protecting Paint for Photographic Plates, Films, and the like, for Preventing the Formation of Halos ('Solarisation')." P. PLAGWITZ and F. FREUND.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

TYLAR'S "TIT-BIT" HANDICAP FOR THE A.M.B. FUND.

(The twelve "Tit-Bit" Cameras realised over 30!.)

To the Editors.

GENTLEMEN,—I have great pleasure in informing those people who so kindly subscribed to the above fund that 605 tickets have been sold, hence I am able to send out to Dr. Hall-Edwards photographic appliances to the value of that amount.

The following gentlemen have acted on the Committee to see that the drawing was carried through in a proper manner:—

Dr. Hill Norris, J.P., President of the Aston Photographic Society.

F. Pilditch, Esq., Vice-President

Councillor Sydney Fisher, J. W. Salt, Esq., P. H. Morris, Esq.

This took place at my offices, 41, High-street, Aston, Birmingham, in the afternoon of March 1, 1900, the winning numbers being drawn by my youngest son, aged five.

The following are the fortunate recipients of the twelve "Tit-Bit" Hand Cameras, which have been duly posted to them:—

- No. 64. Mr. G. W. Lindsay, 57, Crofton-road, London, S.E.
- 72. Mr. G. F. Jones, Quarry Bank, Malton, Yorkshire.
- 75. Mrs. Knight, Nine Ashes, Blackmoor Green.
- 83. Mr. Beilby, Ivy House, Roundhay, Leeds.
- 104. Mr. Miller, 19, Richmond-place, Brighton.
- 222. Mr. Cross, Bootmaker, Flamborough, Bridlington.
- 272. Mr. H. Nicholson, photographer, West-street, Fleetwood.
- 278. Mr. Baird, Broughty Ferry, N.B.
- 430. Nurse Barnes, Samaritan's House, Bow-lane, Durham.
- 502. Mr. H. J. Stevens, 13, Gillies-st., Kentish Town, London.
- 540. Mr. Fairbank, Clydesdale House, Hessle-road, Hull.
- 590. Mr. J. S. Daniels, Fern Cottage, Lightfield, Stroud, Glos.

I shall send out to Dr. Hall-Edwards the most suitable requisites I can think of, and which, I am sure, will be gratefully acknowledged in due course.

I sincerely thank the photographic friends for the hearty manner in which they have co-operated with me in this object.

I also thank Mr. Ladbrook, printer, High-street, Bordesley, Birmingham, for supplying the printed matter free of cost, and THE BRITISH JOURNAL OF PHOTOGRAPHY, Photo News, Photography, Amateur Photographer, and the Optician, for giving publicity to my offer.

I also tender my thanks to Messrs. Lennon & Co., 75, Leadenhall-street, London, who have undertaken to deliver the goods free of charge to Dr. Hall-Edwards; and to Mr. Kent, optician, 35 High-street, Staines, London, W., who has promised to send me twelve pairs of field glasses to be sent out for free distribution as Dr. Hall-Edwards deems fit.

In conclusion, I would mention that I am having a plate engraved for a beautiful stereo camera, among the articles sent out, with an inscription commemorating the event as presented on behalf of over 600 photographers.—I am, yours, &c.,

W. TYLAR.

NEGATIVES BY POST.

To the Editors.

GENTLEMEN,—As you published a letter respecting enclosed, in which the writer suggested that some prints were never sent, I beg, in justification to myself, to enclose a notice just received from the Post Office.

Your remark as to there being twenty photographers here was hardly reasonable. I am the only trade photographer of this town advertising in JOURNAL, and, as your correspondent mentioned negatives and prints, it was clear enough he referred to a trade photographer, hence my theory that those who troubled to notice the letter would associate me with it; indeed, it was the fact that I heard of it from two or three quarters that prompted me to reply. Of course, the matter is all over now, I merely send this because I don't wish to have any misunderstanding on matters of this kind with the editor of the principal journal.

I can assure you the lot of a trade enlarger is not altogether a happy one. I have no end of work thrown upon my hands by persons "who require work urgently, and will forward cash on receipt of invoice," on the chance of getting it for nothing. I generally hold back negatives of these gentry, and am consequently frequently threatened with "letters to the Editor."—I am, yours, &c.,

HENRY WARD.

[COPY.]

General Post Office, London, March 2, 1900.

SIR,—I am directed by the Postmaster General to inform you that the photo missing from the parcel addressed to Mr. F. G. Willatt, referred to in your application of the 8th ult., reached the Returned Letter Office, having been found loose in the post, and has since been forwarded to its destination.

I am Sir, your obedient Servant,

G. H. MURRAY, Secretary.

COLOUR PHOTOGRAPHY ON LANTERN SLIDES.

To the Editors.

GENTLEMEN,—I send three lantern slides, as I proposed. They are scenes off the beaten track in the Rocky Mountains and British Columbia. I believe them to be the first specimens of colour photography (date 1889) fairly produced. Having, as I thought at the time, overcome the difficulty, I gave the work up for other subjects.—I am, yours, &c.

West Lodge, Galway, March 2, 1900.

W. R. O'HARA (Lieut.-Col.).

[Colonel O'Hara sends us three lantern slides. Two of the subjects are river and mountain views, with trees in the foreground and middle-distance; in the third, there are trees in the foreground and mountains in the distance. In the first two, the trees and their reflections show in shades of green, and the clouds of one are faintly blue; in the third the trees are coloured green, and there is a bluish tint in the other parts of the transparency. We have no particulars as to how these effects have been produced; they present the appearance of chemical agency having been at work. The green and blue colours are in no way comparable to the brilliant spectrum rays seen in the physical colour transparencies of Wood, Ives, and Joly, or the interference positive images of Lippmann. Will Colonel O'Hara oblige us with details as to how the tints in his lantern slides were produced? We return the transparencies with thanks.—EDS.]

BACKING PLATES.

To the Editors.

GENTLEMEN,—As the result of experiment, I have come to the conclusion that one of the best things to use as a backing for plates to prevent halation is the dull red paper, often used in the packing of plates, &c., applied with paste, and brought into optical contact by means of a roller squeegee; it is cheap, not messy, easily applied and easily removed; in fact, if, after pouring on the developer, the plate is lifted in the dish to allow the liquid to run under it, the paper will be ready to strip off by the time the development is well advanced. As a test I enclose print from the negative of the chancel of our church taken on a special rapid plate thus backed, and you will see that, while sufficient exposure was given to bring out the outlines of the dark oak roof timbers, the detail of the east window, two-thirds of which is clear glass, was thoroughly protected. What do you think of it? It is necessary to thoroughly damp the paper before applying the paste, otherwise the paper may cockle after squeegeeing, and optical contact be lost.—I am, yours, &c., T. STOKOE.

Clare, Suffolk, March 1, 1900.

[There is no halation apparent in the print kindly sent us by Mr. Stokoe.—EDS.]

APATHY OF BRITISH HAND-CAMERA MANUFACTURERS.

To the Editors.

GENTLEMEN,—With reference to your correspondent's letter in the last issue of your JOURNAL, in which he complains of the difficulty of obtaining from English camera manufacturers a reflect camera such as he describes, I may say that I have had a somewhat similar experience. Like "A. G. B." I have been desirous of obtaining a reflect hand camera of the box pattern. I have approached several of the leading camera manufacturers with the following specification: 5 x 4 camera, box pattern, reflect system, reversing back, full size finder (giving the picture both ways of the plate), focussing arrangement, camera to be built to take a 7½-inch focus lens, and to be fitted with a really efficient shutter (focal plane preferably), capable of giving exposures as long as one-tenth of a second.

In every instance I was informed that they (the camera manufacturers) could not undertake to build such a camera. A camera of this description for snap-shot work, pure and simple, would, in my opinion, be an ideal one. Apparently camera makers think otherwise.

It may interest "A. G. B." to know that a reflect hand camera has recently been placed on the market, having a bellows extension of fourteen inches, and fitted with a really good focal plane shutter; but as the size of this camera is very little less than a twin lens, and as the price is somewhat excessive (15/- 15s. for 5 x 4 camera and three D.D. slides, without lens), I doubt whether it would suit him.

Like "A. G. B." I have come to the conclusion that I shall have to make known my requirements to an American firm, whose enterprise and reasonable charges I have taken advantage of on previous occasions.—I am, yours, &c.,

March 2, 1900.

ORTOL.

To the Editors.

GENTLEMEN,—A few months back an article appeared in the JOURNAL, by Mr. Welford, advocating the new developer ortol, and at intervals since I have noticed letters (some of them more or less frivolous) for and

against this reagent, the last one from a correspondent in India, appearing in your issue of the 2nd inst. Will you kindly grant me space to give my experiences of ortol? I first tried the stuff in Ceylon, a place that will try anything. On opening the bottle I found the contents perfectly good, nothing slate-coloured or sooty-grey about it. There was no difficulty in making up a solution as per instructions. No scum or sediment, but a straw-coloured solution, same as I have since got here in England. The negatives developed with that first solution printed remarkably well. I brought it under the notice of some expert amateurs, and I know that, at least in a few cases, it was adopted in preference to anything else, not excepting pyro, one of the best of them declaring that "he was delighted to have at last found a developer giving results equal to pyro without pyro's drawbacks."

I have given it a fresh trial lately, and I must say I consider it in advance of any of the other new (compared with pyro) developers. The formula is simple, and prints from negatives made by it are excellent. Its action is more like that of a properly constituted pyro developer than any of the others. The image appears in a reasonable time, and is completed in a reasonable time, and plate after plate can be developed in the same solution as long as there is enough to cover, and the last plate is just as good as the first—no hungry shadows, no chalky highlights. I advise the use of the formula, given with the bottle, omitting the hypo. Best results seem obtainable with the minimum of bromide, and the temperature should be constant.

I am a professional, and, of course, pyro and (I may add) ammonia is my sheet anchor; not from choice, but because nothing else is quite as good; but I am not silly enough to ignore another good thing when I find it, and ortol is a good thing.—I am, yours, &c.,

LONDON, March 5, 1900.

LAUKA.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

J. Robb, 164, Springfield-road, Glasgow.—Three photographs of Ruthill Hospital, Glasgow.

P. H.—You probably mean a camera lucida. Inquire of a dealer in optical instruments.

R. C. TURNER.—We would suggest application to Messrs. Newton & Co., 3, Fleet-street, or Messrs. J. H. Steward, Strand, London.

L.T. MOUNTED RIFLES (India).—We are very much obliged to you for your letter, but it does not possess any photographic interest, so that we cannot publish it. Besides, you omitted your name and address, an infringement of a well-recognised rule.

DEVELOPERS.—T. S. M. W. says: "1. Which do you consider the best developer for snap-shots, not counting pyro or metol? 2. Does the use of ortol occasion any irritation to the skin such as is caused by metol?"—In reply: 1. Ortol would probably be considered by many to have the preference. 2. We have not heard of any such cases.

RESIDUES.—W. CRAMER asks for a simple method of getting the silver out of the hypo bath. He says he has tried zinc, and that does not work well in his hands. The best way is to precipitate the silver as sulphide by the addition of sulphide of potassium—liver of sulphur as it is sometimes called. Add a solution of that till all the silver is thrown down.

AN APPRENTICESHIP QUESTION.—ABBIEY asks: "Is there any law by which a master can stop an apprentice from selling prints from an enlarged negative made from his own original?"—In reply: We know of no such law; but, without seeing the indentures, we cannot say if the apprentice in this particular case is permitted to sell the prints. Probably not. We do not reply through the post.

COPYRIGHT.—T. E. I. asks: "If I copyright a whole-plate view, will the same photograph reproduced on a post card (smaller of course) be protected? or, if I copyright the reproduction, will the whole-plate be protected?"—In reply: In the first case, the reproduction will enjoy the same protection as the original; but we imagine the same conditions would not hold in the second, inasmuch as the Act stipulates for the registration of the original photograph.

SILVER STAINS.—JAKEMAN & CARVER write: "Can you inform us how to treat silver stains on a negative, produced by getting wet while printing?"—In reply: Many remedies have been suggested. To treat the negative with alcoholic solution of iodine followed by solution of cyanide of potassium is an old method. The cyanide solution is sometimes used alone. Messrs. Marion, of Soho-square, sell a mixture, by Mr. H. N. King, which has been found to answer well in bad cases of stains.

DISCOLOURED NITRATE OF SILVER.—A. M'INTIRE writes: "I have five or six ounces of nitrate of silver that has laid (in a bottle) in a cupboard for several years. The crystals are a dark grey on the outside, though they are white inside when broken. Will the nitrate in this state do for sensitising albumen paper? if not, can you kindly tell me how to purify it?"—The nitrate will do quite well as it is. Simply dissolve it in water and filter. It will be found quite as good as if just crystallised.

COPYING SAME SIZE.—T. A. C. says: "I want to copy some photographs the same size as they are, but I cannot get them sharp. I can get them sharp enough when they are about two-thirds the size, but, when I put the camera nearer to get them the full size, I cannot get the image sharp. Why is that?"—Simply because the camera has not a sufficiently long extension. You must either use a shorter-focus lens or a camera with a longer extension. The camera must be double the focal length of the lens to copy same size.

ALBUMEN SUBSTRATUM.—S. BOWERS says: "How is the albumen substratum used in the collodion process made? and will it keep good for, say, a week or two, or must it be used freshly made?"—Take the white of an egg and, after separating the germ, put it into a Winchester quart bottle half filled with water. Add a few drops of ammonia, and well shake for a few minutes, then filter through blotting-paper. With the ammonia it will keep good for two or three weeks. After keeping for a time it may require to be refiltered.

STEAMING OF SHOW-CASE.—W. R. & G. write: "Can you tell us how to prevent the steaming of our show-cases? When they get warm with the sun the inside of the glass gets covered with steam and the pictures can hardly be seen."—This is due to moisture within the case, and, when it gets heated, it condenses as dew on the glass. It may be obviated by having ventilating holes in the case, so that the moisture can escape. Another way is to make the case completely air-tight, taking care, before sealing it up, that the mounts and pictures are thoroughly dry.

SALE OF COPYRIGHT NEGATIVES.—S. W. says: "I am in treaty for the purchase of a business with, of course, the negatives, a considerable number of which are copyright, indeed they are an important item in the purchase. Will the copyright in these be legally mine, supposing I were to pay a distinct price for them, and take a separate receipt for them?"—No. To acquire a legal copyright in them, the copyright in each negative must be separately assigned to you. If that is not done, the copyright still remains with the author of the work, though the negatives will be your property.

WEIGHT OF NITRATE OF SILVER.—CHEATED writes: "I bought 4 ounces of nitrate of silver, and used 4 drachms of it for a bath, then I weighed out another 4 drachms, and so on, and, after weighing the seventh lot, I found there was only a little more than a drachm left, so that I was defrauded out of nearly 3 drachms in the 4 ounces, a considerable item with such a costly thing as nitrate of silver. Ought not this sort of thing to be exposed?"—Hold, good friend, you have not been defrauded at all. You are, perhaps, not aware that nitrate of silver, like other things, is sold by avoirdupois weight, 437½ grains to the ounce, and you have been using it by apothecary's weight, 480 grains to the ounce.

STUDIO WORK.—ARTIFICIAL LIGHTING says: "I am thinking of taking a private house as a photographic business, but cannot get plans passed for erecting a studio. Now, as this is the only house available, and in an excellent position for the purpose, am anxious to see if I cannot use a room for studio (there is one suitable) with the means of artificial lighting. What could you recommend for lighting purposes, no light to speak of from window and no electricity laid on? Would the Platinotype Company's lamp answer my purposes for groups," &c. ?—In reply: The lamp named would answer our correspondent's purpose. It is worked by means of a battery. See the description of it which we gave on February 9.

STUDIO-BUILDING.—P. R. O. says, "Will you kindly express your opinion of the design and size of the enclosed sketches of studio I propose building? The sketches are not to scale, but I have marked the dimensions on them, which I hope you will be able to make out. The studio will be for professional work. You see, I only propose to make it twenty-five feet long, but I can get it thirty feet if you think it advisable, though I should like to save the extra cost, unless there would be a corresponding advantage."—The design of the studio could not be well improved upon. We should, however, recommend you to have the thirty feet; the extra length will be a great convenience at times, as in taking groups. It will also enable lenses of longer foci to be employed, so that more pleasing perspective in the picture will be obtained.

COLOUR PHOTOGRAPHY.—INQUISITIVE writes: "I take deep interest in tri-colour photography, and I also read all matters of your JOURNAL concerning same. In THE LANTERN RECORD of your last number, March 2, I see Captain Lascelles Davidson's and Colonel Osborne Pollock's, three-colour cameras are patented, Nos. 3560 and 14,364, and I make free to put you one question respecting these inventions. When three-colour negatives are taken with these cameras and positives printed therefrom, how can it be managed to have perfect superposition or register of the three images, as the angles from which every one of them is taken are slightly different? It is undoubtedly very desirable to have simultaneous exposure for red, blue, and green rays, so as to shorten the time; but this should be done only for as much as it should not be of any damage to the image; and, doubtless, the inventors have found a way to proceed."—In reply: We fear that neither of the cameras named would be of the greatest advantage in practical three-colour work, for the reason given by our correspondent, viz., that exact superposition of the three images would not be obtained. It is conceivable that the patentees overlooked this point.

ENLARGING ON VELOX PAPER.—B. PIPER writes: "Is it possible to make enlargements on Velox paper, as I like the colour it yields better than the ordinary bromide. I have an enlarging lantern with good three-wick lamp. I have tried, first with ten minutes' exposure then half an hour, and, last night, with three-quarters of an hour exposure, but with no success."—We are not surprised, as the paper is too slow for enlarging upon. When it is considered that the paper is sufficiently insensitive to be manipulated in ordinary gaslight, it will be obvious that it is quite unsuited for enlarging upon—with the three-wick paraffin light.

BACKGROUNDS, &c.—S. A. S. would like to know the cheapest and most simple method of making and painting a studio background, and what materials to use, also how to fix P.O.P. paper on opaline glasses.—We presume a plain background is meant. The simplest way to make that is to stain unbleached sheeting on a wooden frame, and then give it a good coating of Young's patent size, to be had at the oilshops, and allow to dry. Next mix together whiting, drop black, and water to the tint desired, and then add, hot, sufficient of the size to form a thin, tremulous jelly when cold. Apply with a whitewash brush, *cold*, working the colour evenly all over. 2. Clean the glass thoroughly, and, when the prints are taken out of the washing water, squeegee them on to the plates. The prints should not be alumbed.

CAMERA, VIGNETTES, &c.—HARTLEPOOL says: "I have had two cabinet photographs sent me that were taken in America. They are of ladies taken in evening dress in front of darkish background. 1. From the bust it goes direct into background, and is, what I think, termed a camera vignette. I am experimenting, but, if you can give me a useful hint, would be extremely obliged. 2. I do a fair amount of X-ray work, and, being deeply interested in my work, I like to keep up to date. There is, I think, a Röntgen Society. What to do to become a member, please?"—1. Without seeing an example we cannot definitely say how it was produced. Cannot you send us one? Vignettes can be made in the camera by placing a black mask, with a serrated opening, some distance in front of the lens, keeping it moving backward and forward during the exposure, so as to soften the effect. You will then get the figure vignetted into clear glass. 2. Write to the Hon. Secretary of the Society, 12, Sinclair Gardens, West Kensington Park, W.

STUDIO - BUILDING. — EX UNO DISCE OMNES says: "May I trouble you with the following questions respecting a studio without any slanting skylight at all, as first proposed, I think, by Mr. H. P. Robinson? My present studio has a direct south light and comparatively flat roof, which roof I wish to alter to the enclosed plan, should it meet with your approval at all. First, Do you think the height would be sufficient for top light, taking into consideration reflection from the roof? second, and the length of glass sufficient to light the shadow side enough, as ten feet wide does not allow of diagonally working. May I say that I am not devoid of the knowledge of lighting in some degree, and the blinds being upright would be far more manageable than at present?"—We should prefer, ourselves, to have some slope to the light, say to one-third of the width of the studio. The length of the glass will be ample to enable the shadow side of sitter to be illuminated. However, the studio, as proposed, will enable excellent portraits to be secured with a little skill on the part of the artist.

SPOTS ON PRINTS.—COLLO says: "I would feel much obliged if you will give me your opinion as to the cause of the spots on the enclosed prints; they have made their appearance after the prints have been mounted a week. I have also had some platinum toned go the same way. The mounts are supposed to be faced with Whatman's paper; what is your opinion? I may add that I have been working this same brand of paper for years, and have never had any trouble whatever; and these have been produced in my ordinary way of working. Thanking you in anticipation."—In reply: The mounts appear to be perfectly pure, and the spots only show on the surface of the image. Although, apparently, so simple, nothing could be more difficult to answer than such a question. We can only say that the spots are, in all probability, caused by the presence in the washing, toning, or fixing solutions of some chemical body which had no business there. The best advice we can give our correspondent is to make up fresh solutions, and see that all his operations are conducted in the cleanest surroundings, and the spots, in all probability, will not recur.

SATURATORS.—A WEST-COUNTRY LANTERNIST writes: "For some time past I have been dissatisfied with the ordinary blow-through jet for lantern work, and am anxious to have the advice of friendly experts as to the best thing to obtain for use in this far end of the country. The lime-light is simple enough when near the town gas and a cylinder of compressed oxygen; but, when away from gas mains and a good light is wanted for lighting up tableaux, &c., then the difficulty begins. The two gases under pressure is not always convenient, besides being expensive. I have not looked with favour upon ether saturators, but now I am inclined to try them. Are they safe? What kind would you recommend? What is the best kind of jet to use with them? Is there any gain in light over the blow-through or mixed jet?"—In reply: Saturators are perfectly safe. In his excellent book on optical projection, Mr. Andrew Pringle remarks: "Of late years, very much more attention has been turned to saturators, with the result that perfect control of action, absolute safety, and an efficiency at least equal to mixed gases under the best conditions, has been attained." The Pendant saturator, manufactured by Messrs. Willway & Sons, Bristol, works outside the lantern, can be used with any mixing jet, or with Gwyer's jet, manufactured by the same firm. Our correspondent might find this saturator meet his requirements.

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EX CATHEDRÂ.

In the *Daily Chronicle* of last Monday an article by Mr. G. Herbert Thring (Secretary of the Society of Authors) discussed the principal provisions of Lord Monkswell's Literary Copyright Bill, which is shortly to come before the House of Lords. With the exception of one clause relating to registration ("a most unsatisfactory method of obtaining copyright," as Mr. Thring characterises it) our authority is in favour of the proposed Bill. He says, in fact, that it deserves the support of all interested directly or indirectly in copyright property. It increases that property to its owner, it gives larger powers of dealing with it, and puts into one comprehensive Bill what is at present contained in disjointed and isolated Acts—Acts that in many points won't read with one another, whose draughting is often incomprehensible, whose language is involved. All the existing difficulties are here cleared away, and, though perhaps the Bill does not go far enough, yet as far as it goes it deals with the subject with method, clearness, and regularity. It has the support of the Incorporated Society of Authors and of the publishers. It only remains for it to obtain that of the House of Commons.

MR. THRING is the representative of one of the two societies the Copyright Association and the Society of Authors, which prepared copyright bills two or three years ago, but withdrew them in favour of one drawn up by that eminent Parliamentary lawyer, Lord Thring. It is the latter Bill of which Lord Monkswell has also charge, and that has elicited such high and almost unqualified praise from Mr. Thring. The contrast between the attitude of the literary men towards the Copyright Bill affecting their interests, and that of photographers towards the Scruton-Bale-Royal-Academy attack on photographic copyright is wonderfully instructive. By the hand of Mr. Thring, their representative, the authors signify their approval of a measure which that gentleman declares "clears away all existing difficulties" in literary copyright. Vast interests, commercial as well as purely literary and journalistic, are touched by the Bill, which appears to have been so admirably cast that it has provoked little or no opposition from those on whose behalf it is presented to Parliament. Perhaps this need not be greatly wondered at, seeing that societies representative of literary men were consulted in the preparation of the Bill, the chief provisions of which were not jealously concealed from those most affected by them.

* * * *

FAR different stands the case with the publishers and painters who have united to attack photographic copyright. Not a single photographer was consulted in the drawing up of the notorious St. John's Wood Bill of spoliation and degradation. Throughout the length and breadth of the land not one person directly interested in photography has been found to give that measure a word of support. Last year, before the Select Committee, voluminous evidence was tendered against it; at the Royal Photographic Society, the Copyright Union, and many other meetings, the Bill has been strongly attacked and criticised; and there is absolutely no one in a position officially analogous to that occupied by Mr. Herbert Thring at the Authors' Society, to come forward and say a word in favour of the photographic clauses of Lord Monkswell's Artistic Copyright Bill. Yet, in face of the stern and unflinching opposition of those most affected by that measure, Mr. Bale, Mr. Scruton, Mr. John Leighton, Mr. Alfred East, and other friends of the painters and sculptors, take up an evening at the Society of

Arts, calmly pooh-poohing the natural objections of photographers to having their copyright interests disturbed by a handful of publishers and painters.

* * *

WE trust that, when the La Belle Sauvage-cum-St. John's Wood Bill for menacing photographic copyright interests comes before Parliament, it will not escape the notice of some friends of photography in both Houses. We are sure that, if he is in his place in the Lords, Lord Crawford, with his keen sympathy for the bread-and-butter side of photography, will not allow the Bill to pass without pointing out the harm it proposes to inflict upon a none too prosperous profession. In the House of Commons Sir J. Benjamin Stone would find at hand a splendid opportunity for manifesting his keen interest in photography by opposing those portions of the Bill which attacked photographic copyright. Mr. Scrutton, at the Society of Arts last month, said the only people satisfied with the Bill were the Royal Academy and the painters and sculptors. The learned gentleman added: "It had to go before a tribunal of country gentlemen . . . and he feared it would be difficult to get it in its present form through such a tribunal." We hope that Mr. Scrutton's fears will be more than realised, and that the Bill, in its present form, will be rejected. If Sir Benjamin Stone, or some other photographic Member of either House, will lend a hand to that end, we promise him the gratitude of all photographers.

* * *

PROFESSOR KENNEDY, who presided at a lantern lecture on "Round about the Matterhorn," given by Mr. Henry Speyer, at the Camera Club, in November last, is reported in the March number of that excellent institution's *Journal*, to have given utterance to the following remarks at the expense of some of our contemporaries and ourselves. He said that those who studied photographic weekly literature were aware that there was one pervading idea among the gentlemen who catered for them every Friday—namely, that it was impossible to photograph a cloud and anything else at the same time and on the same plate. He would ask the gentlemen who wrote in that peculiarly irritating manner to look at Mr. Speyer's slides, from which they would see that the extreme high lights in the clouds and in the snow could be included in the same negative with rocks which were in deep shadow, but which were at the same time full of detail. The fact of the matter was, that the people who insisted that this could not be done either did not know how to do it—which was quite possible—or, more probably, would not take the amount of pains that Mr. Speyer had taken.

* * *

As we are among those who cater for photographic readers every Friday, the remarks of Professor Kennedy demand on our part a word of rejoinder. It is almost needless for us to say that we have never taught the absurd doctrine that it is "impossible to photograph a cloud and anything else at the same time and on the same plate." The inclusion of cloud and landscape in the one negative is a perfectly practicable matter in most cases, and there is no commoner remark amongst the many landscape photographers of our acquaintance than that "the clouds are in the negative" of such-and-such a view. The use of colour-sensitised plates and a light filter makes cloud photography of this kind a matter of the greatest ease and certainty—but it is remarkable to note how

successfully such work may often be accomplished on ordinary plates, as Mr. Speyer's beautiful photographs amply prove. In protesting against Professor Kennedy's sweeping remarks, we also consider ourselves justified in expressing surprise that those gentlemen who are responsible for the editorial control of the *Camera Club Journal* should have permitted that publication to be made the vehicle of such strictures.

* * *

WE have received two illustrated pamphlets dealing with the Illinois College of Photography at Effingham, Ill. One of them gives a view of the College, which is said to be the finest photographic building in the world. It appears to be a comfortably sized mansion, and the principal is Mr. L. H. Bissell, whose efforts to establish a college of photography have secured the unstinted recognition of the local press. Mr. Bissell gave 50,000 dollars for his mansion, and this is described as "the biggest real estate deal in years." The second of the pamphlets before us is the prospectus of the Illinois College of Photography, of which the following constitute the "officers and faculty:" L. H. Bissell, President, Department of Practical Business Methods of Photography; John W. Krauth, Superintendent, Department of Carbon and Platinotype; Ruby Winston Bissell, Department of Artistic Retouching; Felix A. Raymer, Demonstrator in Department of Lighting, Posing, Composition, and Process Work; John A. Mumper, Department of Retouching and Dark-room Work; Clara Weisman, Department of Artistic Retouching, Modelling, and Etching; Joseph H. Hickman, Department of Printing, Toning, and Finishing; Dr. Henry Eversman, Treasurer; Aurora L. Buckner, Secretary.

* * *

THERE are portraits of the professorial staff and views of the reception room, parlour, retouching rooms, &c., in the prospectus. The college has a decidedly professional aspect, and its main object is obviously to impart to would-be professional photographers sufficient knowledge to enable them to successfully conduct a portrait business. The prospectus tells the inquirer that when a picture is taken with the camera it is made upon a glass plate, which, after development, shows the object in shades of black and white inversely. "This plate is called the negative, in which all little imperfections of the skin, together with the shadows, wrinkles, and facial blemishes, are necessarily exaggerated, and must be overcome by hand-work in order to produce a correct and pleasing picture. It is to improve the picture by removing and softening these blemishes that the plate is sent to the "retoucher," who works upon the negative itself with fine pencils. The great secret why one photographer's work is better than that of another lies in the fact that he excels in posing and lighting. The photographer who has picked up his business in the ordinary manner does this work indifferently because he has not learned the best and most modern methods. To become a good workman in this requires careful drilling by expert instructors. Photography possesses an educational as well as a recreative value, since some knowledge of chemistry, physics, and the principles of art is necessarily acquired by practical work with the camera, aside from the training in accuracy and observation, which are not to be undervalued."

* * *

THE vexed question of articling pupils in photography, which recently received some attention in our pages, comes in for

recognition in the Illinois prospectus, which points out that it is a difficult matter to get a first-class photographer to take an apprentice. "Good photographers have all the work they can attend to, and have no time to devote to a pupil who, in order to get into a studio, is obliged to take a place in some second or third-rate institution. Here he is expected to do the studio drudgery and perform all the odd jobs about the place. While this is possible for a young man, it is altogether impracticable for a lady to take a position under these conditions and derive any benefit therefrom. Occasionally an opportunity is offered to learn something of the real business, but it is fragmentary and unsatisfactory. If the photographer is a good one, he has all he can attend to, and, from want of time, can give only an occasional suggestion, thus allowing the student to fall into errors, serious in their results. In a year or two, such an apprentice, if he has any natural aptitude, may acquire enough of the business to get employment with some third-rate photographer. The advantage over this of a genuine course of study is apparent. Our instructors are secured with especial reference to their ability to teach the art, and are continually guiding the progress of the student. The smallest detail of the student's work is watched, and all necessary hints and helps afforded, thus fitting him in the shortest possible time to do the best of work."

* * *

THE College is non-residential. The prospectus says that a student of ordinary taste, who will attend strictly to his study, can become proficient in from three to five months—rather a short time in which to turn out a skilled portrait photographer, we may point out. The College teaches, and frequent class demonstrations are given on, opals, plain transparencies, coloured transparencies, lantern slides, celluloids, collodion, gelatine and bromide papers, platinotype paper, carbon printing, X-rays, flashlight, posing, lighting and composition, copying, enlarging, retouching, dark-room work, landscape, and architectural work, &c. Frequent demonstrations are also given by the leading dry-plate and paper demonstrators of the country. Four methods of retouching are taught—English, French, American, and German. It will be observed that the students obtain a great deal for their money, namely, a hundred dollars for the complete course. On the whole, we should judge that, while the Illinois College of Photography is not the place whence we should expect to receive a crowd of Crookes, Harold Bakers, Walter Barnetts, Craig Annans, Hollyers, Demachys, Hollingers, Dudley Hoyts, and other princes of pictorial photography, yet fairly good workmen may be turned out there, thanks to Mr. Bissell, his staff of lady and gentlemen professors, and his very full curriculum.

VIGNETTES WITH BLACK MARGINS.

SEVERAL correspondents have recently made reference to what is, to them, a novel style in portraiture that is being produced in America, and also in Australia, which is very effective indeed. While expressing their admiration of the pictures, they have desired information as to how they are produced. The portraits in question, it may be mentioned, are vignettes, chiefly head and bust, taken with a tolerably dark background, and then, instead of being vigneted into a white margin, they are vigneted into a black or very dark one. The effect of this is to give the lights of the picture extreme brilliancy, and

cause the portrait to stand out prominently from the background. Portraits of ladies in evening dress or in light drapery possess a striking brilliancy, very different from what they have in the usual style of vignette; so they have when the face is lighted in the so-called "Rembrandt style."

Those correspondents who have written to us on the subject have evidently looked upon them as quite a new style of portrait. It is not so, however, but a very old one revived. It was, if we mistake not, first introduced by Bergamasco, of St. Petersburg, nearly thirty years ago, about 1872 or 1873. In the Society's Exhibition of the latter year Bergamasco had a very fine show of these pictures, most of them of very large size for that time—18 x 15 or larger—head and bust framed up close, without mounts. They were very excellent, and attracted considerable attention and favourable comments at the time. Although they did so, no one here seemed to have made a special feature of them. Possibly that may to an extent be accounted for by the fact that the pictures involved some little extra trouble in their production, and that photographers then were pretty fully occupied in taking the "usual thing." Be that as it may, very few pictures in that style were done commercially in this country, then or since.

Now as to the means of production, and that is what some correspondents want information upon. They may be done in different ways. They may be done by double printing or by taking the negatives vigneted in the first instance. The latter is the simplest way in the end, and then the negatives can be printed from with no more trouble than printing "full-out" pictures from ordinary negatives in the usual manner. A vigneted negative may be taken in this way. In the camera a diaphragm, or mask, with a serrated opening of a suitable size and shape, is placed between the lens and the plate, at such a distance—to be found by experiment—that the image is seen softly vigneted on the focussing screen. The box form of camera is more convenient for the purpose than one of the bellows type, as the mask in that can be the more conveniently arranged; and a further convenience with it is that a means may be easily adopted by which the position of the mask may be readily adjusted to best suit the subject to be included in the picture when the image is focussed. In place of the serrated diaphragm one of the ordinary commercial vignetting masks or glasses may be utilised. When the negative is developed, it will have the figure vigneted into a clear glass space. Hence the prints are as easily made as ordinary full-out ones, without the trouble of vignetting in printing.

The above plan, though it answers quite well with lenses of long foci, is not altogether so satisfactory with those of short foci. Therefore a better way, in practice, is to have the mask—of course of a much larger size—placed between the sitter and the camera, and at such a distance that a soft vigneted image is seen upon the focussing glass. This mask, it is scarcely necessary to mention, should be black. It may be an ordinary mounting board, with a suitable opening, in a wooden frame fixed on a rod that will fit into a head-rest stand. Such an arrangement will be found a convenient means for adjusting its height and position to suit the sitter. The mask, as we have just said, should be black, or of a very dark colour, and the best thing, perhaps, is to paste over the board a piece of black cotton velvet before cutting out the opening. If the frame carrying the mask be pivoted in an outer one of metal, and has at its lower part a rod with a weight at the end, it

can be set swinging, perpendicular-like, during the exposure, and thus further soften the vignetting. In use the camera is first arranged so as to obtain the desired image, and focussed, then the mask or screen is placed at such a distance from it as will give a soft vignette. It will be well to have masks or screens with various shaped openings, so as to suit different subjects, whether merely head and busts, or pictures including more of the figure. The background before which the sitter is posed should also be black, or of a very dark colour, as that adds materially to the effectiveness of the picture.

We said just now that dark vignettes can be obtained by double printing, but it is obvious that the camera method is the less troublesome of the two, and, furthermore, it ensures all the prints being alike so far as the vignetting is concerned. The double printing system, however, has the advantage that negatives already in existence may be utilised, and the method of doing so is this: A vignette is first printed with a white margin in the usual way. Then, after printing, a mask is placed over the already printed portion, and the dark margin printed in to the depth necessary. This is really a very simple matter, particularly if the second mask be the piece of card or paper cut from the first one and stuck on a plate of glass, and that is placed at the same distance from the print as the original one was from the negative in the first printing. In this way a soft and even vignetting will be secured without difficulty. It is almost needless to mention that the second printing should be done in a very diffused light, so as to avoid any appearance of a sharp outline.

Other methods of double printing to secure the same end will, doubtless, suggest themselves to the ingenious photographer, but the one we have just indicated will serve as a guide as to how it may be successfully accomplished.

The Projected Eclipse Expedition.—We have, on a former occasion, given brief particulars of the expedition to Spain and Africa arranged by the British Astronomical Association. We are sorry, however, to learn that, through the operation of several causes, notably the difficulty caused by the war in making definite plans for the future, the number of names entered on the list of promised ticket-purchasers has fallen so far below the minimum that it is possible the whole contemplated tour will have to be abandoned. At the last meeting of the Association, Mr. Maunder made a statement to this effect. So much disappointment had been felt that one intended passenger had proposed a guarantee fund, and offered 100*l.* towards it, and this had been increased by others to 600*l.*; 2200*l.* had been promised for tickets, but that still left a deficiency of 800*l.* It would be a thousand pities if the whole expedition should fall through, but with so much money already promised it is scarcely probable that it will. Possibly a boat of less imposing size may be chartered for the trip. The photographic harvest anticipated was so great, that we can but join in the hope expressed by Colonel Burton Brown that the efforts of the Eclipse Committee might yet be crowned with success.

Cyanide Poisoning Antidote Extraordinary.—A very strange tale is recorded in the *Paris Herald*. In New York a great murder trial has been going on for an unparalleled length of time, the death of the victim having, it is stated, been caused by the administration of mercury cyanide in bromo-seltzer water. According to this story, Professor Walter W. Scheele, a well-known authority on chemistry, called at the *Herald* Office, stated he had found that, if this cyanide were added to any liquid containing carbonic acid, it would be rendered innocuous, as the hydrocyanic acid would be discharged and the mercury precipitated in a harmless form. We are not told why the poisonous acid goes into the atmosphere instead of

remaining in solution in the liquid. At any rate, when the Professor proposed that he should there and then, in the office, take a dose of the poison, the editor declined, and proposed guinea pigs as the basis of experiment. But, when the cyanide was added to the seltzer and the guinea pigs prepared for the sacrifice, Professor Scheele snatched the cup and drank it off. In view of eventualities he put a tablespoonful of tincture of chloride of iron in a tumbler of water and instructed the horror-stricken witnesses of his act to force this mixture down his throat if he showed any signs of collapse. We thus have a graphic presentiment of the suitable antidote for cyanide poisoning.

Poisoning by cyanide is not so common as in the old wet-collodion days, when every photographer almost made use of it for fixing, and consequently there was no difficulty in obtaining the deadly compound. Its action is terribly speedy, and there is little chance of an antidote being of any service unless administered almost immediately. A singular case of prompt measures taken with success once occurred at Woolwich. A soldier had been using the cyanide to clean his silver accoutrements with. He was seized with a desire to commit suicide, and swallowed a lump of the deadly stuff. It stuck in his throat, and he quickly became almost insensible. A regimental doctor was passing the door at the time; he was called in. He at once, finding the lump of cyanide could not be extracted by the mouth in time, cut open the man's windpipe and extracted the poison, applied suitable antidotes, stitched the throat up, and had his patient all right, all in the space of a few minutes' time.

Atomic Weights.—The weights arrived at from time to time as representing the true combining proportions of the various elements are often the result of an immense amount of labour; but even then they are subject to revision, and periodically revised lists are published. We were pleased to see evidence of the fact that our ALMANAC is entirely up to date in this, as, indeed, we hope, in all matters. Last week's *Chemical News* contained a list of seventy-four elements and their atomic weights "compiled from the most recent data." On comparing it with the table in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, we found the two were identical in every respect.

A New Hydrometer.—The well-known argentimeter for ascertaining the strength of silver baths is fairly accurate as usually constructed, but, like all others, is capable of improvement. All who use this hydrometer know the loss of time and the uncertainty sometimes caused by the instrument clinging to the sides of the hydrometer jar, and Professor Guglielmo has devised a form to overcome this difficulty. He constructs the hydrometer so that the spindle, instead of, as usual, floating upright, takes a slanting position, at a greater or less angle according to the strength of the solution. A special means of reading off the amount of this slant is provided, so that great accuracy is obtained; indeed, instruments sensitive enough to show differences of density brought about by a change of temperature of only two or three degrees C. have been made under Professor Guglielmo's system.

Contact-breakers or Interrupters for X-ray Coils.—At a recent meeting of the Paris Academy of Sciences, M. Alfred Turpaine read a paper giving details of comparisons made of various patterns of the Wehnelt Interrupter. He came to the conclusion that, from the point of view of duration and economy, the English pattern, the Caldwell variation, with holes, is superior to that with platinum wire. In last week's *Nature* a description is given of a most ingenious mercury contact-breaker, brought out by Messrs. Isenthal, Poetzler, & Co., which, it states, is one of the most perfect forms of break yet devised, and more serviceable than the Wehnelt electrotype interrupter. It consists essentially of a fine jet of mercury forming one contact piece, and a series of teeth cut in a cylindrical surface, forming the other contact piece. By an ingenious arrangement the ratio of contact to interruption can be

made to vary from zero to infinity, and thus the mean current strength made adjustable to any required value, without resistances. The number of interruptions can be carried through a wide range, so many as 72,000 per second being capable of being produced if desired, a rapidity sufficient for every practical purpose.

ON THINGS IN GENERAL.

I DON'T think that what I wrote about the metric system was really read by the correspondents who disagree with me. I will quote myself: "For every-day life, our pound weight, &c., are infinitely preferable, and much more convenient, by reason of their adaptability to subdivision. . . . Any one who knows anything about buying goods in France will tell us the same thing. In the very home of the metric system the metric system, as a system, is practically non-existent, at any rate for domestic purposes." M. A. Lévy, in his courteous letter, says I seem "to ignore that a kilogramme is divided here (Asnières) into two pounds. . . . A Frenchman buys, just as readily here as an Englishman in England, one pound of bread or half a pound of coffee, . . . and asks just as easily for one quarter of a pound of butter." M. Lévy proves to the hilt my contention, for a pound is no part of the metric system, which is thus, in its own home, as I said, abundant for domestic purposes in favour of a system exactly analogous to the English. Mr. Charles L. Hett makes a stronger point against me apparently, but his parallel is not perfect. Seventy grains to twenty ounces, I think he will admit, shows at a glance the same thing as three and a half grains to the ounce. The fault lies in the way the formula is stated. How would it have panned out metrically if 160 grammes to 20,000 had been written, that being a just parallel? I do not say our system is perfect, far from it, but I do again say it lends itself much more readily to subdivision. A great advantage of the metric system is its non-elasticity; hence formulæ come to be written almost universally to one standard, and their mutual comparability follows. We do not read such formulæ as 324 c. c. water, $1\frac{1}{4}$ grammes pyro, and so on. No! we almost always put the water expressed in litres, or else in 100 c. c., and there is then no trouble in comparing one with the other. Let every English formula be written in grains per ounce, and no trouble worth speaking of would arise in comparing formulæ. As it is, taking developing formulæ alone, as issued by plate-makers, the confusion, the want of system, the utter disregard of the workers' time and trouble, is carried on to such an extent as to be absolutely criminal. As things now are, every maker is so wrapped up in his own plates that it is quite impossible for him, from his sublime height, to give to the meek users of his plates "*my*" recipe, "*my*" instructions. If the formulæ were given by French makers, they would all be so many grammes or c. c. to the litre, and a man might get a dozen makers' modes of compounding developers, and see at a glance how one differed from another. But this is not because of any virtue of the metric system, but as a matter of common practice. If every English maker would reduce his formulæ to grains to the ounce, their mutual comparability would be instantaneous. As it now is, however, he would be a smart computer who would reduce them for ready comparison in the course of a morning's steady work! *Verbum sap.*

I constantly see references to cutting prices, and the publishers of this JOURNAL very properly set their faces against such a system; but I should very much like to have a good definition of what "cutting prices" means; what, in fact, is the standard we are to go by? when is a price legitimate and when is it cut? what is the difference between "cutting prices" and "popular prices?" Can the Editors assist? This matter, be it understood, is not a sly hit at the upholders of the metric system; I have no desire to see it expressed in metres or kilos. Its elasticity would not be equal to that.

I noticed recently a query about a scratched lens, which the Editors very truly say need not affect the image at all. But I may narrate a very curious incident that once occurred in my own practice bearing on this point. I had a portable symmetrical, with

which I was taking an interior, and, no light apparently falling on the lens, I did not use any screen or shade. When, however, I came to develop the negative, there was, towards one corner, a series of markings which did not exist in the interior, and which I at first could not account for. After a tedious investigation I found the cause. The sunlight entering the building (a church) caught upon a polished brass object and was reflected obliquely to the lens. There it must have just caught against the small scratch on the lens and been projected on the plate. After this, I made a point always to keep the scratch covered over with black varnish. The loss of light was infinitesimal, and the effect upon the definition or upon the image itself was absolutely *nil*.

I have been following with much interest Mr. Fergusson's copper toning process, regarding which I observed, at a meeting of the London and Provincial Photographic Association, that one speaker stated that it had no advantage over uranium, with which all the tones shown could be produced. I entirely disagree with this. I do not deny the capacity of uranium to give varied tones, but it is, I believe, an admitted fact that uranium-toned prints are *not* permanent. That, I believe, is the view held by the inventor of the process, and the experience of most, if not all, who have practised it. Further, unless special precautions are taken, it is not possible to thoroughly wash a uranium-toned print without washing away some part of the deposit. It is not a simple matter to wash a number of prints for a sufficient time in water specially acidified. We shall hear more of copper toning, or I am much mistaken. The important point, of course, is its permanency, or the reverse. At the meeting, however, there was the experience of Mr. Haddon, who, with another copper toning process, had a picture seven years old which had not changed.

Just now I was writing of developing formulæ (again no *arrière pensée* as to metric system), and I may note one of extraordinary qualities. Here it is (extracted from a quotation from the South London Photographic Society's catalogue): "Develop with hydroquinone, 1 ounce; water, 1 ounce, with a few drops of bromide added." How am I to dissolve an ounce of hydroquinone in the same weight of water? Again: "For strong negatives . . . diluted developer used, say, hydroquinone, $\frac{1}{2}$ ounce; metol, $\frac{1}{2}$ ounce; water, 2 ounces (having in a second measure metol, $\frac{1}{2}$ ounce; water, $\frac{1}{2}$ ounce)," &c. Really this is nonsense, and it is impossible, too, to imagine what really was intended.

The unfortunate copyright imbroglio seems to be thickening, and there seems every probability that we shall have this unjust Bill thrust down our throats. It appears to me that a central authority (and who so fit as the Copyright Union?) should summarise the objectionable points as briefly as possible, and circular leading photographers in every town, asking them to request their Parliamentary Members to vote against the Bill upon the grounds given. At the risk of repetition I should, however, like to raise my protest against one standpoint taken by, I believe, the Committee of the Union which is fatal to gaining a popular verdict in their favour. I extract the following part from the *Gentlewoman*, where every week it is repeated: "IMPORTANT.—WEDDING PHOTOGRAPHS.—In the interest of our readers it is well they should be advised that, in the event of their accepting 'free sittings,' which certain photographers are systematically offering, the sitter loses all copyright in his or her own face. . . The photograph may then be sold, published, or otherwise displayed without the consent or even knowledge of the person photographed. It is not sufficient to order and pay for subsequent copies." That any photographer should contend that he has a right which he will exercise to "sell, publish, or display" a portrait against the will or consent of the sitter, whether a free sitting is given or not, is to me simply infamous. It is calculated to estrange all public and certainly all Press sympathy, and, until it is publicly repudiated, will do incalculable injury to the cause of photographic copyright. This has been said before in other words. I heartily and emphatically endorse them.

Before concluding, I would revert to a topic that a correspondent has started—the taking of photographs in a house where a studio may not be built. If the rooms of the house are lofty enough, and the windows large enough (it surely should be no great expense

to enlarge them, if too small), most satisfactory portraits can be taken without any other studio at all. At the moment of writing, I can point to two studios—one in the very heart of the busiest part of London, and the other in a street in Liverpool—where first-class work is sent out, the portraits being in each taken in an ordinary room, well lighted, but built with no reference to Photography at all.

FREE LANCE.

THE PHOTOGRAPHER'S YEAR.

MARCH.

MARCH is the first month of spring. At least so it is set forth in the Calendar. A necessary notification, if the correct seasonal division of the year be of importance, for one would not be aware of anything very spring-like, in the earlier portions at any rate, of the ordinary March. This month, more than any other in the year, comes in for an unfavourable weather character. It is put comprehensively, if indirectly, in the well-known and often-quoted old couplet, that—

"When the wind is in the east,
'Tis neither good for man nor beast."

For the wind is characteristically in the east in March, and the month must so carry at least a share of its proverbial ill repute. We expect too much, perhaps, too early. The impression we have of spring has been built up from odds and ends of reading, generally in the form of poetic praise, combined with the personal remembrance of its more mature, pleasanter aspect later on. It is unfair to expect this to be satisfied at a first appearance. The season should be regarded more as one of organic growth, and its full wealth not looked for so soon after birth, more than the full proportions of manhood or womanhood are expected in a baby. It is not wise, either, to place over-much reliance upon a proverb. The fuller truth is very often sacrificed in it to a pithy or rhythmic effect. The peculiar smartness, too, that one naturally looks for in a proverb-maker is associated with a certain dilettantism; rather than robustness. Your hearty man of brawn is too busy with the practical concerns of life to find time for selecting words and polishing phrases. Were he to turn out his proverb in this case, it would probably run in a reverse direction to the classical one quoted, and be in praise of the blustering wind, good for one of his firm and healthy stamp. The nearest he comes to it is in saying in a plain, English shopkeeping way, that "a peck of March dust is worth a king's ransom." Wind again, for dust clearly supposes wind. Wind is evidently a characteristic feature of the month from a proverbial point of view; one borne out by experience as correct, whatever of its effects and value. To form a necessary portion of the year's record from our particular point of view, it must be photographed. An impossible-looking matter enough at first sight. But the apparently impossible, upon nearer acquaintance, often turns out easier of accomplishment than the commonplace. So wind, spite of the Biblical statement that "no man knoweth whence it cometh, nor whither it goeth," can be photographed. Not, of course, in its airy invisibility, but by suggestion of its presence and effects; yet none the less effectively in this manner, but rather the more so. A suggestion, if a telling one, can create a far deeper impression than an elaborately finished picture. In the one the recipient is involuntarily forced to create his own picture—a pleasing labour if the scrap of suggestion take his fancy, and one far more likely to give satisfaction than in the alternative case of having to admire another man's picture, which, in the lack of personal effort, is less closely interesting.

It is admittedly hard to give no more than a suggestion by photography; but it can be, and has been, done, and probably, if more thought were given to possibilities in this direction, photography would not be found to be so hard and unsuggestive an art as it is commonly held to be. The lines along which suggestion has hitherto been successfully and artistically presented have been more the quiet, restful, peaceful ones—a summer woodland scene, sand dunes, stretches of marshy fore-shore intersected by muddy estuaries, a sailing boat moored at an old-fashioned jetty, or stranded at low ebb. The attempt to suggest action and motion has been rarer, and not so successful, partly from the technical difficulties in the way, partly from the tradition that it is without the pale of photography. The projected excursion is postponed if it be a windy day, even the breath of a breeze first allowed to pass over before an exposure is made. This is one item that helps to give its air of unnatural stiffness to a photographic picture. It is resented because it is not typical. Things are very rarely, and for but the shortest time, as still as they are represented. We fail to note, for instance, in one of a restful spot under the shade of trees, any suggestion of the slight swaying

and rustling of leaf and bough that we instinctively feel must be there. The photographer has waited to keep carefully out what, properly done, would have added immensely to its value. But the man who, to the necessary technical knowledge and skill, has added the higher faculty of thinking broadly of what he wants, and the best way of getting it, acts otherwise. Many, at present too mechanical in their methods of working, have the power of thinking. What their work would gain did they but do so can well be imagined, if only from its present technical excellence.

Gusty March wind can be shown in the bowing of tree and cloud of dust. Instantaneous exposures are practicable enough at this time of the year. It is an easy matter to show a bent tree without any blurring, to suggest a bending tree is a far more difficult one. Let any one wishful to try just keep his eyes observantly open during a walk. He will find in the progress of a blast a psychological movement, generally when the gust has passed and the tree is beginning to recover itself, when the photographic conditions are favourable. The largest practicable exposure at this particular instant—or fraction of one—will give the desired result. It is a delicate matter; the margin between failure and success, as in most human actions, is a remarkably fine one, but the result is well worth the trouble and waiting. An analogous case, where the same facts come into evidence, and are more generally known from its having been attempted oftener, is in the photographing of breaking waves. One man, short of powers of observation, or their non-use, and an unduly short exposure, will turn out waves of marble or congealed soapsuds, whilst another will present them so naturally that one almost waits expectant of the final break up and soft swish of the spreading water. Violently arrested motion pictured gives no satisfaction beyond that of having overcome a technical difficulty. The photograph of an express train gives no suggestion of the motion we naturally associate with and look for in it. The picture would be just as correct if the train were at a standstill. Conveying the appropriate sense of motion in some way is far and away a higher and more desirable object than demonstrating the rapidity of plate and shutter, the excellence of the lens, and the capacity to properly manipulate them. So with such other orthodox photographs as those representing cycling, skating, running, riding, sailing, footballing, and so on. It is extremely difficult to accomplish, but it can be done, and by the class of men it would pay best to have trying, those who think; and, as each subject will have its own peculiar difficulties, men who can think all round, and not merely in a photographic way, pinned down by the limitations of a special plate, lens, or formula. So, returning to our more immediate purpose and instance, a carefully selected, wind-swept corner, with sparing detail, patient waiting for time of action, and knowledge of the best length of that action, all in true proportion, will give the picture.

With a cloud of dust, again, the closer observer will find that it is not always a wholly obscuring one, fatal to photographic treatment, but a local whirl, recurring frequently in the same spot and assuming a distinctive form. This should suit the purpose. The thing is to catch the true position, and act at the proper moment.

If wind and dust do not offer attractions sufficiently strong to the normal photographer, or they be unsuited to his physical conditions, there are many other things he can do in March. The rarer, earlier ploughing of February has become general, and sowing added. The sower has already lent himself as a subject both to the artist and photographer. It is one particularly suitable to the latter, in its simplicity as a single figure, the slow movement, and graceful motion. There is to boot something in the act of sowing that is, and always has been, extremely attractive to a thoughtful mind—the opportunity it appears to be for the play of such feelings as blind confidence that the apparently wasteful scattering of valuable grain will be justified in future growth, the hidden nature of that growth, and its varying amount. A man is more likely to drift into thought watching a sower than any other man at his labour. It was so in pagan times, as we have ample evidence; we have the added charm and meaning of the teaching that began with "Behold a sower went forth to sow," to help out our thoughts and imaginations.

Flashes of coming warmth and sunshine there also are in later parts of the month that are more grateful even than their fuller realisation and enjoyment further on, from more immediate contrast with the gloom and barrenness of winter. The earlier, hardier flowers offer promise of the approaching brightening of the world. A pity it is that we cannot as yet photograph them in their chief attraction of colour. This will, doubtless, come in due time. Whether we will be as pleased with it upon the whole as we now anticipate is questionable. Probably there will be at least some of the disappointment such as we now feel in the inclusion of excessive detail. The optical arrangement, whatever it may prove to be, that will give a faithful representation of colour will not register it in the

same way as the eye, more than the existing lens registers the same as the eye in the amount of subject, light and shade, proportion, and so on. We will have to select colour subjects as carefully with respect to their mechanical reproductions as we now do to amount and kind of detail. But the spring primrose, occasional violet, and spray of almond bloom, with their as yet spare framing of delicate green, will certainly offer suitable flashes of simple and suggestive colouring admirably adapted to the purpose. However, this must remain over for a future photographer's year. There is no lack of suitable subjects and possibilities in this with the tools at command, provided the worker know where and when, as much as how, to use them.

NEW EXPERIMENTS WITH LIPPmann'S PROCESS.*

It is a well-known fact that the sensitiveness of printing papers, especially albumen, may be considerably increased by fuming them before exposure with ammonia. Similar experiments were made with gelatino-emulsion plates in order to improve their sensitiveness. The plates were kept from five to twelve hours in a box, on the bottom of which was placed an open dish with ammonia in it. It was found, however, that the sensitiveness of the plates was not in the least affected by this procedure.

A still open question is, Of what do the films of the finished Lippmann pictures consist? Every one would at once off-hand answer, "of silver." The facts are, however, by no means so simple. In his latest publication on Lippmann's process Professor Otto Wiener† proves that the deposited particles need not be metallic silver; they may be molecular silver, or a silver compound. Wiener states "that it might be coherent metallic silver; on the other hand, when looked through, it is brown, whereas coherent silver is well known to be blue by transmitted light."

When trying to remove the surface metallic fog, which is, doubtless, the result of the action of the mercury, by bathing the plates in nitric acid the author observed that the image was extraordinarily unaffected by nitric acid. With twenty hours' immersion of the plate in dilute nitric acid the precipitate had undergone not the least change. This is the more remarkable, in that the image is quickly dissolved by sodium hyposulphite and potassium cyanide. All these things make it strongly desirable to institute accurate researches upon the nature of the precipitate in Lippmann's colour pictures.

Of extreme importance are Wiener's new experiments on the influence of surface reflection on the colours; ‡ that, when the surface reflection has been obviated by the cementing of a cover glass, the colours are more correct and more brilliant has long been known. The reason of this Wiener has explained in the clearest manner in the above-mentioned work. It is only necessary to place the finished image at an angle in a liquid which will not swell the gelatine, and which has about the same refractive index as gelatine—for instance, ether, benzole, benzine, or xylol—in order to prove without further trouble the extraordinarily favourable action of the obviating of the surface reflection. This is attained by cementing flat-glass prisms with Canada balsam on the picture. The author has observed on various grounds, the differentiation of which would carry us too far, with earlier cementing experiments of this kind, a disadvantageous change of the colours. With the experiments now repeated these changes did not show; moreover, the colours gained enormously in brilliancy and truth in nature. Pure white actually only appears in the picture after the destruction of the surface reflection.

Of great influence on the resulting colours is the refractive index of that substance which is brought into immediate contact with the gelatine surface. If the refractive index is low, all the colours tend more towards the red; if it is high, they tend, on the other hand, more towards the blue and violet. There is here, therefore, a possibility of subsequently improving small colour falsities, caused by incorrect exposure of the development. The best demonstration of this behaviour is obtained if, as intermediate film between picture and glass prism, there is used first ether, with a very low refractive index, and then monobromo-naphthaline with very high index. For the final cementing of the prism Canada balsam is alone used, which, on account of its refractive index, which is somewhat too high for that of gelatine, can easily cause a shifting of the colours towards the blue and violet. If it is desired to obviate this fault, the image-bearing film must be coated, before cementing on the prism, with a film not too thin of a substance which has a lower refractive index than Canada balsam. Zapon varnish§ has proved useful for this, but

better still, coating the image with a thick film of gelatine. For this latter a lukewarm five per cent. solution of gelatine is poured over the picture. One always runs the danger, however, that the gelatine solution penetrating into the image may drive apart the thin Zenker laminæ, and the colour be finally shifted too far towards the red.

To obviate the fault of the shifting of the colours too much towards the violet by cementing with Canada balsam, the image-bearing film may also be breathed on. As regards the permanency of the image, it is, however, in any case better, instead of this, to warm the plates slightly before exposure. When using those kinds of Canada balsam with which the glass plate has to be warmed before cementing, it is absolutely necessary to warm the plate before exposure.

To obviate the surface reflection, it is not sufficient to cement on to it a simple piece of glass, it must be a flat prism or glass wedge. Prisms of this kind are prepared, of excellent quality and 6.5×8.5 cm., by Gebr. Picht & Co., of Rathenow.*

So that the full effect of the colours may be obtained, the reflection from the back of the glass plate must also be destroyed. This is effected by coating the back with black varnish, or by cementing on to it a black glass.

In his work on *Farbenphotographie durch Körperfarben und mechanische Farbenanpassung in der Natur*,† Otto Wiener remarks that a perfecting of Lippmann's process would be effected if it were possible to impart to the gelatine a higher refractive index by suitable additions, or to completely replace the latter with another substance of higher refractive index. The colours would not, or only very slightly, change by the change of the angle of incidence of the light, they would have the brilliancy of body colours without being them.

Experiments were made by the author in this direction during the last summer. Although they were absolutely negative, they will be briefly described, since possibly, with improved arrangements and experiments, the results may be favourable.

The author experimented with films of pure silver chloride, which, for the sodium D lines, has a refractive index of 2.06. As regards the high refractive index, the advantages of such a film over gelatino-bromide of silver are very considerable. Still more advantageous would be the use of pure silver bromide, which has a refractive index of 2.25.

The preparation of the pure silver-chloride films was effected according to the directions of Schultz-Sellack,‡ whose early death we must all deplore. As the author has not the essential apparatus for preparing this, Professor N. O. Witt, of the Technische Hochschule, of Charlottenburg, made some for him.

Small pieces of the silver chloride were laid on a well-cleaned glass plate, which was laid on a strong copper plate, which could be warmed by a Bunsen burner. Over the silver chloride a second glass plate was laid, so that the melting silver chloride would spread as a very thin film between the two glass plates. In order to keep the heat in better, and to prevent the cracking of the glass during the melting, which was effected at 260° C., the glass was covered with an asbestos cover.

When cold, the glass plates with the silver chloride film lying between them stuck fast to one another in an extraordinary manner. When placed in warmed concentrated nitric acid, which does not attack silver chloride itself to any marked degree, but creeps between the glasses by capillary attraction, the separation could be easily done. Instead of warm, cold nitric acid can be used, but the plates must stop in it for a day.

Obviously, all this must be done in the dark room, since we are dealing with a light-sensitive body; but the sensitiveness of pure silver chloride is very little.

There is obtained in this way extremely thin, glass-clear, flexible sheets, which can be used on a glass support the same as any other photographic plate.

The exposure was made in the usual way for Lippmann's process by the aid of a mercury dark slide and spectrograph. As pure silver chloride is only sensitive for blue and violet, one ought only to expect the appearance of these colours. Development was effected with the most varied developers, and also with physical developers. These did not show, however, the trace of a single colour. The dark silver precipitate caused by development rested on the outer surface, and quickly dissolved in sodium hyposulphite. After a short immersion in hypo, the film became again glass-clear; with long immersion the whole of the silver chloride was dissolved.

DR. R. NEUAUSS.

* Continued from p. 28.

† Wiedemann's *Annalen*, 1899, vol. lxix. p. 493.

‡ Wiedemann's *Annalen*, 1899, vol. lxix. p. 488.

§ Celluloid or pyroxyline dissolved in amyl acetate or acetone or a similar mixture.—

EDITORS.

* Messrs. Penrose & Co., of Clerkenwell, also supply similar prisms in England.—EDS.

† Wiedemann's *Annalen*, vol. lv., 1895, p. 249.

‡ Poggendorf's *Annalen*, vol. cxxix. p. 184; and vol. cxlii. p. 161.

INTENSIFICATION AND REDUCTION.

[A paper read before the Sutton Photographic Club.]

A PERFECT negative! described by Mr. Chapman Jones as an image "of pure silver in clear gelatine," with its shadows, high lights, and delicate half-tones all in perfect gradation; but, alas! how many of us fail to produce negatives which come up to this ideal standard. Muddy-looking negatives, caused by general fog; negatives much too dense in some parts, and much too thin in others, are but too frequently met with. The question therefore arises, what, in such cases, can be done to improve the printing value of such negatives. In what follows I propose to discuss briefly some of the principal processes employed for this purpose, and, if I should be thought by some to go into what they may think trivial matters, I would simply remark that this paper is not written for past masters of the art, but for those who have still much to learn, and are desirous of learning it; and, further, that it is very often upon trivial matters, often overlooked, that success or non-success chiefly depends.

INTENSIFICATION.

I will take "Intensification" first, and, with regard to it, we may often tell as soon as a plate has been fixed and washed, before it is dry, whether the negative so obtained is suitable for printing from, or whether it requires to be intensified or reduced, in whole or in part. I will assume it is thin and requires to be intensified; the next point is whether it wants much or little intensification, because on this will depend the choice of which intensifier to use, some giving greater density than others. Another point is whether the negative is a clear one, or whether a slight veil is over it; this can be determined fairly well by the rebate, if that is clear all round, except, perhaps, against the sky line, then all is well, but if a thin film of deposit is on it, the assumption is that the entire negative also has this film, and it is desirable to clear this away, because, if left, it would partake in the general intensification. But to do this means reduction, and it will be referred to again under this heading.

PRELIMINARY PROCESSES.

1. The negative must be *very thoroughly* fixed, and all traces of hypo must be absolutely removed; very thorough washing, followed, should there be any doubt, by immersion in—

(a) Peroxide of hydrogen, 8 c. c. of a 10 volume solution, to 160 c. c. of water. Soak in this for half an hour, then wash; or,

(b) Saturated solution of alum, acidulated with *pure* hydrochloric acid (about 15 c. c. to 600 c. c. of alum solution), soak for half an hour and thoroughly wash. The acid is necessary, not only for the more perfect destruction of the hypo, but to prevent the alum from unduly hardening the film, which would interfere with subsequent operations; or,

(c) Iodine, made by dissolving iodine in a strong solution of potassium iodide till of a black colour, adding some of this to water till of a sherry colour, and immersing the plate in this till a blue colour is persistent, which shows the hypo is gone; the negative is then rinsed, and placed in a ten per cent. solution of sodium sulphite to remove excess of iodine, and washed.

The absence of hypo in this or any other operations in which its presence is undesirable may be proved by testing the washing water from time to time with iodide of starch, the blue colour of which is destroyed by hypo; or with potassium permanganate, the pink colour of which is destroyed, and a brown precipitate of manganic oxide caused, by hypo.

2. Unless the freshly developed and still wet negative is going to be operated on, it is better to soak the dry negative for half an hour in water before proceeding to intensification, because, by so doing, more uniform results are likely to be obtained. Exception to this, however, may occur when *local* intensification or reduction is going to be resorted to, *vide infra*.

The negative is now ready for the actual intensifying process, and we have a good selection to choose from.

THE VARIOUS PROCESSES.

1. The image is first *bleached* by the application of a certain chemical, and afterwards darkened by another chemical, producing greater density.

2. The image is darkened by the application of certain chemicals, *without* previous bleaching.

(a) Two-solution intensifiers.

(b) One-solution intensifiers.

3. The image, after being bleached, is treated like an exposed but undeveloped plate. This is called intensification by redevelopment.

PROCEDURE.—TWO-SOLUTION INTENSIFIERS.

In the first case, where bleaching precedes the darkening of the image,

the chemical generally employed is mercuric chloride, but I shall give one formula in which a cupric salt is used. Take as follows:—

Mercuric chloride	6 grammes.
Potassium bromide	6 "
Distilled water	300 c. c.

Or—

Mercuric chloride	5 grammes.
Pure hydrochloric acid	1 c. c.
Distilled water	100 ,

Or—

Mercuric chloride.....	20 grammes.
Sodium chloride	40 "
Distilled water	1000 c. c.

Acidulated with *pure* hydrochloric acid.

Dissolve either of these, and filter if necessary, because any undissolved particles of the mercuric salt would probably produce stains on the negative. Either of these solutions may be used again and again, so long as they produce the bleaching effect. Remember that they are all very poisonous. Into this solution put the negative, *well washed and free from hypo*, until it is *bleached right through*, and appears of a white, or greyish-white colour on both sides. Some authorities say that the bleaching need not go *through* if only a slight effect is desired, but this requires judgment and practice, and it is better to do it thoroughly. I may here say that Dr. Eder states, that the first of these three formulæ gives rather more density than the other two, and also that the image is less likely to be acted upon if sulphite of sodium is used afterwards; see translation of his paper, THE BRITISH JOURNAL OF PHOTOGRAPHY, February 2, 1900, p. 68; also *Photography*, same date. After thorough washing, the negative is ready for the darkening solution; there are several to choose from.

(a) A ten per cent. solution of sodium sulphite, till the bleached image is darkened right through. As stated in Dr. Eder's paper, above referred to, the plate should not be left too long in this, or a reduction may take place. This gives very good results, and gives a bright, sparkling negative. If insufficient density occurs, the process of bleaching and darkening can be repeated, a second, or even a third time.

(b) A solution of ammonia, containing, say, 1 c. c. of the '880 solution to 30 or 40 c. c. of distilled water, till the image is darkened through. This gives rather more density than the sulphite, and has always been a favourite.

(c) A solution of potassium-silver cyanide, made as follows:—

No. 1.

Silver nitrate	6 grammes.
Distilled water.....	400 c. c.

No. 2.

Potassium cyanide.....	6 grammes.
Distilled water	40 c. c.

Add No. 2 gradually to No. 1, till the precipitate first formed is *almost but not quite* redissolved. When the image is blackened right through, remove the plate and wash it, as, if left in too long, a weakening effect will probably result. This solution gives very decided results, and is useful for very thin negatives. Sir W. Abney has great faith in it. This is Monkhouse's formula:—

(d) A solution of ferrous oxalate, composed as follows:

Saturated solution ferrous sulphate	4 c. c.
Saturated solution potassium oxalate.....	24 ,
Distilled water	12 or 16 ,

No bromide is required, and the solutions should be acid. It is advisable, too, to use distilled water all through this process, or a deposit of oxalate of lime may be deposited on the film. Of course, the first washings, to remove the iron must be in distilled water acidified with acetic acid. This process is much recommended by Mr. Chapman Jones. Instead of ferrous oxalate, another developer may be used, these constitute intensification by redevelopment.

I now come to a bleaching process *not* dependent on mercuric chloride, viz.:—

Bleach in a bath containing 25 grammes each of cupric sulphate and potassium bromide in a litre of water. Wash, and immerse for a short time in a two per cent. silver nitrate solution. Again wash, and place in a bath composed as follows:—

Hydroquinone.....	10 grammes.
Sodium sulphite	75 "
Sodium carbonate.....	150 "
Distilled water	1000 c. c.

If sufficient density is not obtained, do not dry, but repeat the three operations (*Bull. Soc. Fr.* 15, 313, and *Phot. Journ.* for July 31, 1899, also *THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC*, 1900, p. 950).

ONE-SOLUTION INTENSIFIERS.

There are many of these, some whose composition is secret, others whose composition is known; it is to these latter alone that I shall refer, and I will take first the—

Uranium Intensifier.

No. 1.

Uranium nitrate	1·5 grammes.
Acetic acid	16 c. c.
Distilled water	320 "

No. 2.

Potassium ferricyanide (clean)	1·5 grammes.
Acetic acid	16 c. c.
Distilled water	320 "

Mix these in equal proportions, and allow the *very thoroughly* washed negative, previously soaked in water if it has been allowed to dry, to remain in this till the desired result is obtained. If carried too far, washing will reduce it again, or the *very careful application* of a *very weak* solution of ammonia. This process gives very great increase of density.

The next three depend for their action on mercuric iodide, and are very simple and give good results. Full details of these processes may be found in the *Bull. Soc. Fr.* (2), 15, 472, the *Phot. Journ.*, November 30, 1899, *THE BRITISH JOURNAL OF PHOTOGRAPHY*, December 29, 1899, by Lumière and Seyewitz; also in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, February 2, 1900, and *Photography* of the same date, by Dr. J. M. Eder. These authors, following Edwards and Professor Vogel, instead of using the simple solution of mercuric chloride in potassium iodide (No. 1 below) employ instead a solution of the mercuric iodide in sodium hyposulphite or sodium sulphite. I will give the three formulæ:—

No. 1.

Mercuric chloride	4 grammes.
Potassium iodide	12 "
Distilled water	400 c. c.

The quantity of iodide must be *just sufficient* and no more to redissolve the brilliant red precipitate at first formed.

No. 2.

Mercuric iodide	6·5 grammes.
Sodium hyposulphite	8 "
Distilled water	65 c. c.

Dissolve the two salts in the water, and the solution is then ready for use.

No. 3.

Mercuric iodide	1 gramme.
Sodium sulphite	20 grammes.
Distilled water	100 c. c.

Dissolve these in the same way as No. 2. M. Lumière says the *anhydrous* sodium sulphite is preferable, in which case use half the quantity of it. This salt is very useful, and keeps much better than the crystallised sulphite. Add it to the water and not *vice versa*.

With all these, intensification goes on evenly and steadily, and can be watched and controlled. Should a yellow colour obtain, it can be removed by the application of a ten per cent. solution of plain hypo. But I have a negative (shown) done six years ago in No. 1, it is as you see of a brilliant yellow colour, and gives a perfect print. Agfa and the Platinotype Company's Perfect Intensifier also give good results.

REDUCTION.

I now come to reduction, and, although this is the term generally employed, yet I think you will agree with Professor Meldola that it is not a suitable one, as it more properly applies to the action which takes place in developing a negative, when a reduction of the silver salt to metallic silver occurs. Professor Meldola suggests a weakening agent, which suggests conversely a strengthening one, so that we should have, instead of intensifying and reducing, strengthening and weakening.

Well, whichever term is adopted, I will take first the old and well-known Farmer's reducer, which consists, as you know, of, say, a twenty per cent. solution of hypo, to which has been added a few drops of ferricyanide of potassium, sufficient to impart to it a lemon yellow colour; or, the negative may be taken from the fixing bath and placed in an aqueous solution of the ferricyanide of the same tint. The action takes place quickly and must be carefully watched; the plate is then rinsed, placed for a short time in, say, five per cent. solution of plain hypo, and finally well washed and dried. For clearing off fog, previous to intensification,

vide supra, this reducer is well suited. But, inasmuch as this reducer unfortunately attacks the shadows more than the high lights, and consequently the half-tones, which it is so desirable to maintain, are damaged, therefore it was a boon and a blessing to photographers when, about a year or a little more ago, it was announced that a salt, not new in itself, but new in this application of it, was found which exactly reversed the action of the Farmer reducer. This salt was ammonium persulphate (see *Photo Journ.*, January 31, 1899, a paper by Lumière and Seyewitz, translated from *Bull. Soc. Fr.*, iv. 395), and a very valuable reducer it has proved, *vide* a most able paper by Professor Namias, translated in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, April 13, and May 5, 1899. It should be used in a two per cent. solution, *freshly made*, as it is decomposed by keeping in solution; the freshly developed and wet negative, or a dry one, is placed in this solution, when reduction takes place uniformly all over—it takes longer with a dry negative—and can be stopped at any stage that may be considered necessary. It will be noticed that the high lights have been reduced very much more than the shadows, and the half-tones scarcely interfered with at all. This is due to the action taking place mainly at the back of the film, *i.e.*, the densest part, and explains why a dry film is more slowly acted on than a wet one. There is one exception to the above statements, *i.e.*, in the case of "Cristoid films," they having no support; if they are squeegeed *exposed* side to the glass, leaving the back of the film uppermost, then either of the two above-mentioned reducers has apparently the same effect. The colour of the persulphate reduced negative is of a grey colour, and easily printed from.

Then we have three more reducers, *i.e.*, Haddon's, the exact form for which I am not quite sure about, but the following answers very well:—

Potassium ferricyanide	1 grammie.
Potassium sulphocyanide	1 "
Distilled water	250 c. c.

In this the action goes on evenly and not too rapidly, and affords a good, easily printable negative. The next reducer is a very simple one, does not require the negative to be thoroughly free from hypo, and keeps well. Its composition, as given by Professor Namias, is as follows:—

Potassium permanganate	1 grammie.
Sulphuric acid (strong)	2 c. c.
Distilled water	2000 "

Dissolve.

This acts uniformly, fairly quickly, and yields a clean printing negative. It cannot be used again, as after once using it no longer keeps. Should a brown stain be produced, it can be removed by a one per cent. solution of oxalic acid.

The last reducer to which I shall refer is mentioned in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, March 10, 1899, by Mr. J. S. Teape, who gives the following formula:—

Potassium bichromate	3 grammes.
Distilled water	32 c. c.

Dissolve, and take of this

Sulphuric acid	4 "
Distilled water	128 "

Mix, and add of this 2 c. c. to every 200 c. c. of water.

Reduction takes place evenly right through, and is more suitable for a negative which has been allowed to become dry than Farmer's.

For *local* intensification or reduction single solutions are better than two solutions, as the final action is at once observed; it is best to work with a brush on a *wet* negative, or a hard line may be produced, although, if only a *very local effect* is wanted, then a dry negative is best, as spreading is avoided.

Although I have not nearly exhausted all the possible intensifiers and reducers, I believe I have mentioned the best, and those, perhaps, most frequently used, but still it is true, as stated in an editorial article in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, September 1, 1899, p. 547 entitled, "Reduction and Intensification in Professional Work," that the mercuric chloride followed by ammonia, or the mercuric iodide in hypo, and Farmer's solution, or ammonium persulphate, "really give us in four methods all we need or desire for portrait or landscape intensification or reduction."

In conclusion I will hand round a series of negatives which have been treated by each one of the different processes I have described, and Mr. Hoole will be good enough to throw on the screen lantern slides made from these negatives, you will then be enabled to judge of the effects produced; we will then have a look at those negatives which have been undergoing treatment during the time I have been reading this paper.

J. H. BALDOCK, F.C.S.

FOREIGN NEWS AND NOTES.

Intensification with Sulphocyanide of Mercury.—Dr. Eder reports, in the *Photographische Correspondenz*, that Dr. Eberhard has made further experiments with sulphocyanide of mercury (agfa) on the lines suggested by him. The experiments show that intensification can be very successfully carried out by means of sulphocyanide of mercury, followed by an iron developer. Dr. Eberhard prepared the intensifier by taking a few 100 grammes (generally 200) of bichloride of mercury, dissolving it in about 50 c. c. of hot water, and afterwards adding a saturated solution of sulphocyanide of ammonium in sufficient quantity till the powdered sublimate passed into a colourless solution. By repeated additions of sublimate, followed by additions of sulphocyanide of ammonium, a saturated solution of high specific gravity may be obtained. This should be reduced considerably for use by addition of water. It is desirable to prepare the intensifier with a slight excess of sulphocyanide of ammonium, otherwise a precipitate of sulphocyanide of mercury may be formed, especially if the plates have been rather imperfectly washed. After treatment with the solution of sulphocyanide of mercury, the plates should be blackened by means of oxalate of iron.

The Speed Numbers of Plates.—Dr. Eder also draws the attention of German plate-makers to the importance of following the example of many English plate-makers in marking the boxes with standard numbers indicating the speed of the plates. Although German plate-makers have hitherto shown themselves disinclined to supply their customers with the information, Dr. Eder thinks they will before long be compelled to meet the wishes of photographers in this respect. After citing the example of Messrs. Marion & Co., Cadett & Neall, and the Imperial Dry Plate Company, who all send out speeded plates, Dr. Eder draws attention to the practice of the Kodak Company, who mark their packets of films with a time limit, within which they must be developed. This notice saves the photographer many disappointments, and is highly commendable. The writer also points out that English manufacturers do not hesitate to affix low speed numbers to their boxes of ordinary plates, photographers being sufficiently well informed to appreciate a slow plate for qualities which are not usually associated with speed. Dr. Eder recommends the Scheiner system, which is a modification of Hurter & Driffield's. This is to be regretted, as a uniform system has important advantages. According to Dr. Eder, English ordinary plates measure about 10° Scheiner, rapid plates and Eastman films about 14 to 15°, and commercial extra-rapid plates up to about 17°. Messrs. Schattera of Vienna, have just adopted the Scheiner system of speed-marking.'

Dextrine.—Dr. R. E. Liesegang, according to the *Chemiker Zeitung*, has found that nitrate of calcium enhances the solubility of dextrine considerably. He recommends as a mountant:—

Dextrine	800 grammes.
Nitrate of calcium	200 "
Water	1000 c. c.

Dextrine has not, however, enjoyed a high reputation in this country in relation to the permanence of silver prints.

Starch in Emulsions.—We recently drew attention to the lawsuit now pending in Germany concerning the validity of a patent for the use of starch in emulsions. The *Deutsche Photographen Zeitung* now attacks the subject from the historical standpoint, and begins a series of references with a translation of an article on hard gelatine, from the pen of C. Beckett Lloyd, which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY on March 31, 1882. Exception is often taken to the English system of granting patents without inquiry as to the novelty of the invention. In Germany the opposite system prevails, but the *Deutsche Photographen Zeitung* remarks that the present case once more shows that the decision of the patent authorities as to the novelty of an invention is utterly valueless, the means of arriving at a true conclusion not being at their command. Our contemporary summarises Mr. C. Beckett Lloyd's article as showing that starch was used to lower the setting quality of hard gelatine, and to render it more permeable to the developer and fixing agent. The gelatine was used for emulsifying and the starch subsequently added, or *vice versa*. The starch was boiled in either case, precisely as in the "Junk Process" now being contested in Germany.

The Camera at the Paris Exhibition.—We read in the *Moniteur de la Photographie* that no restrictions will be placed upon the use of the hand camera for taking general views at the

Paris Exhibition. A charge of 50 cents will be made for each time a stand camera is used. Photographs of any special exhibit may only be made by consent of the exhibitor. These regulations appear to have given general satisfaction.

The Kinematograph in Vienna.—The *Wiener Frei Photographen Zeitung* mentions that a film ignited recently at a performance at the Vienna Colosseum, but the blaze was speedily extinguished, owing to the precautions imposed by the authorities. The apparatus had to be submitted to the head of the municipal fire brigade, who ordered it to be enclosed in a case lined with asbestos. During the performance two firemen had to stand near the apparatus, each with hose in hand, ready to throw water upon it in the event of accident. Communication between the apparatus and the stage had also to be established, so that the lights might be immediately turned up in case of need. It appears that a few sparks from the illuminant ignited the film, but the hose was immediately directed upon the kinematograph, and the spectators were reassured by the lights being turned up.

Dragon's Blood.—Concerning the solubility of this gum, C. Fleck writes as follows in the *Photographische Chronik*: Dragon's blood is partially soluble in oil of turpentine, and imparts to it an orange-red tint, in the proportions of 20 grammes of red gum to 100 or 120 c. c. of oil of turpentine. If the filtrate from this solution is poured upon a sheet of glass, it will be seen that a small portion of the gum has been dissolved. The film is extremely thin, dries smooth, is slightly iridescent, but without body colour. It takes the pencil, and would be a suitable retouching medium. Sixty grammes of dragon's blood were placed in 120 c. c. of oil of turpentine, well stirred, and, after standing a few days, filtered. The solution was of deep carmine colour. When the filtrate was again poured upon the dragon's blood at 60° C., the colour deepened to such an extent that the solution did not transmit any light. This solution gave a rather thick film, slightly yellowish-white, dried rather slowly, and became very hard. It would be a very good substitute for Japan lac, and useful as a negative varnish. The remainder of the dragon's blood (now somewhat purified) was treated with ether. A further constituent of the gum was removed, and, by repeated washings with oil of turpentine and ether, a black, amorphous mass resembling asphalt was obtained. This was only slightly sensitive to light when dissolved in crystallisable benzole, and the solution was of a dark, opaque colour, yielding a red film, which acquired greater intensity with heat. The solution is, unfortunately, of no practical value, as it is much less sensitive than Syrian asphalt. Dragon's blood dissolved in alcohol gives a dark red solution, and, poured upon zinc, formed an orange yellow film. Upon glass the film presented a dull yellow, iridescent colour, with a fine matt surface, which freely took the pencil. Further treatment with ether gave a deep red solution, but the film was colourless, although matt and iridescent. The surface was very delicate, and did not take the pencil. A reddish powder may be precipitated from the solution. It contains little resin, and would be suitable as a pigment for three-colour printing—the gum-bichromate process or carbon printing. Ten grammes of the powder were placed in 100 c. c. of crystallisable benzole. But very little was dissolved, and it stained the benzole red. When poured upon a zinc plate it did not yield a film. Ten grammes dissolved in 100 c. c. of chloroform gave a solution of deeper colour, but, although rather more was dissolved, the quantity was insufficient to produce a coloured film upon zinc. With caustic soda a very fine carmine lake was precipitated from a solution in alcohol and ether. The facility with which the colouring matter may be separated from dragon's blood makes it available for many purposes.

A Giant Paper Machine.—In the *Progrès Typo-Litho* some particulars are given of a new machine built for the Rumford Falls Paper Company, Maine, U.S.A. With this machine it will be possible to manufacture 35 tons of paper per day. Its length is 53½ metres, and its width 7.82 metres. Its weight is estimated at 610 tons, and it will produce a roll of paper 3.82 metres wide at the rate of 152½ metres per minute.

IMPROVEMENTS IN PHOTOGRAPHIC LENSES.

[Patent No. 24,720 of 1899.]

MR. DALLMEYER'S invention is described in his complete specification, from which the following is an extract:—

"My present object in particular is to assist the user of the 'hand camera,' and the smaller sizes of cameras, to avoid 'exaggerated' per-

spective by enabling the operator to be at a greater distance from the foreground of his subject, and yet maintain a sufficiently large image; also to obtain, by the addition of the enlarging system to his lens, enlarged details in subjects of general interest included by the ordinary lens used alone; distant objects, &c.

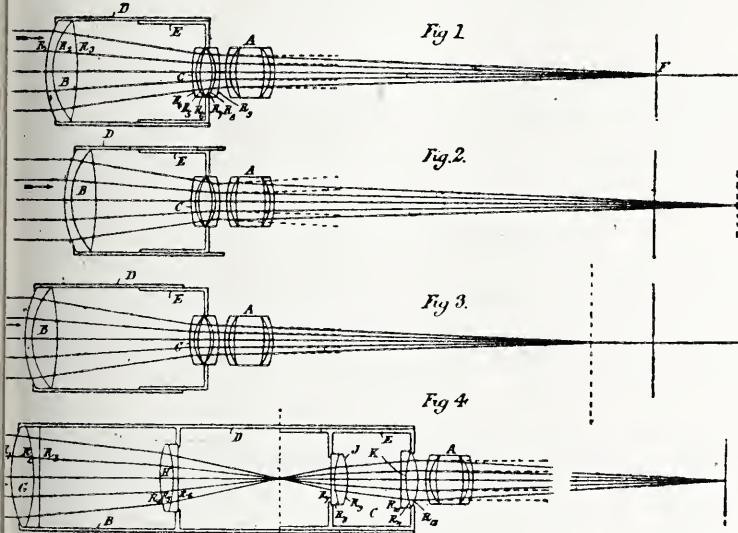
"The invention may, nevertheless, be applied to any ordinary lens to attain the ends of a tele-photographic system with greater mechanical convenience; the additional system to screw into the place of the 'hood' of the lens.

"A is an ordinary photographic lens, and B and C are the lenses making up the enlarging system. B and C are mounted in tubes, D and E, sliding one within the other, so that the distances apart of B and C can be varied, as shown in figs. 1, 2, and 3. Fig. 4 is similarly constructed, but it has not been thought necessary to show more than one position.

"The lens, B, should be of the highest intensity possible, that is to say, of the largest diameter and shortest focal length convenient, so that, when combined with C for a given linear magnification, the initial intensity of the lens, A, to which it is added, may be maintained, or at any rate diminished in a less degree than would be the case with any posterior attachment to the original converging lens, A.

"The lens, C, should be of shorter focal length than that of the lens, A, again maintaining the largest diameter and shortest focal length possible, so as to maintain, in combination with B, the initial intensity for a given linear magnification when this is feasible.

"The power of the diverging lens, C (figs. 1, 2, and 3) should prefer-



ably be equal to or greater than the sum of the powers of the converging lenses, A and B.

"According to the degree of magnification required, I decide the ratio of the focal length of B to that of C.

"When the lenses, B and C, are placed at the normal separation, that is, at a distance equal to the difference of their focal lengths as shown in fig. 1, parallel rays incident upon B will, after refraction at C, emerge parallel. Now, if we place this supplementary system in front of any ordinary lens, A, which has been focussed for parallel rays (forming an image at F in its focal plane), it is obvious that the addition of this system, which transmits parallel rays, will not alter the plane of the focus, but will increase the linear dimensions of the image in a ratio equal to the ratio of the focal lengths of B and C.

"If the effective diameter of the aperture of the lens, B, is greater than that of A, it is evident that the loss of illumination, due to magnification may be compensated for partially or entirely.

"If the ratio of the effective diameters of B and A is equal to the ratio of the focal lengths of B and C, the illumination is identical; if less, the illumination is diminished, supposing always that the full pencil of rays incident upon B is transmitted by C, which can be accomplished.

"If the lenses composing the supplementary system are brought nearer together, as shown in fig. 2, it becomes a system of variable diverging focal length, transmitting divergent rays from any object to the lens, A, thus permitting a still more enlarged image to be received at F, any distance beyond the focal plane of the lens, A, depending upon the separation between B and C for the time being.

"If the lenses, B and C are separated by any interval greater than the normal separation, as shown in fig. 3, it is obvious that it becomes a system of variable converging focal length. Parallel incident rays upon the supplementary system now emerge convergent, causing the image to be received upon a plane nearer to the lens, A, than its focal plane. In this case it will be seen that the linear magnification will be less than the ratio of the focal lengths of B and C, but the illumination may be greater than that of the lens, A, used alone. With the lenses separated as in fig.

3, it is evident that any near object may transmit parallel rays to the lens, A, with an enlarged image at its focal plane.

"It will be evident that near objects may be photographed with B and C, arranged as shown in fig. 2, but the plane of the image must be beyond the focal plane of the lens, A.

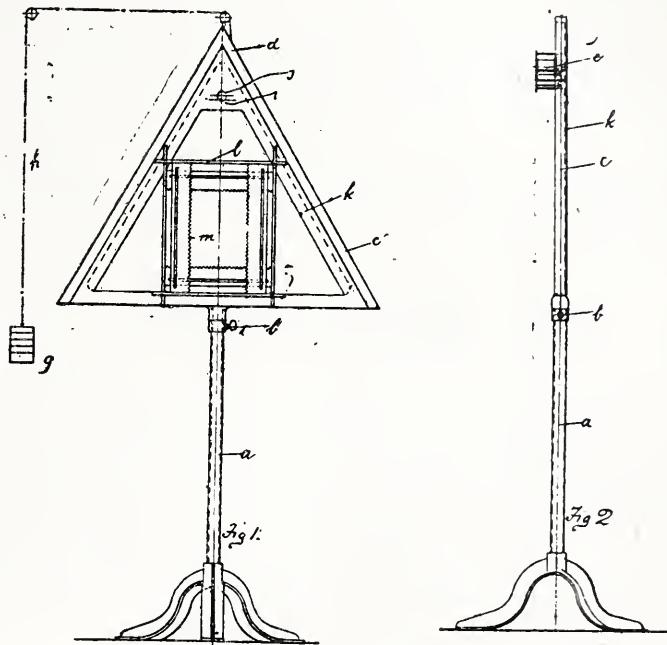
"The lenses, B and C, are each preferably aplanatic. The form ascribed to the lens, B, will determine that to be ascribed to C.

PRODUCING VIGNETTES IN COPYING.

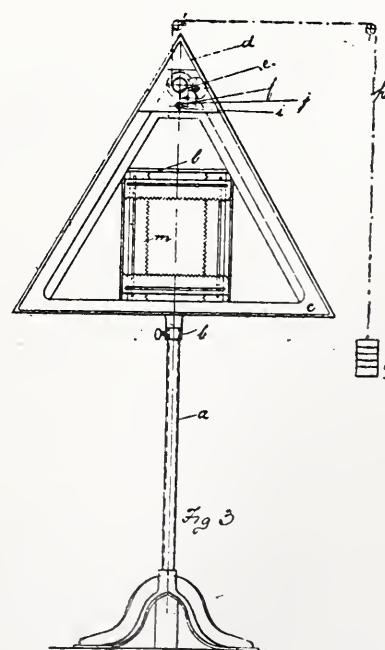
[Patent No. 5386 of 1899.]

THE inventor, Mr. W. Holt, says:—

"I place an angular or other shaped frame, c, of a convenient size for photographing the picture to be copied, and at the apex, d, of this frame I place a chain of wheels, e. Figs. 2 and 3; actuated either by a spring



in a barrel (fig. 3), or by a weight, g, acting by means of a cord, h, on a wheel of any convenient size to react (by gearing) upon the chain of wheels, e, aforesaid. By either of the above means I cause the spindle, i,



to revolve, and upon this spindle, and revolving with it, I place an eccentric, j, upon which hangs the screen, k, constructed of any light material, such as aluminium, wirework, mica, cardboard, or otherwise.

"The motion given by the eccentric, *j*, to the said screen, *k*, is an upward and downward, as well as a sidelong, motion, by which means a circular motion is produced towards the centre of the screen, where is fixed or hung the disc, *l*, carrying the serrated edges, *m*, which can be adjusted to any opening or position on the said disc by means of clips, set screws, or otherwise.

"I also regulate the speed of the said chain of wheels, *e*, by means of a brake or a fan, so that the rotary movement of the said disc, *l*, carrying the serrated edges, *m*, can be varied; and I also regulate the throw of the eccentric, *j*, by means of a slotted sliding bar, so that the travel of the said screen, *k*, carrying the disc, *l*, and serrated edges, *m*, may be varied."

THE BIRKENHEAD INTERNATIONAL EXHIBITION.

THE Hon. Secretary of this Exhibition, Mr. C. F. Inston, 25, South John-street, Liverpool, writes :—

" May I remind your readers of the fact that all entries for the above must be in my hands by Tuesday, 20th inst.

" I should also like to call the attention of those intending competitors, who already have copies of prospectus and entry forms, to an important alteration in one of the conditions, viz., the increase of limit in size of frame from 20 inches to 24 inches, at the entry fee of 1s. per frame.

" May I ask those workers who intend entering pictures to send on their entry forms in good time, as it will greatly assist in compiling catalogue, and to ask others who have not yet received prospectus to apply for them at once."

Our Editorial Table.

FERRIC AND HELIOGRAPHIC PROCESSES.

By G. E. BROWN, F.I.C. 130 pp. with Illustrations, price 2s.
London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

As a practical guide to those iron printing processes which appeal to draughtsmen, engineers, architects, and surveyors, Mr. Brown's little book should prove of the very highest service. The working details of each process are fully and clearly given, and the illustrative examples convey to the experimenter a good idea of the capabilities of the various methods of printing; especially useful are the chapters on paper and sizing, and chemicals, but the entire book is one decidedly to be recommended to those interested in these branches of photographic printing.

MR. LAMBERT MATTHEWS' LANTERNS AND SLIDES.

BESIDES sending us a catalogue of his optical projection apparatus, the portability, efficiency, and excellence of which have before now received recognition in these columns, Mr. Lambert Matthews, whose address is 97, Queen Victoria-street, E.C., has placed before us for our inspection a number of his lantern slides, which form the subject of a separate eight-page list. Amongst these are some very fine hoar-frost studies; their delicacy and brightness could hardly be excelled. Flowers and mottoes, South Devon, Haddon Hall, the Isle of Wight, North Cornwall, Suffolk, Norfolk, celebrated churches, and North London scenery, are illustrated by Mr. Matthews in his sets of lantern slides. The quality of these transparencies is remarkably good and brilliant, and we hope Mr. Matthews will find a large sale for them.

THE PHOTOGRAPHIC DEALER'S ANNUAL.

Edited by ARTHUR C. BROOKES. London: Marshall & Brookes, Harp-alley, Farringdon-street, E.C.

ADDRESSED "to the trade only," and styled "a complete guide to photographic dealing," the scope of this new Annual will at once be realised. The contents include lists of trade addresses; trade names; scientific, photographic, and trade societies; formulae; about thirty pages of articles addressed to dealers, opticians, &c.; legal information; weights and measures; and a mass of other data likely to be of service to those for whose benefit the book has been compiled. There are several illustrations, and the price of the Annual is 1s.

THE BEAM CIRCULAR PRINT TRIMMER.

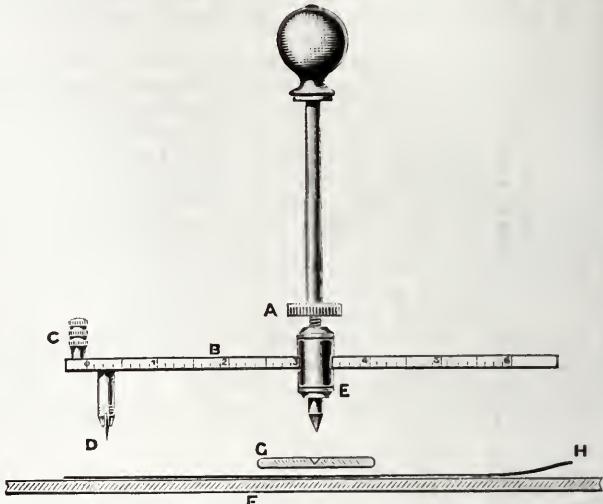
Manufactured and Sold by Geo. Houghton & Son, 89, High Holborn, W.C.

This is a simple and accurate little machine for cutting circular photographs. The method of using it will be obvious by a glance at the illustration. The beam, *B*, which is graduated in one-sixteenths of an inch, can be instantly set by means of the locking head, *A*, to any designed range from seven-eighths of an inch to six inches radius, and therefore circles from one-and-three-quarter inches to twelve inches diameter can be cleanly cut with one sweep round.

A one-and-a-half inch diameter plate glass circle, with a hole drilled partly through the centre, and the underneath part ground to prevent it slip-

ping, is supplied for the instrument to revolve upon, and the work clamped underneath is thus always in sight. For repetition work of a fixed size the position of the centre can be made to coincide each time with a predetermined point on the subject to be cut, thus guaranteeing an exact reproduction.

From personal examination we can say that the trimmer, which is



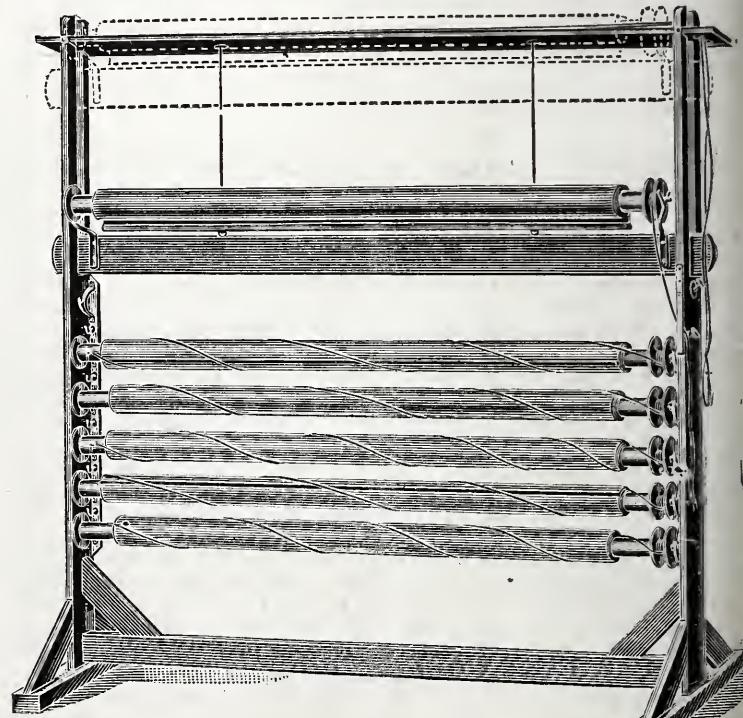
priced 7s. 6d., is light and strong. It is pointed out that all the parts are interchangeable, therefore the cutting wheel, or any other parts, can be replaced by new ones in case of accident, wear, or loss.

Circular photographs seem to be in greater favour than ever, and there could not be a neater or more expeditious method of producing than by this useful instrument.

THE HOLBORN BACKGROUND STAND AND RACK.

Manufactured and Sold by Geo. Houghton & Son, 89, High Holborn, W.C.

THIS convenient system of storing and exhibiting a variety of backgrounds should be greatly appreciated by photographers who realise the importance of saving time in rapidly getting a background into position. In use, a background on a roller is attached to a sliding bar, which can be raised to any height, up to eight feet, by means of a double cord, or it can be fixed at any point by means of a side hook. Briefly, the back-



ground can be lowered from the top like a blind or fixed in any other desired position. The system is easy and noiseless to work.

Three rollers, with pulleys attached and three sets of rack fittings, are supplied with each stand, but any number of extra rollers, &c., can be had if required. Three iron rods are also included for inserting in the bottom hem of backgrounds to weight them. The price, complete with three rollers, &c., to take backgrounds 8 by 8 feet or 8 by 15 feet continuous, and any smaller size, is 5*l.* 10*s.*

Studio Gossip.

CAMERA VIGNETTES.—M. Walde writes: "Relying to your correspondent from Hartlepool on the subject of camera vignetting, we place the vignette inside the camera behind the focussing glass. The background should be black velvet. We get fine vignettes this way."

PROFESSOR NORSHEWESKI is said to have invented an instrument, the principle of which is the sensitiveness to light of selenium and tellurium, both of which change their quality as conductors of electricity with a variation in the light to which they are exposed. In stating that the blind can see by this instrument, a relative meaning only is indicated. While the actual vision will be unaffected, they will feel the various effects of changing light by its action. It is claimed that a totally blind man has been enabled to find the windows in a room, and after some practice to distinguish approaching objects. The inventor hopes to make the instrument so efficient that the blind will be able to tell almost certainly when they are approaching an opaque or transparent substance.

WE read in a daily contemporary that some remarkable snap-shots of the war are being made in Paris. The French photographers have collected some old horses and guns, with some supers from one of the Paris theatres, who are made up as Boers or Englishmen, as occasion demands, the Boers being distinguished by their long whiskers and the Englishmen by their uniforms. Imitation breast works have even been built near Paris, and these are stormed by the supers, while the photographer takes his pictures. One single bit of truth is the picture of a ford. It shows a big tree at the left in the foreground, with a shallow river behind, and a few cows and sheep wading to the further shore. Whenever our forces have crossed a river anywhere, this picture has been used to illustrate the exact place of crossing.

NATURAL HISTORY FOR LONDON CHILDREN.—An interesting attempt is being made at the Passmore Edwards Settlement to awaken a taste for natural history among the children of the neighbouring schools who go to the Settlement. A natural history class is being formed for children in the higher standards, and Saturday expeditions into the country will be arranged as the spring comes on. As a preparation for this, a short course of popular lectures on "Bird Life" has been given by Mr. Richard Kearton, F.Z.S., to a large and eager audience of young people. The lectures were illustrated with lantern slides from the photographs which are familiar to readers of Mr. Kearton's "With Nature and the Camera," "Wild Life at Home," and "British Bird's-nests." Sir Edward Gray, M.P., whose interest in natural history is well known, took the chair at the opening lecture, and told the children in a few words who Mr. Kearton was, paying a high tribute to the value of his work.

CAN PHOTOGRAPHY LIE?—*Apropos* of the spring season, Mr. Martin R. Cobbett writes in the *Referee*: "Up to now, if one did not watch vegetable growth and the days' lengthening, particularly at the bottom end, taking the morning as the top, did not make you know a little bit where you were, you might be all abroad in your calculations in case you omitted to read your newspaper. I won't say that that instrument, like the photographic apparatus, cannot lie, because, in the first place, I am obliged occasionally to absorb the contents bills, which prove to me that newspapers, other than the *Referee*, are, some of them, talented liars, and as to the instrument in which Mr. Dion Boucicault repose such confidence, I cannot too often repeat that, if that is truthful at heart, a skilful manipulator can make it mispresent to his, the manipulator's, order and any extent. For instance, the proprietor of an American stud farm has sent me a photographically illustrated catalogue descriptive of his establishment, which comes out sweetly on paper. One of its most charming features is a picture of the 'home stretch' of a half-mile circular track. This obliging instrument makes only about a hundred and fifty yards wide and three-quarters of a mile long for the particular section represented. The whole circuit calculated to this scale would be a few miles in length."

FIRE.—Shortly after seven o'clock on Friday evening it was discovered that the premises of Mr. A. E. Coe, optician and photographer, London-street, Norwich, were on fire. Smoke was seen issuing in dense volumes from the windows, and there was every appearance of serious mischief within. The Chief Constable, Mr. E. F. Winch, Engineer Shaw, and a portion of the fire brigade were on the spot within a few minutes of receiving information, taking with them a manual and a sufficient supply of hose. Mr. Winch divided his forces, sending part to operate at the back (in Castle Meadow), and with the other attacking the fire from London-street. The premises were closed for the night, and some little difficulty was experienced in locating the seat of the fire. All possible help, however, was afforded by the occupiers of the adjoining premises, Messrs. Allen & Daws, and Messrs. Cobbald & Son. As the emission of smoke from the top story windows seemed to indicate that the fire was on one of the upper floors of the premises, a fireman effected an entrance by means of a ladder through the top window. He found that the smoke was of a most suffocating character, and, having satisfied himself that there was no flame in that part of the building, he retired. In the mean time the fireman, who had gone to the Castle Meadow side of the building, found that the seat of the fire was in a little room at the back of the shop and adjoining upon the area. A length of hose was speedily run out, and a copious supply of water was poured upon the flames. The fire was at no time of any great dimensions, and the firemen were at first surprised to find that the water had little effect in subduing the flames. The explanation was that chemicals formed the greater part of the contents of the room where the fire originated, a fact that was made very apparent by constant little explosions, and by the pungent and stinging fumes given forth. The men worked for a couple of hours in a choking atmosphere, and finally removed all the smouldering goods and left the place in a state of security. The fire was confined to its place of origin.

News and Notes.

PHOTOGRAPHIC CLUB.—March 21, at eight o'clock. "Orthochromatic Photography," by Mr. E. Sanger Shepherd.

THE Brixton and Clapham Camera Club will hold a Smoking Concert at the Canterbury Hotel, Canterbury-road, Brixton (near Brixton and East Brixton Stations), on Thursday, March 22, 1900, at eight o'clock.

THE West Surrey Photographic Society's Twelfth Annual Exhibition of members' work will be held at the Railway Hotel, 110, Ratersea-rise, S.W., on Wednesday, Thursday, Friday, and Saturday, March 28, 29, 30, and 31.

ON each night during the week the South London Photographic Society held their Exhibition a collection was made on behalf of the *Daily Mail* A. M. B. Fund. During the collection, Kipling's poem was reproduced by means of the gramophone.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, March 20, at 66, Russell-square, at eight p.m. A demonstration of "The Heliogravure Process," by Ignatz Herbst. The Exhibition arranged by the National Photographic Record Association is now open. Admission from ten to four on presentation of visiting card.

WE have received a brief intimation relating to a competition in the production of lantern lenses for balloon tele-photography. This competition is open to French and foreign opticians, and particulars are obtainable of Lieutenant-Colonel Renard, Directeur de l'Etablissement Central d'Aérostation Militaire de Chalais, Meudon (Seine et Oise).

THE KODAK AT COURT.—The privileged spectator of Saturday's Royal review at Buckingham Palace might have noticed, as I did (writes an *Echo* correspondent), that the Princess of Wales was preoccupied in taking snapshots of the Guards, and one ventured humbly to think that, if the "People's Princess" were graciously to bestow one of her khaki pictures on each soldier whose features have passed through the Royal lens, that photograph would be treated as a family heirloom for time immemorial. During the Queen's stay in town the Princess of Wales, both at Buckingham Palace and Marlborough House, has taken many photographs incidental of the war. Time and instantaneous photographs have been both secured, and then the negatives are, it would seem, sent to the Kodak Works at Harrow, where Messrs. Eastman develop and print the same with every care and despatch. Often it happens that some carefully timed exposure may reproduce so well in its original size that the Princess orders an enlargement; a visit to Sandringham would reveal several of these bigger pictures depicting memorable incidents in the busy life of the Princess. But it is in photographs of Tommy Atkins in company with his fellows and in khaki that the Princess has lately been exercising her stereoscopic zeal. It is understood that the Queen has been specially gratified to have seen, and to keep in her possession, permanent reminders of these stirring and loyal times which are the work of her own popular daughter-in-law.

Commercial Intelligence.

MR. WALTER D. WELFORD has removed from Southampton-buildings, Chancery-lane, W.C., to new and larger premises at Warwick Lodge, 166, Romford-road, E.

THE Process and Engineering Company, of 66, Deptford-green, London S.E., send us a copy of their new catalogue of dark rooms, &c., and add that they will be happy to send a copy of same on receipt of a card.

WE are informed that the old established firm of Messrs. Blundell, whose business in the treatment of photographic residues has brought them into contact with our readers in all parts of the kingdom, are shortly removing from 162 to 190 Wardour-street, four doors from Oxford-street.

MESSRS. RAE BROS., of the Photographic and Optical Material Stores, 134, St. Vincent-street, and 77, Renfield-street, Glasgow, inform us that they have taken over the business of the late Mr. Campbell, 41, George-street, Perth, and intend carrying it on as practical opticians and photographic dealers.

MR. GEORGE MACAIRE, of 41, Charterhouse-square, Aldersgate-street, London, E.C., sends us his list of entirely new art electros, for illustrating books, magazines, catalogues, circulars, &c. The designs, which are numerous and varied, have been specially prepared for the use of up-to-date printers and publishers who desire their work turned out in an artistic and attractive manner.

Patent News.

The following applications for Patents were made between February 26 and March 3, 1900:—

PRINTING APPARATUS.—No. 3728. "Improvements in Photographic Printing Apparatus." B. J. HALL.

EMULSIONS.—No. 3736. "Improved Photographic Emulsion." Communicated by La Société Anonyme de Plaques et Papiers photographiques. A. Lumière et ses Fils, France. B. J. B. MILLS.

CAMERAS.—No. 3766. "Ophthalmic Cameras for Use in Ophthalmic Surgery and Attachments to an Ordinary Camera to effect the same purpose." K. M. MONTEATH.

- ROLL-HOLDERS.**—No. 3771. "Improvements in or in connexion with Photographic Films, Film Rolls, and Roll-holders." J. E. THORNTON.
- PLATE-DRAINERS.**—No. 3816. "Improvements in Appliances for Draining and Drying Photographic Plates." T. NORMAN.
- LANTERN SLIDES.**—No. 3836. "Improvements in or relating to the Production of Lantern Slides." W. L. PARKINSON.
- PHOTOMETRES.**—No. 4010. "Improvements in Apparatus for Measuring Intensity of Light." R. C. DRINKER.
- FOCUSING.**—No. 4056. "Improvements relating to Mechanical Focus-finding Adjustments for Use in Photographic Enlargement and Reduction." A. FRUWIRTH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
19.....	Bradford Photo. Society	{ Demonstration: <i>Practical Mounting and Frame-making.</i> Percy Lund, Secco Films.
19.....	Cripplegate Photo. Society	<i>Home Portraiture.</i> F. P. Moffat.
19.....	Glasgow and West of Scotland	<i>Orthochromatism.</i> James Cadett.
19.....	Kinsteon-on-Thames	Members' Lantern Night.
19.....	Southampton	{ Notes with Illustrations on Messrs. Hurter & Driffield's Researches. H. E. Burn.
19.....	Stafford Photo. Society	Lecture: <i>Portraiture.</i>
19.....	Whitby	{ A Tour Across Canada through the Rockies and Selkirks to the Pacific. A. H. Sharpe.
20.....	Birmingham Photo. Society	{ Kachin as a Developer. Donald A. Nightingale.
20.....	Bootle	{ Colour Photography. E. J. Wall, F.R.P.S.
20.....	Brixton and Clapham	General Meeting.
20.....	Gospel Oak	{ Rambles in Somerset and Devon. E. T. Coombes.
20.....	Hackney	Trip to New Zealand. A. H. Dunning.
20.....	Redhill and District	{ Demonstration: <i>The Heliogravure Process.</i> Ignatz Herbst.
21.....	Royal Photographic Society	Seventh Annual Rummage Sale.
21.....	Croydon Camera Club	{ Orthochromatic Photography. E. Sanger Shepherd.
21.....	Photographic Club	<i>The Photographing of Flowers.</i> H. T. Malby, F.R.P.S.
21.....	Southport	Exhibition of Prize Lantern Slides.
21.....	Southsea	Demonstration: Secco Films.
21.....	Woodford	{ A Month in North Wales with Caravan and Camera. W. Allanson.
22.....	Darwen	Auction of Photographic Goods.
22.....	Liverpool Amateur	Open Night
22.....	London and Provincial	{ Lantern Slides, Illustrating the Excursion of the South London Photographic Society to Belgium in 1899.
22.....	South Norwood	Practical Evening: <i>Carbon Printing.</i>
23.....	Borough Polytechnic	(Lantern Evening: <i>Architectural Slides.</i> Rev. T. C. Clark.—Exhibition of Prize-medal Framed Prints.
23.....	Bristol and West of England	South London Society's Belgian Slides.
23.....	Croydon Microscopical	Exhibition of Prize Slides.
23.....	Glasgow and West of Scotland	

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 7.—Major-General Waterhouse, I.S.C., in the chair.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

Sir BENJAMIN STONE opened an Exhibition of about 130 photographs collected by the National Photographic Record and Survey Association. In the course of his address he congratulated the Royal Photographic Society upon the possession of adequate and suitable accommodation, and expressed the hope that it would avail itself of the magnificent opportunity thus afforded for doing a great deal of useful work. The Society occupied an exalted position as the head of the photographic world in this country, and as such it was called upon to give a lead to public thought and to exercise some little judgment in educating the public. From a photographic point of view, there could, in the speaker's opinion, be nothing more deplorable than the lamentable efforts at illustration which were at present disfiguring the public prints; in fact, there was scarcely a journal of which it might not be said that its pages were disgraced by the war pictures contained within them, the poverty of which must have struck everybody who fixed a standard such as that which he hoped was established by the Society. There were, however, occasional examples of excellent work and careful reproduction, and it should be the aim of the Society to do all in its power to foster such work, and to educate the public to recognise and appreciate it. Some of the lantern exhibitions, too, at places of amusement in London were equally bad, and steps should be taken to let the world know that that sort of thing was not the best photography that could or should be produced. With regard to the Exhibition now commencing, and to the aims and objects of the National Photographic Record Association, Sir Benjamin Stone said he hoped to be able to enlist a great deal of sympathetic assistance from photographers throughout the country for the purpose of preserving records of the current history of the time. Old woodcuts and drawings were often of immense value to historians and archeologists, but incalculable importance would attach to accurate and precise photographic records of historic scenes and incidents, such, for instance, as the Queen's visit to her people in London under circumstances so full of interest and of pathos. At the present moment the work was not treated as a national duty, but the Association might so influence public

opinion that eventually—possibly even in our own time—the Government might appoint a public photographer, whose business it would be to make permanent records of suitable subjects for the information of generations yet to come.

The exhibits include twenty-three views of Windsor Castle, by Sir Benjamin Stone; Ely Cathedral and Romsey Abbey, by J. Bulbeck; old inns mentioned in Dickens' novels, by Mr. and Mrs. Snowden Ward; Old London, by E. Scamell; and others by Messrs. Oakden, Osborne, G. Scamell, Welch, Beck, Harold Baker, Oliver Baker, &c.; and the Exhibition will remain open daily from ten to four o'clock during the month of March and part of April, admission being free on presentation of visiting card.

MARCH 13.—Ordinary Meeting.—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

BUSINESS.

The PRESIDENT announced that the Council had unanimously decided to confer the Honorary Fellowship of the Society upon Mr. H. P. Robinson, in recognition of the services rendered by him to photography and to the Society in the past. The announcement was received with hearty applause. It was also announced that the Photographic Society of Ireland had been admitted to affiliation.

Four new members were elected, and nine candidates for membership were nominated.

LIGHT IN THE DARK ROOM.

Mr. E. HOWARD FARMER read a paper on "The Illumination of Developing Rooms," in which he gave an account of detailed experiments and measurements which he had made subsequent to those referred to in a previous communication to the Society (in May 1898), and in a paper read before the London and Provincial Photographic Association, and published in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1900 (p. 803). Experiments had been made to ascertain the loss of luminosity occurring with the various light filters in general use, and the actual illuminating power in standard candles of several safe-lights, the results showing that there was an enormous loss of working light in consequence of the general opacity of the different media employed. For instance, with the best ruby glass obtainable, 92·5 per cent. of the light was lost, the intensity of that transmitted from a lamp of two-and-a-half candle power being only 1·9 candle power; with two thicknesses of green glass and one of orange, the figures were 99·2 per cent. and 0·025 candle power; and, with two thicknesses of yellow fabric, 96 per cent. and 1 candle power; the useful illuminating power with oil lamps in cases of safe illumination varying from one-sixth to one-twentieth of that given by a single candle. Further experiments with glasses and coloured solutions showed that a solution of potassium bichromate passing the same intensity of light, and apparently the same coloured light, as orange glass, was 250 times safer; and that ruby glass was about the same degree safer, but absorbed ninety-two per cent. of the light passing through it. These differences were measured with an electric arc lamp, in order to place the stopping powers of the liquid filters to actinic rays beyond question; but with oil lamps, owing to the comparative absence of the blue-violet and ultra-violet rays, the differences were less marked. A six per cent. solution of potassium bichromate was practically totally transparent to the red and yellow rays, and almost entirely absorbed the greenish-blue, blue-violet, and ultra-violet rays, so that with it the worker could retain the whole of the useful light and also increase its intensity without fear that the filter would pass the highly actinic rays. The practical outcome of all the experiments was the construction of lanterns giving an illumination of ten standard candles per nine cubic feet of space, one of which was shown. It consisted of two cylindrical glass jars one within the other, both open at the top, the diameter of the inner jar being a quarter of an inch less than that of the outer, and the space between them being filled with a six per cent. solution of potassium bichromate. An incandescent electric lamp, suspended from a wooden disc forming a cover for the jars, was switched on, with the result that the whole of the meeting room was filled with a beautifully soft light. Such a lantern had been in daily use at the Polytechnic for the past fourteen months, where it was placed on a shelf above the developing sink, so that the direct rays did not fall upon the plates, although during the last stages of development the plate could be held in the direct rays and the scale of densities judged with a degree of accuracy and confidence altogether wanting with ordinary lanterns. Orthochromatic plates could be manipulated in the same light by taking certain precautions to shield them as much as possible. At the close of his address, Mr. Farmer developed some plates in the ordinary light of the room by mixing with the developer a quantity of a one per cent. solution of xylylidine scarlet to which a little fast yellow had been added, the plates, when fixed, showing an entire freedom from fog.

A brief conversation followed, in which Messrs. Vezey, Chapman Jones, Snowden Ward, Haldon, Bolas, Debenham, Warburg, and others took part, and in reply to which Mr. Howard Farmer said the lantern he had shown was not well adapted for use with gas or oil lamps on account of their heat, but he was pursuing his investigations with the object of finding a film which would take the place of the bichromate filter. A small Wenham lamp might be adapted, but it would be very expensive, and the heat difficulty would be overcome, if a gas flame were placed above a horizontal cell containing the bichromate solution.

Major-General WATERHOUSE said he had lately been experimenting with sulphate of cerium, the use of which as a reducer had been suggested by M. Lumière, and he had been very much impressed by the fact that a spectroscopic examination showed that it had a very dark band of absorption in the yellow, and a narrower band in the green. He suggested that this strong absorptive power in the region where orthochromatic plates were most sensitive might be turned to account in the direction of Mr. Farmer's investigations.

COMING EVENTS.

March 20, "A Demonstration of the Heliogravure Process, by Mr. Ignatz

Herbst. March 27, "Some Developers Compared," by Mr. Alfred Watkins. April 3, Lantern Lecture, by Mr. F. P. Cembra, "Slides Old and New." April 10, "The Municipal Encouragement of Photography," by Mr. Thomas Bedding.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 8.—Mr. Robert Beckett in the chair.

Mr. A. J. BROWN showed an extemporised dark-room lamp, made of a stiff ruby-red material, which he had found very useful when away from home for changing plates by in a bedroom. It was conical in shape, something like an extinguisher, and was used with an ordinary night light. Like others, he had used red blotting-paper and other material at a pinch. He also showed a changing bag of an excellent design.

The CHAIRMAN said that, failing even such means as had just been shown, it was perhaps well known that a naked light, placed in the corner of a room and sheltered by one's coat, gave a fairly safe light for plate-changing purposes.

Mr. J. E. HODD sent up for examination a bromide enlargement made some time ago, and thrown aside as not being worth any care in consequence of a harshness caused by wrong exposure. Toned with copper, it resulted in a very fair print, with an apparent reduction of the dense parts and an intensification of the detail in the high lights.

Mr. S. H. FRY asked if there were any suggestions for the modification of the colours resulting from the copper toning. He observed that all the prints so toned had a peculiar dead plum-like colour, which, although pleasing in some instances, is not generally satisfactory.

The CHAIRMAN thought the improvement in the print sent by Mr. Hodd was due simply to the alteration of the colour by the copper toning. In reply to Mr. Fry, he said the resulting colour depended solely on the extent of the toning.

Mr. FRY thought that the toning of the print shown could not be said to be altogether an improvement, because the normal colour of the bromide print was more suited to the particular subject of the photograph. It was pointed out, however, that in its original state the bromide print was useless.

Mr. MACKIE had noticed that Mr. W. B. Ferguson's prints had not the pink tint which characterised some of the results he had since seen, but that they were of a good sepia colour.

The colours were also compared with those given by Eastman's hypo and alum treatment.

Mr. LEWIS MEDLAND showed slides from photographs taken many years ago on a visit to Christiania. There were several of street and market scenes, public buildings, and churches, the rest being views among the hills surrounding the Norwegian capital, and bits from them looking over the picturesque fjord and the islands, which are plentifully dotted about the immediate vicinity of Christiania. The lantern slides were on collodion plates prepared by Mr. Medland. He had cause sometimes to complain of opalescence as the emulsion became older, and wished to know the reason for the trouble.

Mr. MACKIE thought that there were several reasons, all of which he did not know, but one was that the repeated opening of the bottle allowed the solvents to evaporate, with a consequent increase in the proportion of water present to the ether and alcohol. There seemed to be no remedy for it unless one evaporated the emulsion to dryness and redissolved. As an alternative, the old batch might be used in which to make a new emulsion.

Hackney Photographic Society.—The Annual General Meeting of this Society was held on the 6th inst., and the report and balance-sheet showed the Society to be still in a very flourishing condition. The following is the result of the election of the new executive:—President: Mr. A. Horsley Hinton. Council: Messrs. E. Farmer, W. F. Fenton-Jones, C. T. Fleetwood, F. W. Gosling, E. Puttock, W. Rawlings, J. J. Westcott, L. S. Wilks. Curator: Mr. W. A. Ellington. Lanternist: Mr. H. W. Dunkley. Delegates to Affiliation Committee: Messrs. R. Beckett and W. Rawlings. Treasurer: Mr. W. L. Barker. Excursion Secretary: Mr. S. C. Stean. Hon. Secretary: Mr. Walter Selfe. Assistant Secretary: Mr. A. D. Fort.

Redhill and District Camera Club.—March 6.—Demonstration: "Ferguson's Method of Toning Bromide Prints with Copper," by Mr. J. STERRY. Formula used by Mr. Sterry was ten per cent. solution sulphate of copper, 13 parts; ten per cent. solution citrate of potassium, 100 parts; ten per cent. solution ferridcyanide of potassium, 1½ parts. By this method a beautiful variety of tones can be obtained, from black to chalk-red; but, as it is not an intensifier but a slight reducer, the development of the print or lantern slide should be carried a little further. Mr. H. SPEZER gave a short lantern lecture on "Snowdon in Winter," which was greatly appreciated. Mr. FRANCIS H. ELLWOOD showed a negative he had recently taken on a Belgian plate nearly twenty years old.

Bath Photographic Society.—March 1, Mr. G. Norman in the chair.—Mr. W. MIDDLETON ASHTON (Hon. Secretary) read the report and statement of accounts. The report set forth that eleven lectures or demonstrations had been given at the indoor meetings during the year, this being the largest record of work done in any one session. There were also three excursions arranged and successfully carried out, in addition to those attended by several members of the Society at the Gloucester Convention. The Committee report favourably on the condition of the Society, the improvement referred to last year having been maintained. The attendance had slightly increased, probably owing to the meetings being held at half-past five. After defraying disbursements, there remained a balance in the hands of Treasurer of 15s. 14s. 7d. The CHAIRMAN thought the report was a most satisfactory one, and the balance-sheet spoke for itself. He moved its adoption. Mr. A. T. DAVIES (Keysham), in seconding, expressed surprise that so much work had been done in the twelve months, it showed great vitality in the Society, and was extremely gratifying. The CHAIRMAN said his two years of service as President had come to a termination; it had been a period in which he had been very unwell

a good part of the time. He, however, did his best, and thanked the members for the post they have honoured him with. He wished to nominate as his successor the Rev. E. A. Purvis. Mr. AUSTIN J. KING had much pleasure in seconding Mr. Purvis as President. They were greatly indebted to Dr. Norman for the work he had undertaken during the past two years. Last year they suffered a shock when Mr. Ashman announced a balance of 11s. in hand, and now a further shock occurred in which 15s. had to be dealt with; such experiences in societies were quite unexpected. He was sure Mr. Purvis would be an able President, and they could not choose a better leader for the next two years. The Rev. E. A. Purvis then took the chair vacated by Dr. Norman. The following gentlemen were elected by acclamation Vice-Presidents: Colonel Sealy and Dr. Adcock (proposed by Mr. W. P. DICKSON, seconded by Mr. MOWERAY GREEN). Committee: Dr. Norman, Messrs. George F. Powell, Austin J. King, Aug. F. Perren, Colonel Blathwayt, Messrs. D. P. Williams, W. P. Dickson, Mowbray Green, and W. Pumphrey, permanent member (proposed by Mr. M. H. SCOTT, seconded by Miss BRUERE). Hon. Secretary and Treasurer: Mr. W. Middleton Ashman (proposed by Mr. GEORGE F. POWELL, seconded by Mr. AUSTIN J. KING).

FORTHCOMING EXHIBITIONS.

1900.

- March 26 Twentieth Century International, Birmingham.
Walter D. Welford, 19, Southampton-buildings,
Chancery-lane, London, W.C.
- ,, 26-31 Photographic Society of Ireland. W. F. Cooper,
35, Dawson-street, Dublin.
- April 3-7 Birkenhead International. C. F. Inston, 25, South
John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

REFLECTOR HAND CAMERAS.

To the Editors.

GENTLEMEN,—In your issue of to-day's date is a letter from "R.N.R.", in reply to one appearing in your previous issue from "A.G.B.", in reference to a Reflector Hand Camera, which from the description is practically an exact specification of one of our make, known as the "Gambier Bolton," and seeing that we have extensively advertised this camera for the past twelve months, though not in THE BRITISH JOURNAL OF PHOTOGRAPHY, we are somewhat at a loss to understand why your two correspondents should have experienced any difficulty in obtaining such a camera.—We are, yours, &c.,

313, High Holborn, London, March 9, 1900.

[Perhaps "R.N.R." and "A.G.B." will communicate direct with Messrs. Watson & Sons.—EDS.]

RE KODAK V. ELLIOTT.

To the Editors.

GENTLEMEN,—Under the above heading various notices have appeared, and, inasmuch as in some instances the question of identity has been put to us, we beg to say that the action has no reference whatever to us.—

ELLIOTT & SON,

Barnet, March 12, 1900.

COLOUR PHOTOGRAPHY ON LANTERN SLIDES.

To the Editors.

GENTLEMEN,—The lantern slides were only sent as a justification for my statement that I believed that light does impress its colours on the plate, and that it only awaits correct means to prove its power of selection. Considering that the different coloured rays have each its own focus, this seems to me to be a reasonable inference. I see no reason for giving particulars of what is an unfinished experiment, further than to say that the operations were simply developing the negative, fixing and toning the print and all chemicals such as are used at the present time for the purpose.

I confess I should be sorry to see true colour photography become an accomplished fact.—I am, yours, &c.,

W. R. O'HARA (Lieut.-Col.).

West Lodge, Galway, March 10, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

J. Davis, 256, Dalton-road, Barrow-in-Furness.—Three photographs of group of Furness Volunteers for South Africa.

T. N. Langton, 539, Attercliffe-road, Sheffield.—Photograph of Serg. Major Donald Duff. Photograph of the Active Service half Company Hallamshire Rifles.

DAVID JONES.—You would not be likely to obtain such chemicals at a local dealer's. Try some such firm as Hopkin & Williams, Hatton-garden, London, or Harrington & Co., Cork.

KARKL.—1 and 2. The firm does remarkably good work, and that is all we know of them. 3. No; not if opportunity is given the apprentice of acquiring a thorough knowledge of photography.

CLEARING ENLARGEMENTS.—R. COLES says: "Is it necessary, in making bromide enlargements, using metol-hydroquinone developer, to clear the prints with acid, as when the ferrous oxalate is used?"—No. That is one of the great advantages of the newer developer.

PHOTO-LITHO PAPER.—LITHO asks if gelatine-coated paper is to be purchased ready for sensitising, or must the user prepare it for himself?—The paper is sold ready to be sensitised. It may be had from Penrose & Co., Upper Baker-street, W.C.; Winston & Sons, Shoe-lane, and others.

GIACOMO.—It is against our rules to give written information of the nature asked for. We have seen the instrument in use many times, possess some most excellent results produced by it, and believe that its practical value is not exaggerated. You would not go far wrong in purchasing one.

VARNISHES, &c.—M. MERRETT asks "if the alcohol given in the formula for making varnishes (as in the ALMANAC) is generally the ordinary methylated spirits of wine?"—Yes. The ordinary methylated spirit, not "finish," will answer every purpose. Its specific gravity should not be more than about .830.

GUM-BICHROMATE.—E. O. S. sends us a piece of gum-bichromate paper he has prepared, saying that he cannot get a picture upon it, as all the coating comes off in the water, and asks the reason.—The trouble is due to there being far too much pigment in the coating, probably three or four times too much. The light cannot penetrate into the film.

KAURI GUM.—J. ATTWELL writes: "Where can I get some Kauri gum for varnish-making? I have tried at several oil shops, but cannot get it; they don't seem to know what it is, many of them."—We do not know where it is sold in small quantities, but probably some of the oil varnish-makers would let you have some. Try Parsons, Long-acre, or Crease, Cow Cross-street.

ADDRESS WANTED.—E. GOODFELLOW asks "for the address of the manufacturers of small ebonised frames (oval and round) with tiny brass rim inside, used for small circular photographs and miniatures."—The frames are supplied by most of the large dealers in photographic fancy goods, such as Marion's and others. We do not know who are the actual manufacturers of them. They are probably made on the Continent.

DEXTRINE FOR MOUNTING.—P. J. CONNOR writes: "I am, as an amateur, tired of having to mix starch every time I want to mount two or three prints. It has occurred to me that dextrine, which will keep good, when mixed, for a long time, would be far more convenient for the purpose. Is there any objection to its use?"—Dextrine is a convenient mountant, but, as met with in commerce, it is almost invariably acid, and therefore might act injuriously on the photographs.

LENS QUERY.—S. B. A. says: "I have two lenses by the same maker, one a carte, and the other a cabinet. They are both supposed to have the same ratio, but the smaller one seems to give a better exposed negative, with the same time, than the large one, but the negatives do not seem to have the same brilliancy, even with less exposure. They seem flat?"—Probably the black has worn off the inside of the mount of the carte lens; if so, that will account for the difference. Reblack the tube, and see the effect.

OBSCURING GLASS IN STUDIO.—J. & A. S. write: "Last spring and summer we were much troubled with the sun on the roof of the studio, and we expect the same difficulty this year. Can you tell us of anything that will make the glass like ground glass except paint, as that would be difficult to get off for the winter? We do not care to go to the cost of having the present glass replaced by ground."—Make some starch or flour paste, and add some whiting to it, then stipple the glass over with that. This can easily be washed off at the end of the season.

REMOVING SPOTS FROM PRINTS.—A. E. O. asks "the best way to get rid of spots on prints after they have been mounted. The spots in question are caused by dust in the negative or pinhole."—Touch out the pinholes in the negative with water colour, and the white spots, due to dust, on the prints also with water colour.

CAMERA VIGNETTES.—HAYNE. See leading article on another page. Similar results to that forwarded may be obtained by either of the systems described. It was probably done by having a screen the same colour as, or a shade darker than, the background placed between the sitter and the camera. The print is returned as requested.

STUDIO-BUILDING.—X. X. says: "I am about to build a studio at the back of the house. I proposed to build it of wood, covering the opaque portions with zinc. I submitted the plans to the Council, and the surveyor has condemned them. He says that a structure of wood and zinc is not to be allowed, as it is against the bylaws of the Council. What can I do? Is it against the Building Act?"—If it is against the bylaws of the Council, we should not advise you to contest the matter. The better way will be to modify the plans, and bring them in conformity with the regulations. It will save you a deal of bother in the long run.

SPOTS ON PRINTS.—LEICESTER says: "Will you kindly give me your opinion as to cause of enclosed spots all over print? As my customer does not suspect mounts, I have ventured to suggest that it was most probably the bronze printing, which I noticed he has had placed at the bottom of each mount."—The spots may possibly be due to the bronze powder, but the prints generally show signs of fading, as they have turned very yellow. Possibly that may be due to the mounts themselves, or to faulty manipulation on the part of the printer. As you are an analyst, we should advise you to test the mounts to see if they contain any injurious matters.

SITUATION WANTED.—A. D. M. says: "I am twenty years of age, and desire very much to get in a real good studio. I have had working experience of photography since I was thirteen, but not in first-class houses. Could I get a post in some good house to gain more experience at just a living wage, say, 18s. or 1l.? I am a fair retoucher and operator, and fair printer in C.C. and P.O.P., but not much portrait experience in platinum. I have had a good education."—In reply: We can only suggest that our correspondent should try the effect of an advertisement in our outer columns. We may say, however, that his experience hardly strikes us as sufficient to qualify him for a position in a first-class house.

MARKINGS ON A NEGATIVE.—SPOTS says: "I enclose a negative for your inspection, hoping you can advise me as to the cause of the bluish spots on the film of same; also if there is any means of preventing and remedying them. I have had a great many of my negatives spoiled in this manner; no matter what plates I try, it is always the same. In some cases the spots appear a day or so after washing; in others, many weeks. I had printed about fifty prints from the negative I enclose before the spots appeared."—In reply: Owing to insecure packing, the negative arrived smashed to pieces. However, there were left parts large enough to show the spots complained of. These are clearly silver stains. Moisture has been present between negative and paper during printing, hence the stain. The means of prevention are obvious. For the remedy, see the reply to Jakeman and Carver in last week's JOURNAL.

FADED PRINTS.—COLOUR says: "Enclosed I beg to send you two half prints marked A and B respectively. Specimen A shows the normal colour of fresh prints, and specimen B is a print which originally was about the same colour as A, but which has, as you will now notice, turned a chalky colour. I beg to ask whether you would kindly inform me what, in your opinion, is the most probable cause of the prints thus losing colour? I have thought the change is due to a defect in the paper, but the paper manufacturers maintain that the deterioration may be caused by chemical action resulting through a defect in the mounts."—The print has unmistakably faded. That, we should suspect, is due to its not being perfectly fixed and washed. We do not think that either the paper, or the mount, is at fault. Of course, we could not give any definite opinion as regards the mount without actually testing it—that any analyst will do for you if you cannot do it for yourself.

STUDIO-BUILDING.—A. MCHARRIE says: "1. Sketch shows present building as a shop, &c. It is proposed to raise the side walls of top flat, and convert top story into a studio. Seeing it is only twenty-two feet wide—too short for the studio across to suit the north light—what way would you recommend it should be done? Would a ridge roof thus, A, with glass on each side (east and west) or a one slope leaning roof be best, facing east? Would twenty-five be long enough for studio? How much glass should there be above, and at sides, and what height at eaves and top? 2. Would this style of studio be a suitable one, with the sloping roof facing north at far end of building and a gallery of wood for using the camera in to run out from it, thus; if so, please give sizes. What angle should a roof have?"—1. We should prefer the ridge roof with glass on the east and west sides. Twenty-five feet is a little short for a studio for professional work. Three or four feet longer would be more convenient, particularly in taking groups, &c. Have about five to six feet at the background end opaque, both top and sides, and then, say, about ten feet of glass, that is, supposing the studio is the full width of the building. 2. This form of studio is not to be recommended for portraiture, it is better adapted for copying. Bolas' Work on Studio Construction, Marion & Co., will give you much information.

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EX CATHEDRA.

THE new Copyright Bill may at any moment be presented to the House of Lords, but, at the time of writing, it has not been issued by the Queen's Printers. A study of Mr. Bale's paper, however, leads to the supposition that the terms of the Bill will be practically identical with those of the measure brought in last year by Lord Monkswell, which succumbed to an attack of that distressful Parliamentary visitation known as the massacre of the innocents—a fate which, we hope and believe, will overtake the present Bill next August. Last year's Bill was reprinted in the JOURNAL for May 26, 1899; we also give it at page 1008 of the ALMANAC for 1900, so that our readers have two sources from which a knowledge of the text of the measure may be obtained. In connexion with our references to the subject during the past weeks, we understand that the Committee of the Photographic Copyright Union purpose reprinting our remarks of March 2 and March 9, and circulating them in the form of a leaflet amongst photographers. We also learn, from a letter addressed to us by the Hon. Sec. of the Union, that the Committee, at a recent meeting, passed a vote of thanks to THE BRITISH JOURNAL OF

PHOTOGRAPHY for the attitude it has taken with regard to the projected Copyright Bill. This appreciation of our efforts, we need hardly say, causes us the liveliest gratification.

* * *

IN another part of this week's JOURNAL an esteemed correspondent, a professional photographer, quotes figures to prove how hardly compulsory registration, with the attendant necessity of paying a shilling for each photograph it is sought to protect, would press on business men. We can quite conceive of cases where this enforced disbursement of registration fees, as contemplated by the St. John's Wood Bill, would make all the difference, in small businesses, between a tangible profit and a deplorably small one. The promoters of this meanly conceived Bill were probably ignorant of the fact that professional photographers' businesses are chiefly small ones, and cannot stand the financial strain which compulsory registration would put upon them. There would be less room for objection to the compulsory registration clause if all photographs registered within the six months were worth the outlay of a shilling for that purpose; but our readers thoroughly well know that the time specified is a ridiculously short period in which to expect a negative to mature in value.

* * *

LAST week a meeting of the Traill Taylor Memorial Committee was held in London. The business included the election of some members of committee in place of those compulsorily retired. A statement of accounts was submitted by the Honorary Secretary and Treasurer, Mr. Everitt, and this was duly passed by the Committee. The expenses of administering the Memorial Fund are very slight, the cost of the medal and charges for printing and postages constituting practically the whole of the outlay. A sum of over two hundred pounds stands to the credit of the fund. It was decided to ask Mr. Frederic E. Ives to deliver the next lecture in November. If Mr. Ives accepts, as it is hoped he will, his subject will in all probability be colour photography. It will be remembered that previous Memorial lecturers have been Mr. T. R. Dallmeyer, F.R.A.S., who chose "Focometry" for his subject, and Major-General Waterhouse, who read an exhaustive and suggestive paper on "Teachings of the Daguerreotype." To those distinguished

men Mr. Ives would be a worthy successor, and he might be depended upon to make his lecture a valuable and informative one.

* * *

We observe with interest that photographic record work has attracted the sympathetic notice of American photographers. At the Franklin Institute recently it formed the subject of a discussion opened by Professor C. F. Himes, who, after applauding English efforts in this direction, made the excusable statement that the National Photographic Record Association was "recognised by Parliament." Officially speaking, this, we believe, is not the case. Professor Himes suggested that the Franklin Institute, at whose meeting he was speaking, should take up record work, the main purpose of which, in his opinion, should be to make a complete, systematic, practical pictorial record of scientific and industrial facts of the day as they occur. "We make scientific and industrial history as rapidly as civil history, and should be, at least, equally careful for its preservation, for, unless human nature changes, the end of the twentieth century will want to know as much and as minutely about the beginning of it as we do now about that of the century just closing. We must now be satisfied with drawings of that period, often crude, and always limited in numbers; they can expect from us no less than the increased facilities for pictorial representation of to-day entitle them to."

* * *

PROFESSOR HIMES made the further suggestion that provision should be made for stereoscopic pictures in the records. It is not, he pointed out, a question whether most or many persons are accustomed to or even can use the stereoscope, but simply as to whether such pictures have possibilities for representation and record that other pictures have not. Where position in space or form is to be represented, the value of such pictures is too well known to be discussed, but to emphasise the statement he submitted a stereograph of a series of sparks of a Holtz machine. Either single picture presented simply a bundle of interlacing lines; both combined in the stereoscope exhibited lines of definite shape, separated and located in space. So, in a single picture by the Röntgen rays, there is nothing to locate an object, but by two such pictures, stereoscopically related, the object at once assumes its proper position. We certainly agree with Professor Himes that stereoscopic record photographs are to be preferred to monocular productions, and we hope that, if the Franklin Institute takes the suggested work in hand, due provision will be made for this method of handing down to posterity photographic records of things which time and change will not let live. For initiating record work the Franklin Institute has the advantage of great powers of organization, and we shall be interested in watching if the idea takes root in America so firmly as it appears to be doing in this country.

* * *

WE receive each month—and, indeed, always look forward to its appearance on our table—a copy of the *Photographer*, a monthly journal of jottings. This little paper is now in the fifteenth year of its age, and it is issued by Messrs. George Mason & Co., of 120-124, Buchanan-street, Glasgow. In a chatty manner it condenses the month's leading features in practical photography, as they are talked or written about,

and we very often come across little items of interest in the *Photographer* which have escaped our notice in running through our weekly batch of publications, which we number by scores. Mr. George Mason is responsible for the editorial work of our contemporary, the March number of which contains about seventeen pages of catalogue matter, eight of them being set aside for a list of accessories and furniture, lenses, shutters, cameras, and other photographic apparatus included in the spring stock-taking sale.

* * *

THE lack of interest in the work of photographic societies shown by the members is a topic of constant recurrence in Great Britain. Apparently in far-off Madras, where we should have supposed the comparative absence of distracting causes would have conduced to enthusiasm in photographic work, the same trouble exists. The last number of the local Society's *Journal* draws a gloomy picture of the condition of affairs. It states that the Society has a large credit balance at the bankers and a good number of members, but that there is little or no interest shown by the members in the Society. "At the annual meeting, out of fourteen members resident in Madras, only two, in addition to four on the Committee, were present. During the whole of last year the monthly meetings were very poorly attended, and in the month of June there is the following entry in the minute book: "Monthly meeting held June 1899, only two members were present, the President and Honorary Secretary. No meeting was held in consequence." The number of members present at these meetings varied throughout the year from two to seven. During the hot-weather months it is not expected that many will be present, but through this last cold weather the same lack of interest has been shown. It was decided at the meeting held last month to have demonstrations at every monthly meeting, and for this purpose to employ a paid demonstrator and editor. According to the arrangement, post cards were sent to members, informing them that a demonstration on "The Camera" would be given by Major Van-Geyzel, I.M.S. When the evening arrived, however, only four members on the Committee were present, and in consequence no demonstration was given." This is deplorable reading. Generally speaking, the interest of the public in photography is not on the wane, and such lassitude as that shown by the members of the Madras Society is hard to account for.

* * *

THE use of the electric light is so considerable in photography, that it may interest many among our readers to learn of the inclusion in its numerous applications of one for the cure of some of the ills to which the flesh is heir. At a hospital in Chicago there is an electric-light bath, which is essentially a large wooden box, the walls and top of which are lined with mirrors and studded with incandescent lamps. The interior horizontal dimensions of the cabinet are $3\frac{1}{2} \times 4\frac{1}{2}$ feet, with a height of about seven feet. The bottom, side walls, and the ceilings are lined with rectangular plate-glass mirrors, between which are narrow wooden strips with porcelain sockets for the incandescent lamps. In the lower half of the cabinet there are sixty lamps, and in the upper there are thirty-six. The cabinet is carefully insulated to prevent the radiation of heat. The door of the cabinet is in two parts, the lower one being lined with mirrors on the inside, and the top one formed of clear glass. The temperature varies from 110° to 140° F., and

according to the source of our information, the electric light bath is used for the treatment of nervous diseases, Bright's Disease, and fatty degeneration of the heart. There are only two similar baths in the United States. The interest attaching to the matter would be increased if it could be clearly stated how the rays from electrical incandescence operated in curing such a great variety of diseases.

THE USE OF MIRRORS IN PHOTOGRAPHY.

In many instances in photography, owing to the peculiar nature of the subject, much may be done with the aid of mirrors to produce satisfactory results that otherwise would be almost impossible of accomplishment. A very general belief exists that mirrors are only of use in instances where a certain class of negatives is required for one or other of our photo-mechanical processes. No doubt, they are of great assistance to the process worker, and any one desirous of making direct reversed negatives for single transfer carbon work, but they cover a much wider field in the hands of an all-round photographer.

It is well known that exception has been taken to the use of any ordinary mirrors in photography, simply by reason of the fact that a mirror silvered at the back like we find all ordinary glass mirrors to be in common households, is certain to yield double images, one of these images being yielded by the silver surface of the back, and the other from the plain surface of the glass; hence, for the purposes of photography, specially constructed mirrors are employed; these may be of what is termed a double-surface form—that is, both the back and the front of the glass are silvered, though why such an expedient as silvering both surfaces should be resorted to it is difficult to see, for in reality only one surface is actually required. All surface-silvered mirrors are delicate tools to handle and work with, and, when they get out of order, they are liable to give trouble when used for photography.

Although it is quite true that an ordinary household mirror, which is merely silvered at the back, is liable to yield double images, these old-fashioned forms of mirrors were employed with much success many years ago—in fact, long before the advent of gratings in process negative-making, and it may surprise some of our modern workers to be told that no less an authority than the late J. Traill Taylor specially advocated their employment in portraiture, pointing out that, in many instances where this class of photography was being conducted in such situations as private rooms and the like, the system of working by reflection was greatly superior to a direct method of lighting. When using a mirror for this kind of work, it is pointed out that the double image of a person in front of a mirror is only visible when the angle composed of the incident and reflected ray is obtuse, and that such a condition need not be in force when using a mirror for taking a portrait in an ordinary sitting room.

We believe it was the late Mr. J. Traill Taylor who first drew attention to the means whereby an ordinary mirror could be employed for portraiture without yielding any double image, and, if we mistake not, his method of using a common mirror was very simple, and consisted in placing it upon a table close to any ordinary window and then arranging the sitter about a yard from it, and so seated as to present to the observer's eye a perfect profile. If such an image is very carefully inspected, the observer keeping so near the sitter as just

affords an uninterrupted view of the mirror, a solid image without any appearance of doubling will be apparent, and, when a camera is brought upon the scene, and a plate exposed in the ordinary way, the negative of the reflected figure, even when examined by a magnifying glass, will show nothing wrong. Of course, negatives produced in this manner are reversed, but, in many instances this is desirable, especially, as pointed out, for carbon printing.

There are certainly numerous instances where an ordinary household mirror would not by any means be the most useful to employ by reason of having to so pose the article as to show particular portions or points of the object. Large mirrors, specially prepared for photographic purposes, then become very expensive tools to acquire, and, no doubt, but few of the ordinary run of amateurs would be found willing to incur the cost of same. There is, however, another expedient, viz., the employment of black mirrors, and these any one can, with a little trouble, so rig up himself as to enable a very large field of operations being conducted. In floral photography, for instance, they are invaluable, and it is, perhaps, letting the cat out of the bag to make public their use in this particular class of photography, for it is just one of the good things that some of the old practical workers have managed to keep up their sleeves. Then, again, in cloud photography, the employment of a black mirror for this purpose will come as a revelation to those who have never seen the beautiful effects of the sky as reflected from the surface of a black mirror, and the ease with which splendid negatives are obtained of them. Of the innumerable classes of articles which are specially amenable to treatment by means of a mirror there is no need to speak particularly, suffice it to say that such articles as caskets, vases, and inlaid work of every description are at times only possible of being photographed by the aid of a mirror, and instances will be met with, such as where an open book has to be photographed lying flat, or nearly so, and in which all the printed matter has to be reproduced so as to be easily readable, in which, were it not for employing a mirror, it would be almost impossible.

Process workers know the immense advantages conferred by a good mirror, and, probably owing to such working, so that a wider angle can be transmitted therewith than is possible with prisms, generally prefer them on that account.

To the great body of amateur workers, however, the use of mirrors in photography may be said to be unknown, and, doubtless, the cost of a really perfect mirror, as supplied for high-class process work, would deter many from adopting them in their work. This latter objection, however, need not prevent any enthusiast from undertaking much interesting work, even among the class of subjects, such as clouds and floral photography, previously referred to, for a serviceable mirror may be made by any one without incurring much expense, after the following plan:—

In providing a mirror, it stands to reason the surface of the glass employed must not only be free from flaws, but likewise, if perfect definition is to be acquired in photographing by its means, its surface must be absolutely flat. To obtain this, there is no necessity for any one who merely intends experimenting in such as cloud photography, and on other subjects where extreme fineness of definition is not required, going to the expense of having a large sheet of glass specially ground and polished, for in most households or second-hand furniture shops an old mirror can generally be found, the

surface of which is quite true enough and free from flaws, which, on removing the silver compound from the back, by means of dilute nitric acid and a coarse or woollen cloth, will permit of its being converted into a very serviceable black mirror. To do which, on the back surface being rendered free from any silver deposit, let it be carefully coated with Bates's black varnish or a good sample of Brunswick black, which will produce a very serviceable article.

In using mirrors of this description, unlike those in which the back is coated with silver, the active reflection would appear to be from the front surface of the glass only, the light on passing through to the back becoming absorbed by the dark pigment, so that there is no trouble as a rule from double images when such mirrors are employed. The exposure to a sensitive plate, when some subjects of a non-actinic colour are being photographed, may require to be considerably longer with a black mirror than would be the case with an ordinary silver mirror, but the most perfect definition is capable of attainment. When dealing, however, with light objects, such as clouds, &c., the exposure, even with the black mirror, becomes very rapid.

Flower studies in every variety of colour are most beautifully rendered, and to those who have never experimented in this special branch of photography there lies a wide field for delightful occupation and study.

In using a mirror of any description, of course, the resulting negatives are reversed. Professionals, of course, easily overcome this difficulty, but to the general run of amateurs the printing of such negatives by means of carbon is, in point of fact, most desirable, and, should any one unacquainted with this delightful process of printing take to it, he will never regret doing so, for it is certainly one of the most beautiful and permanent processes we possess.



Home-made Papier Mâché.—Long before the days of the popularity of celluloid, *papier mâché* had a reputation, and was of much use in photography for, among other things, the marking of dishes, &c., at once light, durable, and, when well japanned, impervious to water. *Papier mâché* in bulk is an excellent material for repairing and filling in cracks in utensils, repairing woodwork, and, on occasion, forming a substitute for wood for small articles; it is lighter than wood, and as plastic as clay. It is easy to make, may be kept in a damp place, or covered with wet blotting-paper for several days. An ounce of paper torn into shreds (old newspapers will answer) is soaked in hot water for some hours, and stirred about with the hand till it forms a perfect pulp; the water is squeezed out till the mass of pulp weighs about a quarter of a pound, then add to it half of a quarter of a pint of hot glue, and work all well together. To this add and well amalgamate about three or four ounces of plaster of Paris. The mass will stiffen in a little while, and must be kept well worked till homogeneous, and another quantity of hot glue added equal in quantity to the first, and the whole vigorously mingled. It must then be tried as to its consistency; a little pressed with the thumb on to a smooth board should stick closely; if it does not, add a little more glue; it must be sticky. If it should be too lumpy, or get hard before use, it may be hammered into proper consistence again.

Becquerel Rays.—The study of bodies emitting rays somewhat similar to Röntgen radiations, and termed, after their first investigator, Becquerel rays, continues to excite much interest. We have on several occasions brought before our readers accounts of the work done by M. and Mme. Curie, and there have recently been read at the Paris Academy papers by these investigators, and by M. Eugène Demarcay and M. Becquerel himself. The latter chemist

obtained some nitrate of polonium, the new radio-active metal, and found that, when excited by a magnet, the effects, as exhibited on a photographic plate, were almost the opposite of those obtained with radium, another of the Curie's discoveries. M. Becquerel finds the radium rays resemble the cathode rays to a certain extent, but not entirely. Thorium also has been found to be radio-active, more so than the metal uranium itself, though less so than radium and polonium. These substances all render the platino-cyanide screen fluorescent, though less so than the Röntgen rays.

The Action of Gelatine on Copper.—A very curious reaction between gelatine and copper is described in the *Journal of the Russian Chemical Society*, which may possibly be proved to have a bearing on the copper process of toning bromide prints. Mr. Alexander P. Lidoff, in the course of some experiments in another direction, discovered that an alkaline solution of gelatine, after acting upon a piece of copper fringe placed on it, had taken up 354 per cent. of copper. It is thus possible that in Mr. Fergusson's process the copper once deposited may be held by the gelatine itself in combination as well as by virtue of its simple precipitation or substitution.

The Purification of Water.—Permanganate of potassium is well known for its use for this purpose, the retention of the pink colouration being a sign of the precipitation of the organic matter originally present. The drawback to the process is the fact that concurrently with the precipitation of the manganese is the liberation of the alkali of the salt in it of calcium or potassium. M. A. Tixier, in the French *Journal of Pharmacy*, proposes to get rid of this defect by the use of a mixture of aluminium and of barium permanganates in solution. The solution he used at a strength of 35° B., which contained 290 grains of permanganic acid per litre, and 7 per cent. of alumina. It is added to the water to be purified till a permanent pink colour is produced. After standing for twenty-four hours, it is fit for use, when passed through a carbon or other filter.

Albumen and Gelatine.—At one time in the history of photography the exact composition of albumen formed a subject of perennial interest, and it was attempted to be shown by some writers that the want of permanency in albumenised paper prints was due to the sulphur which formed an integral part of the albumen, as shown by analysis. The advent of gelatine was hailed as getting rid of this source of danger; but such could not be the case. Take, for example, some recent examinations of gelatine by Herr Carl Thore Mörner; he finds it to contain 0.2 per cent. of sulphur present in the gelatine, but not as an impurity. With regard to albumen, Herr A. A. Panormoff finds it by no means the definite chemical compound that some have believed it to be. He states that different birds' eggs contain different kinds of albumen, and he proposes to name each egg albumen according to its characteristics. Thus hen egg albumen easily crystallised from ammonium sulphate solution he proposes to term albumin, and the more soluble albumen albuminin. In other cases, to the form which is least soluble in the ammonium sulphate solution he gives a name which is formed by adding the termination "in" to the zoological name of the bird, the more soluble albumens being similarly designated by words ending in "inin" and "inidin" in the order of increasing solubility. Thus the amorphous albumen of pigeon's egg is columbin, and the more soluble crystalline albumen is columbinin.

Cloud Negatives.—About the time of the equinoxes—vernal and autumnal—there is usually to be seen a greater variety of cloud effects than at any other period of the year. Therefore the present is an excellent time for securing a stock of cloud negatives for future use. Why we call special attention to this subject just now is that probably many outdoor workers have by them some unexposed plates, left over from last season, that they would not care to risk the use of in the field or far from home. Now, such plates,

though they may have somewhat deteriorated by keeping, may well be utilised for taking stock cloud negatives upon. In fact, in the majority of cases they will answer quite as well for this purpose as freshly made ones. Hence our timely hint that supposed useless plates may be put to a profitable use.

JOTTINGS.

It is many years since the late Mortimer Collins charmed us with his musical "Summer Song," drawing his inspiration from the sparkling life of the Upper Thames as it is lived when the days are long and sunny and the river is fringed with the greenest and leafiest ribbons from Nature's loom. A scrap from one of the verses—

"Pleasant it is in a boat to glide
On a river whose ripples to ocean haste,
With indolent fingers fretting the tide,
And an indolent arm round a darling waist,"

was jingling through my head a week or two back when I spent an afternoon taking photographs of the flooded river near our village. But it was neither the time nor the place for the interesting sentimentalisms of which Mortimer Collins so neatly sings. Under grey skies and flanked by bare, black trees, the swollen river raced down between the locks, and at the weirs there was a sullen roar such as might have come from the beat of the angry seas on a rock-bound coast in winter. The Thames was out for miles, and the flood mark of 1894 stood not more than a few inches from the face of the violent stream. The one or two boats I saw out did not glide along, they were simply swept down the river, and their occupants had other work to do than fretting the tide with their fingers or curling their arms round ladies' waists. The Thames in full flood gives no opportunities for the gentle philanderings that are permissible in June, when, to again quote Mortimer Collins (who, by the way, was one of the most polished writers of *vers de société* of his time),

"The river's swift ripples flow tardier far"
than in flood time.

BUT now the river has fallen to its normal level, and steals lazily under the bridge without boiling into fresh-water foam as it meets the arches. Faint spots of pale green are seen on the dark branches of the trees, and in the backwaters busy hands are furbishing up the house boats. Spring is near. The floods and the vast lakes which covered miles of the flat land have gone, but my photographs remain to remind me of the thorough-going and remorseless manner in which the risen waters efface landmarks that are of daily interest and importance to the surrounding population. Submerged towing paths; main roads cut off for leagues; dwelling-houses, familiar hostelleries, and snug farm-houses formed into the geographical expressions of islands, and approachable only by express punt; wayside meadows converted into sailing lakes; trees and other objects sticking up here and there, apparently out of limitless sheets of glass—these and many other phenomena gave one the chance of making photographs of the Thames in aspects not familiar to the summer visitor. Opportunist work in photography is always exciting and interesting, and I must say that I enjoyed the little task of making a few exposures on these flood subjects. The time may come when the Thames near our village will never be flooded, for, a mile or two above us, an enormous reservoir and eight miles of aqueduct are being constructed, so that the inhabitants of East London may always have a plentiful supply of drinking water drawn from the Thames. If those thirsty people take all our flood water, my photographs will be additionally interesting to me, and will constitute an imperishable record of the last of the local inundations. But it remains to be ascertained if the aqueduct "intake" would diminish to a measurable extent the heavy floods which the Upper Thames has just felt.

THE word "record" in the preceding paragraph reminds me of a note I made to mention a little point that occurred to me in connexion with the National Photographic Record Association. There

is no question that, under the enthusiastic guidance of Sir Benjamin Stone, good and useful work is being done in collecting photographs of historical buildings and other subjects, which students of the next century may be glad to inspect at the British Museum. It would be a pity if that work were not assured of continuance, for, as time goes on, the effacing hand of the public improver seems to move with increasing power and celerity, and landmarks disappear with a rapidity that is shocking to those who look with a reverential eye on the material manifestations of age or antiquity. As a case in point, the many thousands of readers of this JOURNAL who visited its old office in York-street, Covent Garden, between the years 1864 and 1898, may be interested to know that the street has been continued across Catherine-street into Drury-lane by the simple plan of demolishing all the houses between those two thoroughfares. The work has been in progress some time, but it seemed to be completed in a night. So, distant readers of Dickens's *Bleak House* should be concerned to learn that the burial ground where "Jo" pointed out to the veiled Lady Dedlock the grave of his benefactor ("E was very good to me, 'e wos") has been replaced by the smooth wooden pavement of a new street, which virtually starts at the old office of the JOURNAL.

SUCH are the changes that are made in the noiseless flight of time! To return to the National Photographic Record Association: In the interest of the work which it has in hand, it is desirable to know if the Association is really an association in anything more than name. Are its members made by election, and is the executive constitutionally chosen? Have arrangements been provided for continuity of administration? What is the subscription to the Association? Where are its offices? Failing Sir Benjamin Stone and Mr. Scamell, who will carry on the work? I ask these questions in no hostile spirit, but because I feel that upon the answers that can be given to them hinges the vital matter of the Association's future. If it is a constitutionally organized body, and continuity of existence and management have been assured, well and good; if not, the sooner matters are put on such a basis the better for the continued success of the scheme to further "record" photography. Some years ago there was a very good society for photographing ancient buildings, but it quietly and unobservedly dropped out of existence, mainly, I fear, because of the imperfections of its constitution. I do not wish to see such a fate overtake the National Photographic Record Association, and that is why I am directing attention to the matter.

MY keenness on photographic record work this month is, no doubt, due to the glamour of the historical associations with which I may describe myself as being now in permanent touch, and amidst which much of my photographic work is necessarily done. For, across the moor that bounds our village, the proud towers of Windsor (never so proud as now!) soar above the tree-tops, and in the immediate foreground the eye falls on the old house which includes some parts of the original mansion in which King John slept the night before he signed *Magna Charta*. Almost within stone's throw of this house lies the quiet mead on which he met the grim company of Barons who were to wring from an unwilling monarch some of the most cherished liberties of our race. And, if these beautiful prospects do not suffice to stimulate the mind to carry itself back to the remote and stirring past, a turn of the head will lead the gaze to an old grey stone on the river's bank which bears these words: "The ancient stone above the inscription is raised upon this pedestal exactly over the spot where it formerly stood, inscribed 'God preserve ye City of London.' 1285." From mediaevalism and the middle ages, to which these dates and scenes waft you back in imagination, it needs some very powerful agency—such as the prosaic-looking camera at your side—to recall you. For nothing is so soothing to the tired mind as to turn back the hand of time a few centuries, and live a while amongst the silent ghosts of the dusty, shadowy past.

TONING formulae for developed bromide prints have been plentiful enough these last fourteen years, but few of them have survived the test of constant practice. Uranium, with which at one time I

made many experiments, gives a pleasing range of red and brown colours, but the deposit is not sufficiently stable to resist atmospheric and other influences. The image, in fact, is very prone to fade or change colour. I have not tried Mr. Fergusson's plan of toning the picture with a copper compound, as described in the JOURNAL of Jan. 12 (p. 30); but, chemically regarded, it seems to be one that should give a reasonably permanent deposit. I have seen some very effectively toned prints produced by this method. At the Birmingham Exhibition one of Mr. Wellington's admired Leaderesque landscapes, having a "standard brown carbon" colour, was toned according to Mr. Fergusson's plan, and I have rarely seen a bromide print more artistically tinted. When so able a worker as Mr. Wellington speaks in terms of approval of copper toning, photographers generally may take it that there is "something in it," and I therefore recommend my readers to follow so excellent a lead.

LADYSMITH DAY, March 1, is, I suppose, burnt deeply into the minds of all of us. There are many things by which I shall always remember the day, for it was full of notable happenings. While the loyal tumult was rising in the streets, I spent an hour or so studying Mr. Craig Annan's delightful photographs in Russell-square, in company with two of the most distinguished portrait photographers of the time. A *verbatim* report of the comments made on Mr. Annan's work would, no doubt, make good reading. Such things, however, are not to be. What I wish more particularly to refer to here was the fact that one of my friends, who admittedly stands at the head of his profession, passed all the time he could spare in London at the picture galleries studying the masterpieces of portraiture, ancient and modern. If I wrote a thick book, I do not think I could give the young portrait photographer, anxious to succeed and produce good work, a more valuable hint than this, namely, to constantly seek inspiration from great paintings. Going from one subject to another, I am glad to hear that, in June, we are to have, at 66 Russell-square, a one-man show of Dr. Emerson's masterly photographs. These beautiful works, so full of the placid charm which distinguishes East Anglian life and landscape, will, I am sure, come as a revelation to many who only know a great photographer, and one of the most gifted of men, through the medium of his books, which, in themselves, have assured their author an imperishable reputation.

COSMOS.

AMERICAN PHOTOGRAPHIC CRITICISM.

MR. F. HOLLAND DAY, whose photographic work, in most parts admirable, is much appreciated in this country, supplies Mr. Sadakichi Hartmann with an opportunity of contributing to the March number of the *Photographic Times* (New York), a highly laudatory criticism, some extracts from which may interest those of our readers who are unaware of the extreme lengths to which this sort of thing is just now being carried in the United States. Mr. Day's portraits, according to his admirer, are "plastic psychological syntheses of the persons represented." But the article is crowded with many other equally good things, probably seriously written—and seriously taken in Boston and New York. Says Mr. Hartmann :—

"Mr. F. H. Day's photographic art is an art full of delicacy, refinement, and subtlety, an art full of deep thought and charm, full of dreamy fascinations. This is as much as to say that it is not the kind of work to please everybody. It appeals rather to the intellectual and the refined—to those, in a word, who can understand and can feel—such as those who love and appreciate Mr. Day's work; their support is enough to establish an artist's reputation, and that in a manner far preferable to the notoriety achieved by much of the transient, garish work of the day. I know of no photographer who can drape a figure more pictorially or adorn a man's or a woman's hair with flowers in a more picturesque manner. He has proved in a rapid succession of admirable pictures what possibilities lie in decoration. His decorative feeling, however, is not complete in itself or affected by nothing beyond itself. It is dependent on many external incongruities, as dramatic effect, poetical sentimentalism, æsthetic emotion, and at times even commonplace story-telling.

"He strives to render our modern life more harmonious. No easy task, truly, in this age of ours, when everything tends towards the effacement of character, when uniformity of dress is almost universal, when the levelling of the classes is every day causing our personality to disappear more and more. A risky task, too, and one requiring a rare gift

of perception for its thorough accomplishment; for it is really a fine and fertile subject of study for an artist, conscious of his mission—an age like our own, full of elegancies and refinements of every kind, and instilled with a feverish activity, throbbing perpetually throughout the civilised world, with its thirst for the joys of the moment, its love of pleasure and luxury, its craving for a life crowded with the greatest possible variety of sensations. Mere talent for arrangement does not suffice, and neither does it suffice Mr. Day. He is a psychologist, ever on the alert, ever seeking for this—to grasp and to express in material form the individual characteristics of his subject. What do I care for the blood flowing beneath the skin, for the network of swelling and throbbing veins? What matters the sight of the straining muscles full of life, if the invisible part, the mystery of this living being, be absent from the picture, if I cannot enter into communication with its spirit? I care not how brightly, how truly, the eyes may shine, if I know nothing of the thought, the fancy, animating them. Even a flatness, or the projection of a bone, or the irregularity of a line, a deformity even, gives evidence of some habitual trait which, if at times contradictory, is, nevertheless, always full of interest.

"As I said before, Mr. Day's art is one of delicacy and subtle refinement. To prove this, examine carefully the figures he so delights in. His subjects are intensely alike with the inner life, they seem heedless of all that might tear them from their own secret dreamings. They make no attempt at futile agitation, but are content with the thoughtful gestures of repose, the special poses and attitudes of pensive grace, in which the artist has fixed them. Look, for instance, at his portrait of Miss Ben Yusuf. How well he has caught her habit, her ordinary way of being, 'all her little ways.' One feels at once that the artist has photographed her with his heart, if such a thing can be said. The portrait thus conceived becomes a plastic psychological synthesis of the person represented." [According to the published reproduction, this is a very ordinary photograph of a tastefully dressed young lady leaning against the door of a room.—EDS. B. J. P.]

"We find that all his scrupulously studied figure compositions have a setting of their own and a special atmosphere. Mr. Day will have none of that strict exactitude the importance of which is so greatly exaggerated by most photographers. Imagination has too strong a hold on him for that; hence the air of harmony pervading his pictures—a skilful harmony, perhaps somewhat pedantic and affected at times, but generally deep and concentrated, substantial and mellow, expressing exactly what he wishes to express, adding merely enough to transfigure, magnify, and generalise reality.

"The decorative side of Mr. Day's work can, in my estimation, be hardly overvalued. It is this which impels him to those subtle effects of light and shade, and those surprising arrangements of costumes and accessories, giving to each of his figures just those surroundings which are proper to that particular subject, which give such an irresistible charm.

"Mr. Day is fond of strange and wayward fancies. He likes to strike rich chords, but muffled, as it were, by the mist of his dreams. What delicate poems can be found among his studies after the nude—those graceful, youthful forms showing in calm repose on a background of some idyllic landscape! They appear in the twilight air, in which he likes to envelop them, like lovely figures of the past, telling of glories that have faded long ago. They are nearly always broad in treatment, without a trace of coarseness.

"He has always lived the life of an æsthetic, who appears to all, at the first glance, as an extraordinary extravagant personality, one that excites immediate curiosity. Strange stories, both astonishing and ridiculous, are told about him, and he in no way objects to them. In serious dignity, he applies more of his imagination, for instance, to his mounting of prints than to his artistic productions themselves. To pose is a necessity to him, as it is only when he believes himself something out of the ordinary that he can accomplish good work, which is always an endeavour to realise something out of the ordinary.

"Many anecdotes are circulated about him. Once a stranger visited him, and, knocking at the door, heard a most cheerful 'come in,' but, entering, found to his great astonishment nobody present. He looked around everywhere, but could find no trace of Mr. Day; then suddenly he heard a clucking sound, he looked up and saw Mr. Day sitting on a shelf right under the ceiling, wrapped in an Oriental costume, smoking a water pipe! There exist also dozens of variations of the curious theme, how he made his 'Christ studies.' He left Boston with a whole troop of male and female models, accompanied by a waggon load of costumes, a wooden cross, and other paraphernalia, for some secluded country spot in the vicinity of the modern Athens. Out there he went

at once to work, had the cross erected on the top of that hill, built a sepulchre, and prepared for a long stay. Then began the rehearsing of his company, and the sacred tragedy was played more than a hundred times on the top of that hill, while curious farmers on their wagons with their entire families, came from far and near to gaze at the strange spectacle. There is still some doubt in the profession whether he posed himself for the Saviour or not."

We hope Mr. Holland Day's head will not be turned by the extravagant praise to which he is subjected in the foregoing appreciation. Great praise is undoubtedly due to him for the daring and unconventional photographs he produces with such persistence and ability, but the qualities "read in" to them by his gushing admirer are not obvious to persons of less excited imaginations, so that it is probable Mr. Hartmann's florid exaggerations may have the effect of attracting no inconsiderable amount of ridicule as well as sympathetic curiosity towards the photographic work of Mr. Day.

PUBLIC ART CONGRESS AND EXHIBITION—PARIS, 1900.

THE city of Paris, through its Municipal Council, has undertaken the organization of the Second International Congress of Public Art. An International Exhibition of corresponding works of Public Art is organized in connexion with the Congress. The Exhibition will be open, at least, during the months of July and August; the sessions of the Congress will be held during the first part of August.

The programme of the Congress comprises those questions which deal with the creation and protection of the artistic aspect of cities and the beauty of country sites. These questions are divided into three series:—

1. Historical Questions.—Concerning the preservation, restoration, mutilation, or destruction (a) of groups of public buildings created in ancient, modern, and contemporary periods with a view to the artistic aspect of cities; (b) of groups of monuments, edifices, works of art, gardens, plantations of trees, &c., which contribute to make up the artistic aspect; (c) of country sites universally admired for the beauty of the works of nature, and consecrated by history, legends, and the habits of the people.

2. Technical Questions.—Concerning the principles of aesthetics applied to cities, the conditions of such application, the processes of preserving and restoring the exterior parts of monuments, edifices, houses, decorative works of painting and sculpture, &c.

3. Administrative Questions.—Concerning laws, regulations, and all other administrative means for creating and protecting the artistic aspect of cities and the beauty of country sites.

The Exhibition will have the same general divisions as the Congress. The Historical Section will exhibit, by means of reductions in relief, drawings, paintings, and photographs, the more interesting examples of preservation, restoration, mutilation, and destruction of entire groups of public buildings, places, and city streets, which present an artistic aspect, and country sites renowned for their beauty. Such examples, so far as possible, should be accompanied by parallel representations of the state of the groups before and after their restoration, mutilation, or destruction. The Organizing Committee especially invites municipalities and associations to have drawn up for this section graphic maps and tableaux, showing the results of their action or the progress of vandalism in their city and country.

The Technical Section will exhibit, in the same manner, the best types of ancient, modern, and contemporary application of the principles of aesthetics to cities: monuments, houses, statues, fountains, stands, public clocks, posters, signs, lamps, gratings, tree, shrub and flower plantations, squares and gardens, specimens of the various processes for preserving and restoring the exterior parts of monuments, houses, and decorative works of painting and sculpture.

The Administrative Section will exhibit various documents, laws, decisions, regulations relating to the creation and protection of the artistic aspect of cities and the beauty of country sites; publications, reviews, journals, and books in which the questions of the programme of the Congress are treated; and, either by the original or in reproduction, posters, placards, notices, &c., and all other curious documents—ancient, modern, and contemporary—relating to the public supervision and protection of monuments, public art works, inscriptions of highways, public places and monuments, &c., which may be found in archives, libraries, museums, and private collections.

The Secretary of the Congress, to whom communications should be addressed, is M. Marius Vachon, Hôtel-de-Ville, Paris.

EXPOSURE: THE WATKINS SYSTEM.

At the meeting of the Doncaster Camera Club on March 12, a lecture on "Exposure: the Watkins System" was read by the President of the Club, Mr. G. T. B. Woodley.

The lecturer commenced by explaining that four influences govern exposure, which are subject to variation, viz., Speed of Plate, Opening of Lens, Subject, and Light, and the reason why such a thing as correct exposure was necessary lay in the limitations of the sensitive plate.

If a plate were exposed in different parts to varying amounts of light, a scale of varying densities would be obtained, and for a plate to be correctly exposed the highest light must not make a greater impression on the plate than the minimum indicated, otherwise the familiar grey appearance of over-exposure would result. On the other hand, the exposure must be sufficient for the darker details of the subject to make some impression, or the familiar "clear glass in shadow" of under-exposure would be evident. The quality of a plate depends upon the distance between the minimum and maximum range of exposure, and not upon the speed; a poor-quality plate permits of very little variation in exposure without getting under or over-exposure.

In 1873 Vogel (followed later by Scott, Hurter & Drifford, and others) brought out tables of rough estimates of the value of light at different hours of the day and at different seasons of the year. In 1887 Burton published rough estimates of exposure required for different subjects; these two tables were practically the base of all the slide calculators such as (Ilford, Actinograph, Cadet's, Phillips, &c.) on the market. With these calculators the variation of the light from the average has to be estimated by the human eye, which is notoriously ill adapted for the purpose.

Actinometers had been used by a few advanced photographers for many years, from which the relative value of light is ascertained by the time a strip of sensitive paper takes to darken to a standard tint, and, since Abney adopted bromide paper instead of chloride paper for these instruments, their readings had been reliable even in comparing the dim light of an interior with the bright sunshine outside.

Mr. Watkins invented his exposure meter in 1890, and several attempts had been made prior to this time to utilise the reading of the actinometer by the aid of slide rules; but the mistake had been made of using Burton's subject classification, and although the outdoor light was tested by actinometer, any variation for woods, interiors, &c., became a matter of estimation. By the Watkins system the light actually falling on the subject is tested, the system is therefore essentially different from the older methods and does not use the same tables.

Of the factors named, only light, plate, and diaphragm need be considered in most cases; it is only when the reflecting capacity of the subject varies largely that subject need be considered.

The audience were here reminded that, although plates by two different makers might be marked with exactly the same H & D speed numbers, the speed of the plates might be different, owing to want of uniformity in the standard of light and developer used by the makers; Mr. Watkins therefore tests all plates monthly or oftener, and issues a "speed card" suitable for use with his meters.

The actinometer takes into consideration all classes of lighting and makes allowance for light obstructed in any way, as the sensitive paper is only acted upon by the light actually falling upon it; this is why street scenes (being bounded on each side by high buildings) do not receive so much light as an open landscape, and therefore require longer exposure. In tables, a variation of at least 1 to 100 would have to be estimated by the eye alone.

All objects of an average colour, such as those met with in every-day life, were classified under one subject number, and it was only in cases of exceptional variation in reflecting capacity of the subject, such as in sky, sea, or white objects—snow, or very dark or non-actinic objects—that variation need be made in the subject number.

Distance makes no difference in exposure except when the subject is so close as to necessitate the extension of the camera more than usual, thereby altering the focal value of the diaphragm, or when (as frequently happens in this country) the atmosphere is charged with haze, which reflects a large amount of light on the subject.

The lecturer showed the advantage of the slide-rule system combined with the actinometer, and explained that, when once the instrument is set for plate and stop, the exposure can be read off against the actinometer time without further setting. Although apparently complicated, he considered the original system of having a separate pointer for each factor was the simplest in the end, as each value is marked down with the pointer as found, and when plate and diaphragm values are set they often remain unaltered through a day's work.

In photographing interior work he had introduced the system of exposing the meter at the same time as the plate, inserting such a stop in the lens as would make the camera exposure equal to the tinting of the actinometer to the standard tint. This should be further amplified by the use of a tint which takes only one-quarter the standard time to tint, and still further by observing that the actinometer paper commences to show signs of darkening exactly in one-sixteenth of the time required to colour to the standard tint, thus larger stops and quicker plates might be used by adopting either of these modified methods for interior work.

In pinhole work the system was equally applicable, as Mr. Watkins had published in his exposure book comparative values of different-sized needle holes with ordinary diaphragm numbers; therefore, if a No. 10 needle were used, and the opening named *f*-35, the pinhole was sixty times less than the actual diaphragm, *f*-35, and required one minute instead of one second, which would be indicated on the meter for *f*-35.

In hand-camera work the lecturer had found great comfort and convenience resulting from the use of the hand-camera calculator, which told him that views under trees were capable of a snap-shot exposure when the eye decided that they were not; it was also useful in well-lighted places for determining the proper speed of shutter for any particular stop.

In conclusion, the lecturer remarks that he only dealt with the tools of our science, and, because a man uses over or under-exposure to obtain a particular artistic effect, let him not despise methods giving a definite standard, which he may follow or not as the mood seizes him.

The lecture was illustrated in a very complete and interesting manner by a number of slides, and was greatly appreciated by the members present.

PER-SALTS AS REDUCERS.

[Translated from the *Bull. de la Soc. Franc. de Photographie*.]

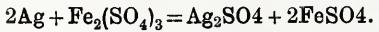
In reducing negatives, an effect the opposite of that produced by persulphate of ammonium is sometimes desired, *i.e.*, an increase in the contrasts. This is, indeed, the effect most usually obtained when plates or paper prints are reduced, and it is of particular service when an over-exposed and over-developed negative is in question. Reducers commonly used may be divided into two classes, according to their capability of acting in one or two solutions. Those of the second class consist of one solution which converts the silver into a compound soluble in thiosulphate of soda, and of another consisting of the fixing bath, precipitation, or other chemical reactions, preventing the incorporation of the two reagents in a single solution. Such is the copper chloride and thiosulphate reducer.

The first class includes those in which this oxidising agent and the solvent of the product of its action can be kept in one and the same solution. Such is Farmer's reducer of ferricyanide of potassium and thiosulphate.

The two-solution process is less convenient in practice, because the progress of reduction cannot be watched; and, although Farmer's reducer possesses distinct advantages over copper chloride, the facts that the mixed solution acts irregularly unless kept constantly in motion, and, moreover, soon loses its reducing power, are against it. The former fact—its irregular action—prevents the course of the reduction being readily watched, because every time the negative is removed from the bath the solution must be washed off, or markings will appear.

We have therefore made a number of experiments with a view to obtaining a single-solution reducer, and commenced the examination of a number of per-salts of various metals.

Ferric Salts.—Ferric salts, especially the nitrate and sulphate, act as oxidisers of the silver film in neutral solution, according to the equation—



But this reaction cannot be applied in practice, for the reason that the negatives treated with it acquire a deposit of oxide of iron or insoluble basic salt when they are washed to remove the excess of iron salt, and the gelatine, although transparent, remains stained light yellow. We found that this defect of the reducer could be remedied or avoided by the use of a bath of weak acid—such as an organic acid—after reduction or by adding citric acid or citrate or lactate of ammonia to the ferric solution, but this addition, besides complicating the process, introduces a serious disadvantage—the colour of the silver image changes during reduction, and takes on a yellow tint distinctly different from its original colour.

We have made comparative tests on a series of other per-salts, of which the following is an account:—

Salt of Manganese Peroxide.—We examined the action of those salts of peroxide of manganese which can be dissolved in water and can be kept without alteration. Only certain salts of organic acids possess these properties. We prepared these compounds by the action of aqueous

solutions of the various acids or a strong solution of potassium permanganate. Hydrated peroxide of manganese is precipitated, and dissolves in an excess of the cold solution of the acid. The brown solutions thus obtained with citric, tartaric, and lactic acids reduce the image, but the solutions do not keep unchanged, and, further, stain the gelatine yellow and alter the colour of the silver deposit. They do not, therefore, possess much practical interest as reducers.

Salt of Peroxide of Titanium.—When titanic acid, T_2O_5 , is treated with hydrogen peroxide, titanium peroxide, NO_3 , is produced, which is soluble in various acid solutions forming the salts of peroxide of titanium. Those salts, the acids of which form soluble silver salts, act more or less as reducers. Among these, titanium sulphate acts fairly energetically as a reducer.

Its action is rather curious. The gelatine film bearing the image is detached in thin films, in proportion to the action of the solution, without the underlying gelatine being in any way affected. The reduction seems to be due not to simple solution of silver, but also to removal of the film itself. The action is most apparent in the most transparent portions, a very perceptible relief being produced, and the fine details being eaten away.

Mercuric Salts.—Among the salts of this metal, mercuric nitrate is alone capable of being used for the reduction of silver images.

It is a salt melting at 6°C ., and is therefore liquid at the ordinary temperature of the air. A dilute solution of it is necessary in order to diminish its action on gelatine; 10 c. c. of the liquid salt in 200 c. c. of water is a suitable strength, and a solution made in this proportion rapidly reduces the silver image. The colour of the deposit does not show any particular change until the plate is washed, when a very appreciable yellowing takes place, a fact which rules the nitrate out of court as a practical reducer.

Other mercuric salts, when used in the same way, react with the silver of the image to produce insoluble mercury salts, which give the film the white and opaque appearance familiar in the case of bichloride of mercury.

In addition to the salts of the metals enumerated above, we have experimented with a number of others containing the metal in the higher stages of oxidation. Chromic salts, chromates, arseniates, vanadates, tungstates, and others all gave negative results. The best results came from cerium salts, and particularly from ceric sulphate.

Ceric Salts.—Those per-salts of cerium, the electro-negative radicle, which gives a soluble silver salt, such as the sulphate or nitrate, can be used as reducers, and act very rapidly without giving rise to any of the evils inseparable from the use of ferric salts. The sulphate obtainable in commerce is the best, the nitrate becoming rapidly reduced in aqueous solution. Neutral ceric sulphate, it must be noted, precipitates in presence of much water, but, if a little sulphuric acid be added to the solution, an acid salt results which has no distinctive action on gelatine even in strong solution. This salt can be used in concentrated solution, the exact strength merely determining its rapidity of action. Its ready solubility in water, the good keeping properties of the solution when acidulated with sulphuric acid, its rapidity and uniformity of action up to the exhaustion of the solution, make this reducer an extremely convenient reagent. It can be used for bromide prints without the danger of yellowing the whites.

The salt is best kept in a ten per cent. solution to which 4 c. c. of sulphuric acid per 100 c. c. is added. This acid solution does not act on gelatine, since it goes to form a feebly acid salt of cerium. This ten per cent. solution acts vigorously, and yet does not remove fine details in the shadows in preference to other parts of the negative as does the well-known ferricyanide and thiosulphate reducer. Its rapidity of action is easily controlled by simple dilution. A very rapid reducer, which acts more on the opaque portions of the negative than on the shadows, is produced by making a five per cent. solution of ceric sulphate.

General Conclusions.—We may thus conclude that, with the exception of ceric salts, none of the per-salts of the metals present any decided advantages as reducers of the silver image; that ceric sulphate possesses certain points which render it superior to Farmer's reducer, *viz.*, its preservation in a single solution, and others referred to above.

As regards the chemical reactions which take place when these various per-salts act on a silver image, they evidently consist of solution of the silver by a part of the acid of salt in proportion as this salt has been reduced according to an equation such as we have given above for ferric salts. In all probability this reaction takes place in every case when the heat of formation of the per-salt is less than the heat of the formation of the silver salt. It is thus possible to understand why certain per-salts reduce whilst others, united to the same electro-negative radicle, do not.

LUMIÈRE FRÈRES ET SEYEWETZ.

DEVELOPING TRAYS.

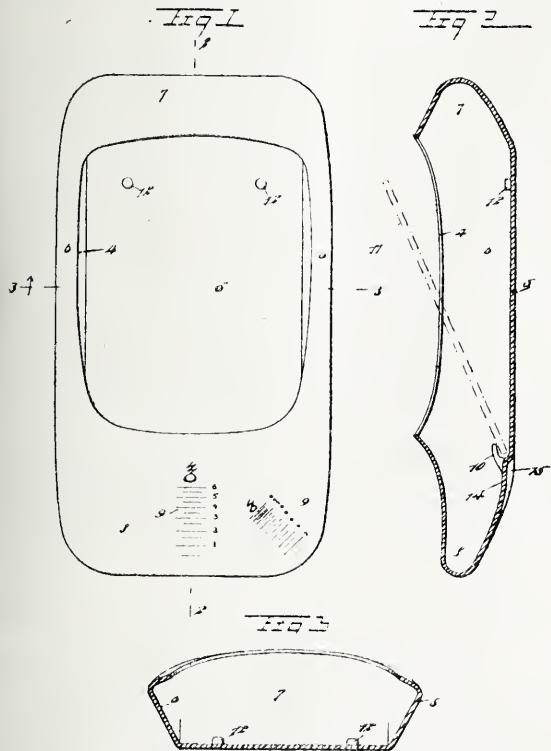
[Patent No. 7611 of 1899.]

THE invention of Messrs. Sheppard and Leech.

The tray is formed of glass, so that the whole structure is transparent, and is shaped with an opening, 4, in its top, which opening is of less area than the bottom, 5, of the tray, which arrangement is produced by ex-

ding the sides, 6, outwardly and upwardly, and thence inwardly, to form a partial top overhanging the bottom of the tray, to prevent the lashing out of the solution. The inwardly extending top of the tray forms at each end a cup, these cups being respectively designated 7 and 8, in one or the other of which the solution will be contained when the tray is placed on end; for example, when in the position shown in fig. 2. The top of the tray at the point of the cup, 8, is formed with 9 or any number of graduations, 9, thereon, by which graduations the quantity of the solution placed in the tray may be determined, it being understood that for this purpose the tray should be held in the vertical position shown in fig. 2, thus causing the solution to settle in the cup, 8.

The bottom of the tray is provided with two spurs, 10, adapted to hold the edge of the plate, and at the opposite end of the tray slight projections, 12, are formed on the bottom, so that the plate when rested in the tray will bear on these projections, and thus be held out of contact with the bottom of the tray. The opening, 4, in the top of the tray is so aped that the plate may be introduced into the tray to be engaged by the spurs, 10, and to bear on the projections, 12, and this opening is also tapered slightly toward the cup, 8, so that, when the tray is canted forward slightly from the position shown in fig. 2, and the plate, 11,



brown outward as the view shows, the side edges of the plate will engage the sides of the opening, 4, and the plate will be prevented from falling completely out of the tray. This construction enables the plate to be freely examined during the process of development. At the end of the tray, beneath the cup, 8, the bottom of the tray is formed with a raised portion, 14, which is broken by two downwardly extending ribs, 15, which ribs run longitudinally with the tray, and each describe a like curve which merges into the bottom surface of the tray. Each end of the tray is curved upward in the form of a rocker, thus permitting the tray, when placed on a table or other level surface, to be pitched or rocked longitudinally, for the purpose of effectually washing the plate with the solution. The ribs, 15, permit the tray to move easily in this pitching movement, while, at the same time, the raised portion, 14, serves, when the tray is in horizontal position, to throw all of the solution in the vicinity of the plate, causing the plate to be effectually washed, and avoiding the retaining of any of the solution at points of the tray where it will serve no useful purpose. The plate is introduced into the tray by moving the plate longitudinally towards the spurs, 10, and in a line inclined with reference to the bottom of the tray, so that one end edge of the plate is engaged with the spurs, whereupon the plate may be dropped through the opening, 4, upon the projections, 12. The removal of the plate is effected by a reversal of this operation.

PHOTO-MECHANICAL PRINTING SURFACES.

[Patent No. 16,944, of 1899.]

The invention of Herr E. Rolffs, of Siegfeld, who says: I have solved the problem of producing roller surfaces by photography. I take a negative or a diapositive made upon translucent film paper, and transmit the

same to the roller by pressure. The translucent film paper is provided with a net consisting of cross or longitudinal lines.

The roller to be treated is first covered with a substance sensible to the action of light, as, for instance, chrome gelatine. The negative is pressed upon the roller, the adhesion being increased by an oily substance introduced between the negative and the roller. The roller then is presented to the action of the light, brought into the dark room, the negative and the oily substance is removed, the roller is washed and then etched in usual manner.

The etched picture consists of engraved points or lines, which are determined by a net corresponding to the net previously applied to the translucent film paper. When a net of longitudinal lines is not employed, but one consisting of cross lines, care has to be taken that the lines of the picture do not run parallel to the blades of the ductor, but inclined to the same.

By means of this arrangement it is possible to prevent any engagement of the ductor into the lines of the drawing, whereby the picture during a short time completely would be destroyed.

From the aforesaid it will be seen that when the translucent film paper containing the negative or the diapositive is arranged in a certain manner upon the roller, the picture can be transmitted to the roller by photography, and rendered visible to the eye when etched.

PHOTOGRAPHIC EXHIBITION AT STRATFORD.

THE landscape of the east of London, as viewed from the windows of a carriage on the Great Eastern Railway, on a journey from Liverpool-street to Stratford, is not calculated to inspire the pen of the poet or to excite the enthusiasm of the photographer in search of the picturesque. The ugly factory buildings, the squalid dwellings, the overhanging smoke, and the canals, whose green slime forms almost the only verdant spots to be seen, all tell of lives of evil, and even for a fierce struggle for existence. Amid such surroundings one would hardly expect to find the aesthetic side of photography much in appreciation; nevertheless, we found on our visit to the Seventh Annual Exhibition of the Photographic Section of the Great Eastern Railway Mechanics Institute, on Wednesday, the 14th inst., a collection of photographs which would be creditable to a society with far higher pretensions to importance.

The Exhibition was held in the Lecture Hall of the Institute, and it was as well arranged as the circumstances would seem to permit. It was divided into the usual classes and there was also a class for engineering subjects. The landscapes, seascapes, and river scenery were, on the whole, good, that is to say, the average was a good one. There were few pictures which stood out from the rest, but, on the other hand, there was an absence of work which proclaimed the hand of the novice. As a rule, the mounting and framing were in good taste, and this applies to all the exhibits. In portraiture, &c., the work was distinctly over the general average in a society class. In architecture the section had done well, and, judging from the number of entries in the class compared to the whole number, this branch is a popular one. This is, no doubt, due to the predilections of the photographic instructor to the Institute, Mr. H. W. Bennett, F.R.P.S. We were surprised to find that an equal interest does not appear to be taken in engineering subjects. Situated as the Institute is, in the midst of the vast engineering works of one of our greatest railways, the importance of this branch of photography would seem to have no chance of failing to be recognised.

It is only human, however, to prefer to pursue one's hobby away from the spot upon which the daily bread is earned, and, in neglecting the opportunities which the members of this Institute have open to them they are, perhaps, only following a natural law. We have nothing to say against the quality of the photographs shown in this class, but we were disappointed at there being so few. Some of them were particularly interesting to us, particularly a series illustrating the various stages in the construction of the locomotive (No. 1900) intended for the forthcoming Paris Exhibition. The engine is not yet finished, and the series, therefore, is incomplete; but, when complete, it will form a record—perhaps a unique record—the value of which can hardly be over-estimated. We would remind the members that the making of pretty pictures by photography is not the most valuable use to make of it. The pictorial side of photography is a pleasant one to follow; but the greatest value of photography is in recording facts, and the members have the every-day opportunity of recording facts which though, perhaps, not very interesting from their familiarity to their own circle, are of interest outside it, and the records may become of the greatest importance when in the nature of things our present methods will become methods of the past. We would point out, too, that workshop life, though prosaic enough looked at generally, frequently presents opportunities for pictorial treatment. The Royal Photographic Society's medal was awarded a short time since for one of a series of pictures taken in a gas works.

The members' lantern slides were good, and the Open Class of fair average quality. The Judges were Messrs. F. Seyton Scott and H. Wilmer, F.R.P.S., in the General Classes, and Mr. J. Holden in the Engineering Class.

THE AWARDS.

Members' Classes.

- Class A (Landscape).—Silver medal, J. K. Ayling; bronze medal C. W. Harris.
 Class B (Architecture).—Silver medal, J. K. Ayling.
 Class C (Seascape and River Scenery).—Bronze medal, J. K. Ayling.
 Class D (Portraiture, &c.).—Silver medal, C. W. Harris.
 Class E (Instantaneous).—No award.
 Class F (Engineering Subjects).—Silver medal, A. Woolford.
 Class G (Lantern Slides).—Silver medal, C. S. Scott.

Open Class.

- Silver medal, C. W. Walker; bronze medal, W. E. Inston and M. D. Kerr.

Our Editorial Table.

THE SANDERSON HAND CAMERA.

Manufactured and sold by George Houghton & Son, 89, High Holborn, W.C. It would be hard to mention a desirable movement which the Sanderson Hand Camera does not possess. Available, as the illustrations show, either in the hand or on a stand, it permits of lenses of very great focal length being used, or, by a baseboard adjustment, the front of the instrument may be brought as near as two inches to the focal plane. For use as a hand camera (fig. 1): The front is rigidly fixed in an upright position, and it can then be drawn out and focussed, an engraved

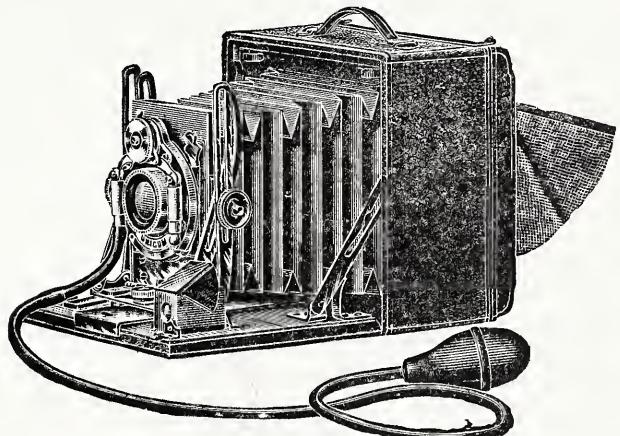


FIG. 1.

scale being provided for the purpose. For use as a stand camera (fig. 2): By raising the front, it is freed from the rigid supports provided for hand-camera work, and the universal movement is at once obtained by means of the slotted arms. The great rise of front which is then obtainable is of special advantage for architectural work in confined spaces, and does away entirely with the tilting of the camera and the necessity of swinging the back. The extension (fifteen inches in the quarter-plate size) is produced by means of the travelling frame in con-

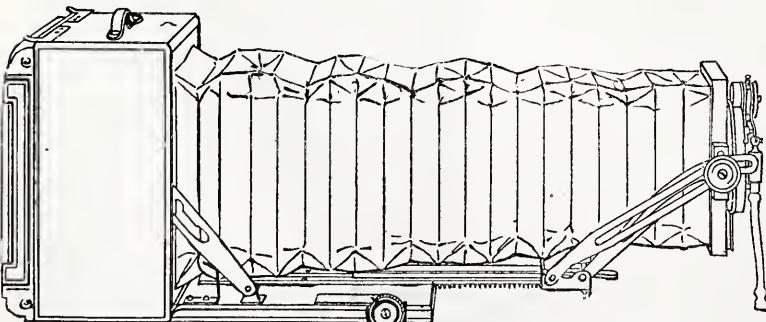


FIG. 2.

junction with the slotted arms (fig. 2), sufficient to use the single combination of a doublet lens or for copying to the same size. To describe the instrument fully: The camera is of polished mahogany, covered externally with fine grain leather. It is fitted with removable focussing screen with spring hood, reversing back, rack and pinion, and engraved focussing scale. The lens is of doublet form, with iris diaphragms, and working at f.8. The shutter is the "Bausch and Lomb Unicum," working between the lenses, and giving a varying exposure of from one second to 100th part of a second, either by hand or pneumatic

release. Time or ball exposures are also obtainable, the shutter in the latter case remaining open as long as the ball is pressed. The finder of the brilliant form, and shows the image the correct way up without distortion. The double dark slides supplied with the quarter-plate a 5 x 4 cameras are of solid pattern with vulcanite shutters. Eastman cartridge roll-holders can be easily adapted to the cameras, fitting in the same groove as the slides, and being in perfect register with the. We have carefully examined a quarter-plate pattern, and, in virtue of universality of movement, have no hesitation in pronouncing it perfectly adapted to meet every requirement for hand or stand work.

LUMIÈRE'S CERIUM REDUCER.

Sold by L. Gaumont & Co., 25, Cecil-court, Charing Cross-road, W.C.

On a previous page we give the translation of an article by Messrs Lumière, dealing with the per-salts of cerium for reducing purpose. Messrs. Gaumont have been good enough to send us some of the solution to test, and an accompanying circular points out the respects in which is claimed that the cerium solution is superior to older and better-known methods of attacking the deposit of a too-intense negative:—

It is usually in the presence of the two following conditions that negative requires to be reduced or weakened:—

1. The negative has been under-exposed and over-developed.
2. The negative has been over-exposed as well as over-developed.

In the first case the image must be reduced without any loss of already insufficient detail in the clear parts, and the use of persulphate of ammonia is particularly suitable. But the second case is different for there is need to increase contrast, and in consequence to act on the whole image, especially on the clearest parts. The combination of ferric cyanide of potassium and hyposulphite of soda, employed almost exclusively up to the present, attains this result, but presents the drawback of producing markings and irregularities, if the negative is not carefully washed each time it is examined during the operation. This mixture also changes very rapidly, and can only be prepared at the moment of use; moreover, its results are not good in the case of bromide papers. We have recognised that the use of the ceric salts does not present these drawbacks in any shape, and gives an action sure and regular, whether it be a negative or a bromide paper print to be reduced. The solution keeps without alteration, and can be employed right up to exhaustion.

The new reducer can be used as follows:—

For an over-exposed negative (in which contrast is to be heightened) take equal parts of this solution and of water. Plunge in the negative dry, and observe the action carefully, as it is very energetic. When the point wished has been reached, finish off with a complete washing.

For a negative slightly under-exposed and over-developed, plunge the plate, previously wetted, in—

Concentrated solution	1 part,
Distilled water	9 parts,

and when the desired effect is obtained wash as before. Any variation of these formulae may be made according to the depth of contrast desired.

In the case of bromide paper prints, the first solution in equal part must never be used, and the second (1 to 9 of water) should be considered as the strongest permissible, but may be weakened considerably.

The solution sent us was of the colour of amber, and we tested it reducing powers with a negative having the characteristics of slight over-exposure and over-development—perhaps the most common kind of defective negative produced, and one therefore of a sort likely to properly test the peculiar qualities of the cerium reducer. We found the solution act quickly; it converted the negative into a bright, harmonious image without staining it or selectively attacking it. If we may judge by our trials, the new reducer will be found distinctly useful to photographers.

THE "JOHANNESBURG" CHLORIDE OF GOLD.

Prepared and sold by C. E. Elliott, 36, Jewin-street, E.C.

The name applied to this brand of the principal reagent that is employed in the toning of silver prints, in view of contemporary military history in South Africa, is a singularly happy one. The crystals of the salt are of a brown colour, thus distinguishing the Johannesburg chloride from other varieties of the precious chemical. Practical trial of the Johannesburg chloride as a constituent of the toning bath satisfies us that it is an excellent preparation for the purpose. The tubes are guaranteed to contain the full weight of fifteen grains of chloride, and they are retailed at 1s. 8d. each, or 19s. the dozen.

MESSRS. H. & W. GREEN, of the "Crown" Photographic Manufactory Rotherham, send us a large number of samples of new mounts for the season. These are effective and tasteful in design, and they include the Rococo embossed, neutral-tinted Bristol mounts, fancy-border mounts, Oriental tissues, waterproof packing for P.O.P., and other specialities likely to be appreciated by photographers.

Studio Gossip.

MESSRS. ELLIOTT & SON, of Barnet, announce that, on and after March 31, a Barnet Studio plate will be issued under a new name and label, and will be known as the Barnet Medium plate. Samples of the Medium plate will be sent to professional photographers on application.

THE PHILADELPHIA PHOTOGRAPHIC SALON, 1900.—The Pennsylvania Academy of the Fine Arts announce that, under joint management with the photographic Society of Philadelphia, the Philadelphia Photographic Salon for 1900 (third year) will be held in the Galleries of the Academy from October 1 to November 18, 1900. This preliminary notice will be followed, in due course, by a full circular, with all details, entry forms, &c.

WE learn with interest that Mr. M. S. Berger (of Messrs. Berger & Co.) has three relatives at the front. A younger brother, belonging to the 1st Gordon Highlanders, was severely wounded in the charge of the Highland Brigade at Agersfontein when General Wauchop was killed; another brother is on the medical staff of Colonel Plumer's Rhodesian Regiment; and a nephew in the Royal Volunteers, only eighteen, but standing six feet four in his stockings, is in the armoured train catastrophe at Chieveley, and was rescued by Mr. Inston Churchill.

News and Notes.

AT the Röntgen Society's Ordinary General Meeting, on Thursday, April 5, 20, Hanover-square, a paper will be read by Dr. Norris Wolfenden and Dr. Forbes Ross on "The Influence of the X Rays upon the Growth and Development of Micro-organisms."

WE are pleased to learn that Mr. Henry Speyer's khaki lantern lecture on "Round about the Matterhorn" at Reigate, on Tuesday, March 13, realised a handsome sum of 40*l.*, which will be handed over to the War Fund. We heartily congratulate all concerned on the very great success of their efforts.

OUR bright and helpful contemporary, *The Junior Photographer* for April, will have a supplement in the form of a pictorial post card, given away with each copy. The Editor has sent us half a dozen of these pictorial post cards, which we are glad to have. The picture is entitled, *Bad News from the Front*. It represents an old man consoling his wife who may be supposed to be crying having bad news of her soldier boy.

THE PERMANGANATE REDUCER.—Mr. W. N. Jennings, of Philadelphia, has tried out some experiments with this reducer, and has arrived at a formula which is somewhat different from the published one: A, Permanganate of potassium, twenty per cent. solution; B, sulphuric acid, twenty per cent. solution, $\frac{1}{2}$ drachm; B, 1 drachm; water, 8 ounces. This reducing solution has one great merit, its cheapness; it is many times cheaper than any other. Very much over-exposed but thin, negatives, intensified with mercury and ammonia, and then reduced, although having a decided sepia tone, have the printing quality of perfectly exposed and developed negatives. If there is too much permanganate and too little sulphuric acid, a deep stain is produced.

TRAIL TAYLOR MEMORIAL.—At a meeting of the Committee, on the 14th inst., the Hon. Secretary presented a statement of account showing that 3*l.* 11*s.* had been invested in New Zealand three-and-a-half per cent. Stock in the name of the Trustees. He also reported an expenditure of 25*l.* 2*s.* 3*d.*, and cash balance in hand 10*l.* 11*s.* 10*d.* According to the provision of the trust deed it was decided by lot that the following members of the Committee retire: Messrs. T. Bedding, P. Everitt, H. Snowden Ward, and Sir Henry Trueman Good, as town members, and Messrs. W. I. Chadwick, M. J. Harding, H. P. Robinson, and A. Werner, as country members. The following gentlemen were then elected to the Committee: Messrs. T. E. Freshwater, S. H. Fry, F. V. Hyde, and J. A. Sinclair, as town members, and Messrs. T. Bromwich, F. J. Croall, A. F. Mowll, and C. R. Rowe, as country members.

A RADIOMETER for measuring the heat radiation of the stars has been tested at the Yerkes Observatory. The instrument is the outcome of the work of Mr. E. F. Nichols, of Dartmouth College. It consisted of a suspension system formed of two mica discs, each two mm. in diameter, blackened on the face, and supported by a light cross arm on either side of a thin glass staff, hung by an exceedingly fine quartz fibre in a partial vacuum. Both vanes were exposed to the radiation of the sky at the focus of a silvered glass mirror of twenty-four inches aperture, fed with light by a siderostat outside. The rays entered the radiometer through a small window made of fluorite. With the apparatus so ranged, a deflection of 0·1 mm. would be given by a candle fifteen miles distant, neglecting loss by reflection and atmospheric absorption. The results obtained showed that stellar heat radiation was distinctly detectable.

ORTOL.—At a recent meeting of the Photographic Society of Philadelphia, Mr. Caspar W. Miller, Chairman of the Technical Committee, made the following statement in reference to ortol: "As you know, ortol is, or at least was when it was first brought out, a light almost white or light grey, circular, finely crystalline powder, and it is so described in all the text-books that I have been able to find, and it used to be that until within about six months now, ortol is a perfectly white mass, composed of small round globules very much resembling sand or small hailstones. This is not the only difference, used to be very soluble, like pyro, in cold water; it is now very much less soluble, about as much so as sulphite of soda. It now smells of sulphurous acid, which it did not, and ought not to, smell of. They now crystallise ortol with sulphate of soda, and charge you for pure ortol. I thought I was paying too much for sulphite of soda, so I wrote to the New York agents and asked them why it was; whether the sample I had bought was adulterated, whether they were manufacturing a new compound. They said they knew nothing about it, but would write to Germany, where the stuff was made. Here the matter rests."

EFFECT OF LIGHT ON CHEMICALS.—A contemporary states that an interesting phenomenon has been observed by Wilhelm Marckwald in connexion with the change of colour undergone by certain bodies upon exposure to light, without being otherwise altered in composition or structure. The anhydrous chloride of quinquinoline, upon exposure to light, changes from a yellow colour to an intense green, returning to its original state when heated to 90° C., or if kept in the dark for a few days at the ordinary temperature. This change of colour is brought about in a few seconds by exposure to bright sunlight, and in a few minutes by diffused daylight; it is chiefly due to the more refrangible rays of the spectrum. No effect has been observed with the X rays. A similar action has been observed with the body known as β -tetrachloro- α -ketonaphthalene, which crystallises from its solutions, forming colourless and transparent crystals. These, when powdered and exposed to the light, change to amethyst colour; the large crystals, upon exposure, show a reddish-violet colour in one direction. These changes do not appear to be connected with a chemical or crystalline modification, and, by fusion, a non-sensitive modification may be obtained, which slowly returns to the sensitive form. To these phenomena the experimenter gives the name of phototropy.

ROCHDALE PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.—Under the auspices of the Rochdale and District Photographic Society there was a small but capital Exhibition of Photographic Pictures in the Temperance Hall, Smith-street, Rochdale, on Thursday, Friday, and Saturday of last week. It is the second of its kind, and is more ambitious than the first venture, there being three open classes this year, as well as classes for members only. Some of the best-known photographers sent exhibits, and several of the pictures on view had previously won gold and silver medals. Local photographers were well represented in the open competitions as well as in those for members. Over 200 pretty and interesting pictures were on view. The efforts of the Committee, who had made the arrangements, and of Mr. R. Turner (Hon. Secretary of the Exhibition), have proved very successful from an artistic point of view. There were six classes, and in each of them the standard of the work was very creditable. In the Members' Class for Landscape, Seascape, or River Scenery, the bronze medal was won by Mr. J. A. Jackson, of Littleborough, and a certificate was awarded to Mr. J. A. Grindrod, of Rochdale. Mr. Ernest E. Ashworth, of Smallbridge, carried off the medal in the Members' Class for Architectural Photography (interior or exterior), the subject being the interior of All Saints' Church, Hamer, Rochdale. Mr. George Smith took the certificate with a picture of the entrance to Whalley Abbey. The Members' Class for Hand-camera Work (set of six prints, any size or subject) did not evoke very keen competition, and the bronze medal was withheld. The certificate was gained by Mr. G. Smith with a very pretty set. The winners in the open classes were: Landscape, Seascape, or River Scenery, Messrs. R. Walker, silver medal; A. J. Loughton, silver medal; and Percy Hancock, bronze medal; Hand-camera Work (set of six prints), Messrs. William E. Inston, silver medal, and J. D. Murray, bronze medal.

A KHAKI LANTERN SHOW.—To the Croydon Camera Club belongs, we believe, the credit of being the first, and, so far, the only, Society to describe a lantern entertainment as a Khaki one. Anyhow, the Club is to be congratulated upon having secured a complete success on Wednesday, the 14th inst., when the large Public Hall in Croydon was crowded with an audience which was both distinguished and enthusiastic. Indeed, the would-be attendance was so great that a fortnight before the eventful evening the sale of all seats under 3*s.* was stopped. The programme, for which we understand the President (Mr. Hector Maclean) was responsible, seemed to exactly hit off the wants of the assemblage. Thus, the scene of war was illustrated by picked slides contributed by G. W. Wilson & Co. and Donald Currie & Co. Types of the Army and Navy were lent by W. Gregory & Co. The members, including Messrs. Beales and Bender, showed local C.I.V.'s. The actual operations at the front were graphically brought to sight by a telling series of tele-photo and other hand-camera pictures, taken by Mr. Henry C. Shelley, and specially prepared for the occasion by Mr. Francis T. Beeson. These were placed at the Club's service by the courtesy of "The King," who, we understand, will now be pleased to loan the above to other societies. They are well worth having. Kodak (Limited) also sent some war subjects, which were splendid examples of technical achievement, and in many cases exceedingly interesting in subject-matter. There were the usual martial songs, &c., about which we need say nothing. After the collection on behalf of the A.M.B., four tambourines, each of which had a photograph or sketch upon the under side, were put up to auction, and fetched 10*l.* The chief hit of the evening was, however, the bioscope, which was worked by Mr. Charles Urban himself. It ran for half an hour, and provoked an amount of enthusiasm which rivalled the plaudits that greeted Baden Powell and "Bobs" earlier in the evening. To particularise the films shown is not possible. Those who contemplate arranging for a bioscope at any similar lantern show can see what it is like by visiting the London Hippodrome, where it is used every night. Including 13 guineas collected and 10*l.* obtained by the sale of tambourines, the net profits will probably reach not far short of 100*l.*, the whole of which will go to Tommy Atkins and his children.

Commercial Intelligence.

THE City Sale and Exchange, of 54, Lime-street, and 81, Aldersgate-street, London, E.C., send us their eight-page list of cameras, lenses, shutters, and other photographic apparatus.

MESSRS. WELLINGTON & WARD, of Elstree, ask us to state that they will have much pleasure in supplying all dealers with a selection of choice show-cards if they will apply direct.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. W. B. Green, Gladstone-road, Watford, for his negative, "A Winter Scene."

IN the United States the metric system has made such progress that the Government of that country is contemplating its compulsory adoption by all contractors and others having business dealings with the State.

WE are informed that the firm of Perken, Son, & Co., of 99, Hatton-garden, London, has been registered as a Limited Liability Company under the title of "Perken, Son, & Co., Limited." As this course has been taken for purely family reasons, no shares have been, or will be, offered to the public.

"THE WITCHERY OF KODAKERY."—From one of our American contemporaries, *Outing*, we clip the following eloquent example of American advertising: "The subtle charm of art, the invigorating influence of active recreation, the joys of delving in the mysteries of chemistry and unveiling its photographic secrets, all or any one of these delights are in store for the Kodaker. In them is the witchery of Kodakery."

WE are informed that the photographic businesses hitherto carried on by the late David H. Hogg, in Montreal and Toronto, and more recently by Mrs. Hogg, in the name of David H. Hogg have been transferred to Mr. J. G. Ramsey, who will carry on said business under the name and style of the D. H. Hogg Company, but in which businesses Mrs. Hogg, and the estate of the late David H. Hogg have no further interest or responsibility.

THE WARWICK COMPETITIONS.—The following is the list of awards of the Warwick Competition for March:—10*l.* prize, Mr. W. Mitchell, Meadow Cottage, Selkirk, N.B., two prints of *Birds Feeding*; 5*l.* prize, Rev. A. H. Blake, St. Thomas Home, Basingstoke, *The Castaway*; 1*l.* prizes, Mr. C. M. Balguy, Weyhill, Andover, *Head of an Old Salt*; Mr. W. Bellerby, 8, Burton-terrace, York, *Church of St. Sebald, Nurnburg*; Mr. R. Clapperton, photographer, Selkirk, N.B., *On the Way to the Fields*; Mr. W. U. Clarke, Bridge House, Teddington, Middlesex, *Oak-carved Panel*; Miss G. Evans, The Spring, Kenilworth, *A Snow Scene*; Mr. F. W. Fielder, Foxenden, Dene-road, Guildford, *Draped Figure of Girl with Light*; Mr. A. E. Horne, the Glen, Queenstown, Ireland, *Sunshine and Snow*; Mr. F. Ingham, Winton House, Sale, *Pensive Thoughts*; Mr. J. Kearney, jun., 47, Dale-street, Liverpool, *February Fill Dyke*; Mr. E. Reed, 56, St. John's-road, Liverpool, *Winter, Rainclife Woods*; Mr. G. H. Schafer, 35, Laitwood-road, Balham, S.W., *Muddy February*; Mr. P. J. Slater, Sawtry, Peterborough, *The Slide*; Mr. W. T. Stokes, Ivydean, Grove-avenue, Moseley, Birmingham, *Bridge, Malvern Hall*; Mr. J. Thomas, 29, Llanover-street, Abercarn, near Newport, *Duckling are Fond of Water*; Mr. A. Thomson, Mounts Bay Hotel, Penzance, "*Fresh Fish! Fresh Fish!*" Mr. W. H. Tomkinson, 81, Dale-street, Liverpool, *Frosty Morning*; Miss A. Tomlinson, Fishbourne, Chichester, *A Study in Black and White*; Mr. C. S. Tyler, Earls Colne, Essex, *Morning News*; Mr. J. Welsh, 9, Mountain View, Whitehaven, *Stereoscopic View of Snowy Ghyll*; Mr. G. Young, 2, Six Houses, Ashington, *The Forge*.

THE First Annual General Meeting of Kodak (Limited) was held on Wednesday last at Winchester House, Old Broad-street, E.C., Sir James Pender, Bart., M.P. (the Chairman), presiding. The Chairman said: I have much pleasure in coming before you to move the approval and adoption of the Directors' report and the very satisfactory statement of accounts which have been presented. As this is the first annual meeting of the Company, some comparison may be expected between the promises of the prospectus and the performance, as shown by the accounts. In that prospectus we gave expression to our belief that the sales would continue to increase, and that the trade would expand, and you will all agree with me that the results have amply justified our expectations. It was shown that the profits for the previous year, after allowing for a preference dividend of six per cent., were equal to a dividend of sixteen per cent. on the ordinary shares, with a surplus of nearly 50,000*l.* We have for 1899 paid a dividend of ten per cent., and we propose to pay a bonus of five per cent., amounting in all to fifteen per cent., on the ordinary shares, while the surplus profits carried forward by the associated Companies amount to 151,846*l.* Instead of the revenue for 1899 being only five times the sum required to pay the preference dividend, it has been nearly ten times. It may be interesting to you to carry on the comparison of recent years' profits of the several businesses, which was instituted in the prospectus, and referred to at the statutory meeting. The combined profits for 1895 were 49,000*l.*; for 1896, 122,000*l.*; for 1897, 185,000*l.*; for 1898, 243,000*l.*; and, for 1899, 335,000*l.* Remarkable as these figures are, the Directors have every reason to believe that the businesses will continue to progress, and, so far, the returns for January and February of this year show satisfactory increases over those of the corresponding period of last year. The accounts of all the Companies have been audited by Messrs. Price, Waterhouse, & Co., and they have accordingly certified the joint account. I will now proceed to take such items of the combined balance-sheet as seem to require reference. The sum of £1,616,900 on the debtor side has included in it the value at par of shares held by shareholders in the Eastman Kodak Company other than Kodak, Limited. Sundry creditors stand at 40,602*l.*, whilst, on the other side, sundry debtors, after providing proper provision for doubtful debts, amount to 69,494*l.* The reserve account (Paris) refers to a reserve which, under French law, has to be made out of the profits of each year's business of every French company. The item "To interim dividend, December 31, 1899, amount outstanding 10,479*l.*" represents part of dividend due to be paid on and after January 1, 1900, and speaks for itself. The first item under the entry "To surplus account" shows the earnings of the Companies from November 21, the date of the purchase contract, to the end of the year 1898, after writing off balance of American goodwill purchase account; and the second item is the profit for the year 1899, amounting to 335,919*l.* making total profits for the period to December 31, 1899, of 345,778*l.* Lower down, among the dividends paid, the item of 2060*l.*, dividend to shareholders of Eastman Photographic Materials Company, Ltd., represents interest up to January 20, 1899 (the date of the completion of the purchase), and payable under the contract with that Company. On the other side of the balance-sheet, the goodwill and patents figure at 613,086*l.*; and I would draw your attention to the fact that, upon the basis of last year's profits, these assets are valued at a sum less than two years' earnings.

In connexion with the item of 304,834*l.* and 20,455*l.* "land, buildings, plant, machinery, furniture," &c., it should be understood that these amounts are arrived at after making liberal allowance for depreciation, a sum of nearly 14,000*l.* having been applied for this purpose in respect of the year 1899. Stocks on hand are valued at cost. The item of 69,494*l.* owing by sundry debtors, &c., has been arrived at after a liberal reserve has been made for doubtful debts. Railway investments speak for themselves; they are all high-class securities. I now turn to the item, "Investments in sundry photographic materials manufacturing companies, 421,280*l.*" It represents in the main the Eastman Kodak Company's investment in the General Aristo Company, which is a combination of all the principal gelatine and collodion sensitised paper business of the United States, including the paper business of the Eastman Kodak Company, the consideration for the latter being the sum of 1,727,000 dollars, say 356,000*l.*, one-half being in seven per cent. preferred shares, and the balance in common shares, the Eastman Kodak Company agreeing to manufacture its papers for the Aristo Company at cost. The purchase price for the Eastman Kodak Company's paper business was so arranged that its dividends on stock in the General Aristo Company are estimated to more than equal the amount it would have made by the manufacture of paper on its own account. As part of this transaction the Eastman Kodak Company were also allowed to purchase 150,000 dollars of preferred stock and 100,000 dollars of common stock for 150,000 dollars, making the total holding of Aristo Company shares equal to 1,977,000 dollars (408,000*l.*). The sole agency for the entire output of the Aristo Company is now in the hands of the Eastman Kodak Company upon terms which, while favourable to the Aristo Company, produce a handsome profit to the Eastman Kodak Company. Kodak (Limited) has the right at any time within three years to acquire all the shares in the General Aristo Company, paying for the same in shares of Kodak (Limited), the basis of exchange being equality of returns. This transaction having been initiated in America, your Directors, in a matter of such importance, deputed one of their number (Mr. A. S. Statham) to proceed to America to make an independent investigation and consult with the Board of the Eastman Kodak Company, and the business was not concluded until he had fully reported to us on the whole subject. The results have fully justified the action of two Companies. The surplus profits carried forward in Europe and America include investments in sound securities, by way of reserve of 71,808*l.*, and this reserve is now being increased to upwards of 100,000*l.* We have made application for a large slice of the new "Khaki" loan, and we only hope we may be fortunate enough to secure it. Our policy is to build up a good reserve, after providing a large cash working capital, for extensions of business and factories. Our assets are of a most substantial nature, and free from debentures and mortgages, or encumbrances of any description, and all preliminary expenses have been paid out of profits. The old members of the Eastman Photographic Materials Company, Ltd., will be glad to know that their vendor shares have been admitted to quotation on the Stock Exchange. As regards our trade, sales have greatly increased, and the business has been greatly extended. At the statutory meeting I announced the opening of a branch at Brussels, and since then we have established depots in Vienna and St. Petersburg. A separate company has been established under the Canadian laws, with head-quarters in Toronto, to exploit the business in Canada, and other plans are being matured for further extensions. The efficiently equipped factories at Rochester continue to supply us with improved film and most attractive lines of new goods. The future of Kodak business seems brighter than it has ever been. Although the name of Kodak, Ltd., is only a year old, it would be a mistake to conclude that the business associated with the Company is of a short period of growth, for the increase of the industry has been steady and regularly progressive for twenty years. Kodak, Ltd., not only concerns itself with Kodaks, but covers the whole field of photography, and caters for both amateurs and professionals. We are rapidly extending over the whole world, and this with our continued improvements, which make the practice of the art easier and cheaper, is likely to lead to a volume of business, the extent of which can hardly be estimated at the present time. I now move that the report and accounts be approved and adopted. Mr. George Eastman seconded the motion, which was unanimously adopted. A bonus of five per cent. was declared on the ordinary shares, making a total distribution for the year of fifteen per cent. Sir James Pender and Mr. A. Statham (the retiring Directors) were re-elected, and Messrs. Price, Waterhouse, & Co., were reappointed Auditors.

Patent News.

THE following applications for Patents were made between March 5 and March 10, 1900:—

- SHUTTER.**—No. 4184. "Improvement in Photographic Shutter." Complete specification. A. WOLLENSAK.
- REPRODUCTIONS OF TILES.**—No. 4276. "Improvements relating to the Process of Photographic Reproductions of Glazed Coloured Tiles and other analogous articles." F. C. SHARDLOW.
- PLATE-LIFTER.**—No. 4298. "An Improved Lifting Device or Attachment for Photographic Developing Dishes and other vessels." B. A. SPAULL.
- CHANGING BOXES.**—No. 4306. "Improvements in Change Boxes for Pictures, Photographs, Negatives, and the like." Complete specification. H. A. PÉRAUT.
- CINEMATOGRAPHY.**—No. 4434. "Improvements in Cinematographic Apparatus." C. RALEIGH.
- PRINTING FRAMES.**—"Improvements in Photographic Copying Frames for Negative Films." R. CARLS.
- STANDS.**—No. 4574. "Improvements in Stands for Photographic Cameras." Complete specification. E. M. M. SMITH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
6.....	Bradford Photo. Society	{ Members' Slide Night. Criticised by P. E. Newstead.
6.....	Kingston-on-Thames	Intensification. W. E. Price.
7.....	Birmingham Photo. Society	Odds and Ends. C. S. Baynton.
7.....	Hackney	How a Lens is Made. C. P. Goerz.
7.....	Isle of Thanet	{ A Practical Lesson in Outdoor Photography. A. Horsley Hinton.
7.....	Leeds Photo. Society	{ Some Possibilities of Photography. E. J. Wall.
7.....	Royal Photographic Society	{ Some Developers Compared. Alfred Watkins.
8.....	Borough Polytechnic	Lantern Night.
8.....	Croydon Camera Club	Tenth Annual Dinner.
8.....	Southsea	{ Committee Meeting to Arrange Summer Programme and Excursions.
9.....	Ashton-under-Lyne	Exhibition of Cameras.
9.....	Leigh	{ Plates and Papers for Pictorial Work. A. Horsley Hinton.
9.....	Liverpool Amateur	The Norfolk Broads. J. Sirett Brown.
9.....	London and Provincial	Paper by Mr. Haddon.
9.....	Oldham	{ A Practical Lesson in Outdoor Photography. Reader, J. Chadwick.
0.....	Croydon Microscopical	Prize Slides.
0.....	Southport	{ Exhibition of Competition Slides. Members only.
0.....	West London	{ Beginners' Meeting: Finishing Prints. J. Brown.
0.....	Whitby	Composition. F. Wasley.
1.....	Liverpool Amateur	{ Excursion: Little Ness and Burton. Leader, C. F. Depree.
1.....	Southport	Public Exhibition of Competition Slides.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 20.—Photo-mechanical Meeting.—Mr. H. Snowden Ward in the chair.
PHOTOGRAVURE.

Mr. IGNATZ HERBST exhibited a large number of very fine photogravure prints, both in monochrome and in colours, most of them being about 36 x 24 inches in size, and all of them produced by his own firm in London. He also showed the negatives and transparencies used for the production of the plates, and gave a short talk with reference to the difficulties which had been overcome in order to make the business a commercial success in this country. At first he had had to employ collodion emulsion for the negatives, as no English firm was able to make evenly coated dry plates of such large size, but one London establishment had lately succeeded in producing satisfactory orthochromatic dry plates of the requisite dimensions, and he was now using them. For the transparencies he preferred carbon tissue, which was cheap and easily handled, and with which retouching was facilitated. In order to ensure uniformity in the etching solutions, the perchloride was purchased by tons at a time, and the solution was found to work better if made up some considerable period before it was used. Photogravure was quite useless, as a commercial process, without skilful and artistic work on the plate, and it was in this particular that the method was essentially not a mechanical one. The coloured prints were produced at one operation, the plate being inked up with all the colours by a sponging process, as many as half a dozen men being engaged on a plate, each taking a different colour. The time occupied in inking the plate for one of the large prints exhibited was said to have been about two hours for each print. Mr. Herbst has a most intimate knowledge of this branch of photo-mechanical work, and he and his colleague, Mr. Reichs, very kindly offered to answer, without reservation, any questions upon the subject which might be put to them, an offer of which several members availed themselves in the course of the informal conversation which followed Mr. Herbst's introductory remarks.

The Rev. F. C. LAMBERT said that some years ago he experimented with the process, and endeavoured to apply inks locally, but he invariably found that in wiping the plate the inks were shifted and smeared.

Mr. REICHS said the inks were of the same character as those used in copperplate printing, and were applied with a daber or stump, or other suitable appliance, and wiped off first with muslin and then with the hand. No stencils were used to assist in inking, and successful work could only be done by men possessing some artistic taste and training, and then only after long practice.

Mr. W. GAMBLE, without in any way detracting from the satisfactory nature of Mr. Herbst's results, remarked that the process had been in use ever since the days of Bartolozzi and Morland, who got very fine results by means of multiple inking. Great credit was due to Mr. Herbst for having made the method a commercial success, and his prints were certainly far superior to those of the old etchers.

Mr. HERBST admitted that the process was not new, but claimed to have brought it to a higher degree of perfection than had previously been known in this country; he was unable, however, to find suitable workmen in England, and had to get them from the Continent. A great deal depended upon the etching of the plate. For colour work the etching must be much deeper than for monochrome; but, if the plates were properly etched, each part of the picture would take up the right quantity of ink, and any number of prints of uniform character could be produced. The publishers were prepared to pay a fair price for good work, and he was satisfied if a plate produced six prints a day, although double that number could be obtained if necessary. The life of a plate varied from 2000 to 5000 impressions, according to the nature of the subject and the ability of the printers; in the hands of some printers a plate would be spoilt after twenty-five prints had been made.

Major-General WATERHOUSE had seen photogravure printing in colours at Paris, but one man did all the inking, and only about two prints could be made in a day.

Mr. J. C. WARBURG did not deny that photogravure was an artistic process, but he did not think that its artistic character was enhanced by retouching; in fact, he was of the contrary opinion. He asked whether differences of tone and colour were produced by the use of more ink, or inks of different colour, or more than one inking.

Mr. HERBST said the plate was etched deeper in the deeper shadows, and consequently held more ink; in certain parts of a picture different inks would be blended to produce a particular tone of colour. With regard to retouching, photogravure would be quite useless without it, and an untouched picture would not be marketable.

Mr. WALLACE CROWDY said a certain amount of mezzotint work was essential, especially in the colour process. Differences of tone or colour were produced not only by differences of ink, but the plate was, in the first instance, made suitable for the end in view by a certain amount of hand engraving or retouching, which was a most delicate process. In his opinion, photogravure was essentially an artistic method, and the best plate in the world would not produce a satisfactory result in the hands of an unskilful printer.

The Rev. F. C. LAMBERT asked what method of etching was adopted by Mr. Herbst.

Mr. REICHS replied that the perchloride solution was used in three strengths, 40°, 37°, and 36° Beaumé, and sometimes 33°. He did not favour the one-solution method, either with or without dilution.

Mr. LAMBERT next started the evergreen subject of devils, their cause and cure, with the usual inconclusive result. They were attributed to bad copper, impure bitumen, peculiar atmospheric conditions, and other causes, but no infallible remedy was suggested.

COMING EVENTS.

March 27, Mr. Alfred Watkins, "Some Developers Compared." April 3, the last Lantern Evening of the session, "Slides Old and New," by Mr. F. P. Cembrano. April 10, "The Municipal Encouragement of Photography," by Mr. Thomas Bedding.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 15.—Mr. Wilfred Emery in the chair.

Mr. R. BECKETT showed an example of copying from an old and yellow albumen print. The resulting negative was printed on Gravura paper, the quality of the production being very good, original and copy were passed round.

Mr. S. H. FRY, referring to copper toning, said that he doubted whether the best results were obtained if the bromide print to be toned were fixed in the ordinary way. Better results would be secured if there were a trace of ferricyanide in the fixing bath, for this reason. In the bulk of the prints he had seen which had been toned with copper there was a tendency to a pink deposit all over which, in the whites, was particularly noticeable. This was probably due to silver imperfectly removed by the hypo, or an excess of silver in the hypo. He therefore recommended a final fixing in clean hypo solution to which had been added some ferricyanide.

Mr. ERNEST HUMAN read a paper upon

ORTOL,

which he endeavoured to prove to be the ideal developer. Extreme latitude of exposure, ability to give hard or soft results, absence of tendency to cause chemical fog, continued use without deterioration and discolouration, absence of staining proclivities, inexpensiveness, and independence of caustic alkali, have been stated as the attributes of the ideal developer, and all these the lecturer claimed for ortol. It worked well with any brand of plates, films, and bromide papers. In action it greatly resembled pyrogallop without the stain of the latter, the image appearing perhaps a little quicker, whilst the effects of modifying the composition agree very closely with those of pyro. He then gave the maker's formulae, and, in commenting thereon, said a word of warning about the undue increase of sodium sulphite, which, with ortol acted as a retarding agent. Mr. Human made up his solutions in three parts, as follows:—

(1) Water	80 ounces.
Pot. metabisulphite	$\frac{3}{4}$ ounce.
Ortol.....	1½ ounces.
(2) Water	80 ounces.
Soda sulphite	14 ,,
(3) Water	80 ,,
Soda carbonate (crystals)	10 ,,

With the developer in this form, the sulphite can at will be left out, although, as a rule, equal parts of the three solutions are taken, with bromide as required. Without sulphite the mixed solution has not the same keeping powers; but the lecturer had used it even after three days. Hypo in certain proportions acts as an accelerator, and a few drops of a five per cent. solution may be used to this end. Mr. Human passed round some plates developed with the old solution, which quite satisfied him, although it is true the time of development was prolonged. He also passed round two negatives, one of which, by accident, received an exposure of 40 seconds, instead of $\frac{1}{15}$ second, which was given to the other. The properly exposed plate was developed normally. The other was put in a solution some three months old, which had been repeatedly used, and with every satisfaction. Bromide prints, illustrating the claim for latitude in exposure, were also passed round. The following remarks were concerning the continuing action of ortol under a stream of water. A half-developed plate, placed under the tap for a few minutes, will be found ready for fixing. This power, Mr. Human thought would be of much use in times of pressure of work. Ortol could also be used for simultaneous development and fixing.

Slight over-exposure is essential, and a plate which develops quickly. In conclusion, Mr. Human said that ortol had superseded all other developers for practical purposes in this work.

Mr. R. BECKETT confessed a great liking for ortol, which he had used very largely.

Mr. W. D. WELFORD said it was not so sensitive to fluctuations of temperature as was hydroquinone, and was very much like pyro. A point which had not been alluded to was the speed with which work could be turned out. He had noticed it especially when dealing with large quantities, and found that 45 or 50 seconds was ample for a magnificent negative. No other developer was, he believed, so quick.

Mr. A. MACKIE criticised the practice of making up three solutions as recommended by the lecturer, for the reason that directly he used sulphite he weakened his developer.

Mr. WELFORD said that the solution was nearly saturated at the strength given. Water alone had not the retarding or slowing action of the sulphite solution.

PHOTOGRAPHIC CLUB.

MARCH 14.—Mr. E. W. Foxlee in the chair.

The CHAIRMAN showed a couple of negatives developed respectively with some old used kachin solution and some freshly mixed solution for comparison. The new solution gave a finished negative in five minutes, while the old used solution took eighteen minutes. The latter solution gave an image slightly thinner than did the new solution, but with just as much detail, and he thought four or five minutes longer would have shown that the developing properties of such old solutions had not deteriorated except in the direction of speed. The old solution was a long time making a start, but, when the image once showed itself, things went quicker than one would imagine.

Mr. A. MACKIE, after examining the specimens, remarked that the only effect of age seemed to be to increase the time of development. There was no difference in the scale between one and the other. It must be remembered that the developer was not only old, but had been used several times. In such a case the accumulation of bromide must be taken into account.

A discussion ensued on this point regarding the action of bromide.

It was pointed out by Mr. MACKIE that bromide with a pyro-ammonia developer, for instance, gave increased contrast. With kachin it seemed to exert only a slowing action, as there was no more contrast in the one negative than the other.

Mr. J. W. MASON mentioned some recent experiences with ferrous oxalate as a developer. Finding that a normal developer was a long time in bringing up density, he modified the developer with the addition of more iron, but eventually found a muddy deposit result from the continued addition of iron. He wished to know what was the limit to the quantity of iron allowable in the solution.

It was pointed out that neither the oxalate of potash, nor the sulphate of iron, was the reducing agent, but the combination of the two—ferrous oxalate, and that the excess of iron added was thrown down as ferrous oxalate. It was useless to add the iron to such an extent.

Goldsmiths' Institute Camera Club.—March 15.—Mr. DONALD A. NIGHTINGALE gave a demonstration of the value, for special purposes, of some recent introductions in Velox paper. After a description of the various precautions necessary for successful work with all the Velox papers, the method of printing on the sensitised post card was practically shown. Prints were also made on double-weight Velox, and the new process for obtaining colours by direct development with kachin received considerable attention. Some remarkably good colour effects were obtained, and other specimens by the same process were submitted for inspection. In reply to questions as to whether uniformity of results was possible in cases of modified development, Mr. NIGHTINGALE stated that, where the production of a number of uniform prints was desirable, the most satisfactory method consisted in developing the whole of the exposures at once in a large dish containing, say, one pint of developer. There is no risk of uneven development, since, as in toning P.O.P., the process occupies from five to ten minutes.

North Middlesex Photographic Society.—February 12, Mr. F. M. Ainsley in the chair.—A discussion took place on the following question "Which is the best method of producing large prints, enlargements from small negatives or large negatives?" Mr. MUMMERY opened by upholding the case for large negatives. He said that there was generally better quality to be found in large direct work than in enlargements, and it was really economical, as more care was generally taken in all the operations, so there was much less waste. Mr. H. W. BENNETT, on the other hand, said that better results could be got by making enlarged negatives. All large lenses, even of the best makers, fell far short of smaller ones of the same class in quality. Consequently, better technical results could be got in small negatives, and many things easily taken with a small camera with a lens working at f-8 or f-11, became impossible, if attempted in large sizes, owing to the necessity of stopping down considerably with large lenses.

FORTHCOMING EXHIBITIONS.

1900.

- | | |
|-----------------|--|
| March 26 | Twentieth Century International, Birmingham.
Walter D. Welford, 19, Southampton-buildings,
Chancery-lane, London, W.C. |
| ,, 26-31 | Photographic Society of Ireland. W. F. Cooper,
35, Dawson-street, Dublin. |
| April 3-7 | Birkenhead International. C. F. Inston, 25, South
John-street, Liverpool. |

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE COPYRIGHT BILL.

To the EDITORS.

GENTLEMEN,—I have read Mr. Bale's address on the proposed Copyright Amendment Act, and the eulogiums on it by other members of the Society of Arts, with amazement. It looks nothing short of an impudent attempt to legalise things so that publishers may reap where they have not sown, with the blessing of British law on their hoary crown; that they may safely use for their own profit the work of the despised photographer without even a "collie will ye lick." And these people prate of piracies, themselves sighing for letters of marque! How is it that Messrs. Bale, Scruton, and East pose as our guardian cherubs? I am not aware that photographers are dissatisfied with the present state of the law, or admit the right of publishers or painters to constitute themselves our benefactors, and, no doubt, most of us would be grateful if these gentlemen would confine their attention to their own affairs. We cannot believe that this surprising solicitude for our welfare is purely philanthropic. Mr. East says eminent photographers have been consulted. Who are they? But I object to distinctions being drawn in law between one member and another of a profession. Under this Bill all using paint, however abortive and painful the result, are classed as painters. Failure to be eminent is condoned. If Mr. East can be so generous with his less gifted brethren, neither will eminent photographers, whoever they are, betray their own kind, even though tempted with the prospect of hobnobbing with eminent artists.

I beg leave to doubt if the gentlemen aforesaid at all represent the general opinion of painters regarding the compulsory registration of photographs. I cannot see what benefit painters would derive from it, and neither can they. We object to no part of the Bill really framed in their favour. Why should painters interfere with us? Without doubt, the proposal emanates from, and is in the interests of, publishers, and in their interests only. Photographers have become indispensable to them, and have a new and unexpected value, a sort of unearned increment, which they feel would be better in their pockets than in ours. Meanwhile the whip of the law keeps the "wretch in order." It is no fault of ours that magazine publishers have discovered a new source of profit in our humble productions. We regret it. It is a deplorable fluke and an altogether inadequate recompense for the ruin of our legitimate business by process work. Our intention has been, in making negatives, to publish copies of them by our own methods, which are incomparably more beautiful than any mechanical process.

The reasons given for altering the law do not bear inspection. (1) Photographs of paintings are made in Jersey and hawked about the mainland at a low figure, to the hurt of publishers who have paid for the copyright, and the law provides no practicable means of stopping it. I hope the part of the Bill amending this will pass, and that the knavish firms who copy paintings, without authority, by means of photography, and sell photographic prints, shall be laid by the heels forthwith. This should be extended to prints in ink by process blocks from photographs. A photograph compared with a painting is of little value. Still, it's our pet ewe, and all we have. What's not worth asking is not worth taking. Every publisher of a newspaper or magazine, sold in shops, or hawked or peddled about the country, should be easily punished if he cannot show that the originals of his photo-illustrations were taken by himself, his "special artist," an amateur friend, or have been purchased for the purpose from some obscure practical photographer. (2) Painters are poor and neglected till just before they die, when they become famous, therefore their widows should be consoled with thirty years of copyright. Photographers, on the other hand, create a great sensation, from an early age, and are so run upon that they amass wealth to such a degree that their widows do not require any *post-mortem* consideration. (3) A would-be publisher of a photograph cannot at present tell whether it is copyright or not. Every publisher knows that the copyright of a photograph is vested in the photographer. Let the publisher apply to the maker of the photograph as he does to the maker of a painting. It is only necessary to register when the copyright is infringed, the idea being to save the question of ownership being disputed in court, and to confine the action solely to proof of infringement.

The call for compulsory registration is a very slim proceeding. Publishers know that, if in palmier days we might have registered, we cannot

fford it now. For instance, take a view photographer with 1500 negatives. 1s. 6d. each, postages, and 3000 prints, would cost 190*l.*—about two years' wages of such a business. But I have hopes that, if the matter is well managed for us, the Lords will not agree to compulsory registration. If they do, there are means of avoiding it, and yet making the use of our work for process blocks impossible. Of this I may write again, though not in your next.—I am, yours, &c.,

BLACKING Box.

March 13, 1900.

PLATE BACKING AND SENSITIVENESS.

To the Editors.

GENTLEMEN,—Will you permit me to make a few remarks upon an article in a recent number of THE BRITISH JOURNAL OF PHOTOGRAPHY upon "Plate Backing and Sensitiveness." The writer of the article herein stated that, in his experiments, the resultant negatives of backed and unbacked plates were absolutely identical.

A short time ago I showed before a London and Provincial meeting negatives and prints therefrom, the plates having been *partly* backed. There was no doubt about the slowing of the backed portion—not great, but still there. The writer of the article must be a bold man, and a rash one to boot, to believe he got identical exposures under the conditions therein set forth. The slowing is not of a very pronounced character, and in the comparing of one negative with another might easily escape detection. Let the writer do as I did, back *part* of a plate, expose it upon an evenly lighted subject—there is no need for a sensitometer—he will then see the difference.

There is another point that seems to have escaped his notice. One must not forget that the backing does not really slow the plate, but simply absorbs the light which has passed through the glass, which otherwise would be reflected back to the film, thus giving increased action where unbacked, so that, if you use yellow light—or, at least, light poor in the violet rays—to start with, you ought not to expect much further action upon the film after it has passed twice through the green glass. I myself used in my experiments magnesium or daylight.

Backing with a white pigment just as distinctly, perhaps in a slightly higher degree, shows acceleration. I have been lately trying coating paper with a composition somewhat like that used for the "—graphs" with the addition of zinc oxide. There is no doubt that it increased the exposure—that is, with a given exposure there is an increased deposit of silver, upon development, where the plate has been backed with the white backing. Of course, such a plate would be used only upon occasion. There are times when even this small increment of density may be of value. I have not yet hit upon the best proportions to use. The conditions required are that it shall be easily pressed into contact and as easily removed, leaving none attached to the glass. Variations of temperature and the hygroscopic properties of the composition make this rather awkward to lay down hard-and-fast lines.—I am, yours, &c.,

17 Albert-road, Walthamstow, March 13, 1900. ALF. J. BROWN.

[We shall be referring to this subject next week.—Eds.]

PHOTOGRAPHY AT THE PARIS EXHIBITION.

To the Editors.

GENTLEMEN,—I was astonished at the knowledge of the different parties knowing all about the charges to be made during Exhibition time here, as printed in THE BRITISH JOURNAL OF PHOTOGRAPHY, while here nothing definite could be learned. Now I can give you in full the rules, as published a few days ago.

1. The use, during the Exhibition, of hand cameras is free, but under conditions as expressed in Notes 3 and 4.

2. The use of camera with tripod is only allowed until one p.m., and is subject to a permit delivered by the Commissaire Général, and subject to a fee.

The permit is given for one day, or from the time of opening of the Exhibition. In the first instance the operator receives a special ticket, which costs twenty-five francs (1*l.*) per camera. The ticket is obliterated at the entrance.

In the second instance the season ticket is a card with the photograph of the operator. This ticket costs 1000 francs per camera (40*l.*).

The payment of above dues does not dispense the operator or his helpers from the regular admission fee of the grounds.

3. Nothing can be photographed without written permission from exhibitors. Permission must also be obtained from foreign representatives, &c., to reproduce their respective palaces and pavilions. The Administration of the Exhibition declines all responsibility for reproductions taken.

4. The operators must in no way interfere with the free circulation, and must submit to orders of the agents of the Administration.

The faculty to photograph remains submitted to all rules which may hereafter be issued in the interest of good order and police.

This is all at present, and if I have not translated the paper word for word, the sense of it is fully given and exact.—I am, yours, &c.,

Asnières (Seine), March 18, 1900.

A. Lévy.

REFLECTOR HAND CAMERAS.

To the Editors.

GENTLEMEN,—Referring to Messrs. Watson & Sons' letter which appears in last week's issue of your JOURNAL, in which it is stated that the Gambier Bolton camera is practically an exact specification of the camera I described in my letter of March 2, will you permit me to point out that this statement is incorrect. If Messrs. Watson & Sons will refer to my letter of March 2, they will find that I specified a shutter capable of giving exposures as long as one-tenth of a second, and that the camera itself should be of the box pattern, and by box pattern I meant a camera in which the bellows, front panel, and lens is absolutely enclosed, the front of the box simply having a circular aperture cut out to admit of the free passage of light to the lens. The shutter fitted to Messrs. Watson & Sons' camera will not, I believe, permit of lower exposures than one-twenty-fifth of a second, and, as far as I can recollect from an inspection I made of the Gambier Bolton camera some time ago, the front has to be opened and the back dropped before an exposure can be made.

In conclusion, I may say that since the date of my last letter I have been in communication with a London firm who are shortly bringing out such a camera as I described, though they intend fitting a behind-the-lens roller-blind shutter, giving various speeds, from one-tenth up to one-three-hundredth part of a second. I am informed that this camera is to be small and compact.—I am, yours, &c.,

R. N. R.

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—In the welcome number of the BRITISH JOURNAL OF PHOTOGRAPHY of to-day, "Free Lance" says: "I don't think that what I wrote about the metric system was really read by," &c. The fact is that my letter (see February 2) was written long before "Free Lance" ever thought about writing what he knew or better did not know about the metric system and its use in France. If by what I said in my letter, which he at least read, I suppose, proves to the hilt of his contention that he is right, he is easily satisfied, I dare say. If, however, he would give us some facts and not empty words, he could prove something to others' contention. On January 19, he says: "All this agitation in favour of the metric system," &c., and then goes on speaking about kilos and pounds. On March 16, line 14, he says: "for a pound is no part of the metric system." What does all that mean except that "Free Lance" does not know very well the subject he has undertaken to talk of? He seems to ignore the origin of the kilo, or else he would not say that a pound is no part of the metric system.

The metric system is not exactly the metre, but a certain measure, call it what you like, which is divided into 10, 100, 1000, or more parts which are easily divided, multiplied, &c. It is always funny to hear a foreigner, be he English or French, discuss things from the other country of which he knows nothing about, and these words of "Free Lance" seemed so out of the way that I did not consider them worth an answer, but since he insists let him explain them. Here they are: *In the very home of the metric system, the metric system as a system is practically non-existent, at any rate, for domestic purposes.* What does that mean? Please let us know what is the system used here. By here I do not mean Asnières but France, the same as "Free Lance" probably means England when he writes; however, his notes bear no date, no place, and are anonymous, but, if he had a place or city, he would not mean that special city (sarcastically or not).

Referring now to his problem I find that 160 grammes to 2000 means at a glance 1 gramme in 125, now if 70 grains in 20 ounces mean 3½ grains in 1 ounce, how about 1 grain. It is, of course, 1 grain dividing the ounce into 7 parts multiplied by 2. Then is it troy or avoirdupois. This example does not seem a happy one to have been chosen by "Free Lance." I hope that when "Free Lance" has studied the origin of the kilo and its subdivisions he will no more say they are no part of the metric system.

A. Lévy.

Asnières (Seine), March 16, 1900.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

A. J. Ashbolt, 10, Exmoor-road, Southampton.—Photograph of group of Southampton Football Club, full cup team.

J. W. Dale, Wellington House, Victoria-road, West Hartlepool.—Photograph of the Mayor of West Hartlepool. Photograph of the Mayoress of West Hartlepool.

T. E. Innes, 108, Wellington-road, Heaton Chapel, near Stockport.—Photograph of Heaton Chapel Reform Club. Photograph of Heaton Chapel. Photograph of Heaton Moor Conservative Club. Three photographs of Heaton Moor-road, Heaton Moor.

DARK VIGNETTES.—S. A. and C. BIGGS. See leading article in our last issue.

E. H. ORANGE.—In all probability, if you lay the facts before the local Superintendent of Police where the person complained of resides, you will succeed in obtaining a return of the money and negatives. We regret to have your complaint.

ADDRESS WANTED.—C. R. C. asks: "Can you give me the address of E. Cheron (I believe somewhere in Paris) who makes the E.C. ferrotypes dry plates in cut sizes?"—In reply: We do not know the full address, but a letter addressed simply "Paris" would, no doubt, be duly delivered.

ESK.—We should not expect the developer to keep indefinitely in the one solution. If you use it made up as separate solutions, we should expect it to be powerful enough for your purposes, the proportion of alkali to reducing agent being very great. Try the latter suggestion, which, we think, will get you over your difficulty.

SILVER WIRE.—WET PLATE writes: "Where can I get pure silver wire, such as is used for the corners of the carriers of dark slides for the wet-collodion process? A jeweller got me some, but it stains the corners of the plates."—Pure silver wire may be obtained from most refiners. It may, we know, be obtained at Johnson & Matthay's, Hatton Garden.

SECOND-HAND LENS.—J. R. J. The large lens mentioned would be suitable for your requirements, and seems remarkably cheap at the price asked for it. There is, of course, a certain amount of risk in purchasing second-hand apparatus. We should advise you to have the lens sent to the maker whose name it bears for verification before paying the amount.

DARK ROOM.—W. CONWAY. The room you describe as your dark room is certainly very inconvenient for working in, but many amateurs would like to have it. Some of the rooms they have, perchance, to be content with are far less convenient than yours. Though somewhat inconvenient, there is no reason why the best of negatives should not be developed in it.

TEST FOR HYPO.—HYPO writes: "I have to wash some negatives of prints by repeated changes of water. I am anxious to know if all hypo is out of both. Is there not some chemical which, when put in the last washing, will show whether hypo is present or not?"—Tests for the presence of hyposulphites will be found on pp. 975 and 976 of the ALMANAC for 1899, both of which are very delicate.

PRESS FOR COLLOTYPE WORK.—TYRO. A typographic press will do quite well for colotype printing, but we should recommend you to have a proper colotype press, as you have to purchase a press. Being specially made for the purpose, they are more convenient in use than the ordinary Albion presses. Collopye presses are supplied by Penrose & Co., Winstone & Sons, and others.

COPYRIGHT.—G. A. B. says: "I have received one of the Queen's boxes of chocolate from a friend at the front, and have been asked by several friends for photographs of same; and, as the box is copyright, I would like to know if I would be infringing the copyright by supplying them with photographs?"—In reply: The design is probably registered. By reproducing it, you would render yourself liable to be proceeded against.

STEREOSCOPIC PHOTOGRAPHY.—M. M. LAKIVI says: "I shall be much obliged by your informing me where I can get stereoscopic transparencies on glass and paper, and coloured stereoscopic photographic slides?"—In reply: Messrs. Lévy, Rue Louis le Grand, Paris, supply transparencies. Paper slides are obtainable from Messrs. Underwood & Underwood, Red Lion-square, London; Messrs. Catherall & Prichard, 326, Camden-road, London; and Messrs. Seaman & Sons, Chesterfield. We do not know the source of the coloured slides.

ADDRESS WANTED.—SUBSCRIBER says: "On reading your notice respecting acetylene, you give the name of Mr. G. F. Thompson (Consulting Engineer), Lombard Chambers, Brixton-street, London, E.C., as the publisher of a book on this gas. I wrote there, but my letter has been returned, not known. You would do me a great favour by giving me his address in your next, as I wish to obtain his book."—In reply: It is not surprising that our correspondent's letter was returned to him. Mr. Thompson's address is Liverpool, not London.

BLINDS FOR STUDIO.—HANTS says: "My studio is lighted both on the south and north sides. I sometimes, though rarely, want to work with the south light, therefore do not wish to block it out permanently. At present I have black blinds and curtains on that side, but they look very funeral-like, and, moreover, are worn out. Can you suggest anything of a more pleasant colour that would answer the same purpose?"—A dark green will be very agreeable to the eye, and answer the purpose quite as well as black, provided the curtains and blinds are of a tolerably thick material, so as to stop out the light.

SURFACE ON BROMIDE ENLARGEMENTS.—STRUGGLER says: "In looking at some bromide enlargements the other day, I noticed that either before or after working up the surface had been treated with a coat of some gummy substance, which, to my mind, considerably improved it, taking away the rather deadly dullness of the ordinary bromide print. Could you tell me what preparation that was, and how applied?"—Without seeing one of the pictures, it is impossible to suggest what it was coated with. It is not usual to coat bromide pictures with anything. Of course, they may be varnished with any of the paper varnishes. If you send us a specimen to see, we may very possibly enlighten you.

PAINT FOR BACKGROUNDS.—BACKGROUND asks for the name of the washable water paint or distemper that is so much in use by background painters and the best place to obtain it.—First paint the background with ordinary oil colour, the tint desired. Then flat it. The flattening is the same as the paint, except that the oil is omitted, it being simply mixed with turpentine and a little gold size. If you cannot mix the paint and flattening yourself, any oilman will make it up for you.

SENSITIVENESS OF BITUMEN.—E. X. P. T. asks: "Is there any difference in the quality of sensitiveness of bitumen of Judea? I have bought some at an oil shop that seems to be quite insensitive."—The sensitiveness of bitumen varies with different samples. Sometimes what is sold at oil shops as bitumen is common pitch. Better get some from a dealer in photographic materials; you will then obtain a suitable kind. Messrs. Mawson & Swan supply a kind specially prepared for photographic purposes.

REFLECTING LIGHT IN STUDIO.—OPERATOR says: "Our studio has an unobstructed light from the sky, both top and side. What I wish to know is, whether a reflector, placed outside, will throw any more light into the room than will be beneficial by shortening the exposure?"—As there is an unobstructed skylight all round, there will be no practical advantage from a reflector; in fact, it would at times create difficulties. The case might be different if the studio were surrounded by buildings that cut off some of the direct light.

STEREOSCOPIC PORTRAITS.—HAMPSHIRE writes: "I wish to try and introduce stereoscopic portraiture in my business. Will you please advise me as to the best lenses to get for studio work? R.R.'s would, I think, be too slow, particularly with children."—The most suitable lenses would be a pair of *carte-de-visite* lenses of about six inches equivalent focus, or a pair of stereoscopic portrait lenses, such as are supplied by Dallmeyer and others. The former will enable the camera to be placed a little further from the sitter than the latter, but both will be good.

REVERSING MIRROR.—INVERTED writes: "Kindly tell me at what angle a reversing mirror, for taking reversed negatives, should be placed with regard to the lens; also whether it should be before or behind?"—The mirror should be at an angle of 45° to the lens. It is usual to fix the mirror in front of the lens, though in some of the larger houses on the Continent it is placed behind. In the latter position, being inside the camera, it is the better protected from injury. Practically, one position is as good as the other so far as results are concerned.

LENS FOR DIFFUSION OF FOCUS.—S. MINTON writes: "I have been told that the front lens of a portrait combination, Petzval form, can be used for taking portraits with diffusion of focus. I have one about three and a half inches in diameter. Will you please tell me how it can be used for the purpose?"—Remove the back combination, and screw the front one in its place, convex surface towards the focussing screen. With its full aperture the lens will yield much "diffusion"; but, as its aperture is reduced by stops, the image will become proportionately sharper and sharper.

INTENSIFYING VARNISHED NEGATIVE.—T. BARNARD asks: "Is there any known way of intensifying a negative that has been varnished?"—Nothing can be done in the way of intensifying it so long as it is in its varnished state. The varnish must be removed first. This may be done by soaking it in strong methylated spirit—that is, supposing it is a spirit varnish—for an hour or so, then gently rubbing it with cotton wool. This treatment may have to be repeated two or three times to free the film from it, and it must all be got off, or stains will result. When the varnish is removed, the negative may be intensified by any of the well-known methods.

BLINDS FOR STUDIO.—PYRO asks us to advise him as to the best material for sufficiently subduing the sun's rays in a studio. "Ordinary white calico is not thick enough, do you know of any material with a texture similar to tissue paper, which there is nothing to beat that I know of? But the bars holding the glass are iron, and it is difficult to attach frames with tissue stretched on. When a photographer is busy he cannot be getting a ladder and lifting frames down as the light fluctuates. Could you also tell me if there is any tissue paper manufactured that remains white for a reasonable time? the paper I have used turns yellow in a day or two."—Tracing linen, which may be had from any of the dealers in artists' materials, answers the purpose admirably. It may be strained on light wood frames, and these hinged to stout laths fixed to the ridges and eaves of the studio. Then, by means of cords, they may be adjusted at any angle, according to the light.

SHADOWLESS PHOTOGRAPHY.—P. P. P. says: "As 'shadowless' photography seems much used in advertising, can you inform me how it is done, or recommend a work which deals fully with the subject, or school, or polytechnic, where this particular branch is taught? Have read the article in the current number of the ALMANAC, which seems feasible enough for botanical specimens and similar subjects, but how to arrange the components of machinery, and things of like nature, showing them in perspective one above another, without the slightest sign of shadow or reflection, as shown in enclosed rough print, is puzzling to me. Have spent a great deal of time experimenting, but cannot succeed satisfactorily, my failures far exceeding my successes, which latter are only attained by an expenditure of much time and labour."—The article referred to is very explicit, and you will see from it that Messrs. Sharp & Hitchmough supply an apparatus specially for photographing objects by a vertical light, which would be suitable for such objects as are shown in the photograph sent. Messrs. Dallmeyer also supply an apparatus for a similar purpose. In photographing machinery and the like, the shadows are softened by the judicious use of reflectors. There is no work published on the subject; but any expert photographer would, no doubt, give you instructions in it.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÀ.

THE preliminary announcement of the Fifteenth Annual Meeting of the Photographic Convention of the United Kingdom has been issued. The meeting will be held at Newcastle-on-Tyne, in the week July 9–14 next, under the presidency of Mr. Thomas Bedding, F.R.P.S., Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY. The Grand Assembly Rooms have been engaged by the Council for the meeting. The members will be officially welcomed to the city by the Mayor of Newcastle-on-Tyne, Mr. Riley Lord, who will be supported by an influential Reception Committee, the officers and members of the Newcastle and Northern Counties Photographic Association and neighbouring photographic societies. A most attractive programme of excursions has been arranged, including Hexham ("The Heart of all England"), the Roman Wall, Durham, Alnwick, Hulne Abbey, &c., &c. An afternoon reception will be held at that picturesque spot, Jesmond Dene, by Mr. G. B. Bainbridge, J.P., President of the Newcastle and Northern Counties Photographic Association. Short excursions will also be arranged to the many places of interest in and around the city, and permission, where necessary, will be obtained for

members to take photographs of its many historical churches, public buildings, &c. Papers, demonstrations, lantern exhibitions, &c., will be given during the meeting. The usual trade exhibition will be held. The entire ground floor suite of the Grand Assembly Rooms has been secured, and it is anticipated that an unusually interesting display of apparatus, pictures, &c., will be on view. The official reception and annual dinner will be held in the upper suite, so that on these occasions the entire building (which is lighted throughout by electricity) will be at the disposal of the members. Further information as to hotels, time of trains, trams, Tyne steamboat service, plans of Newcastle, Jesmond Dene, &c., will be given in the official programme, which will shortly be issued.

* * *

AN unknown friend has been good enough to send us some excellent views of Jesmond Dene and Durham, which will be visited by the Convention. These and the other beautiful places mentioned in the previous paragraph will furnish very fine opportunities for photographic work amidst picturesque and historical surroundings. The detailed arrangements for the week are practically complete, Mr. F. A. Bridge, the General Honorary Secretary and Treasurer, having already visited Newcastle-on-Tyne and conferred with the local Committee on the subject. This body is entering so heartily into the matter, that the remarkable attendance of forty was present at the last meeting to discuss preliminary details. The local Honorary Secretary, Mr. William Thompson; the famous pictorial photographer, Mr. Edgar G. Lee; the highly esteemed Mr. J. Pattison Gibson, of Hexham; and the President of the Newcastle Photographic Association, Mr. Bainbridge, amongst many others, are taking the liveliest interest in the forthcoming visit of the Convention, the members of which may look forward to a well-arranged week. All the signs point to a successful meeting, and it is to be hoped that a very large attendance of members will take advantage of the earnest efforts which thus early the good people of Newcastle-on-Tyne are making to ensure that the 1900 Convention will be pleasant and profitable to all interested in it.

* * *

THE Executive Committee of the Affiliation of Photographic Societies are calling another meeting of the Conference of

Judges to consider certain suggested modifications in the rules and recommendations adopted in 1895, and we are asked to announce that any person who has acted in the capacity of a Judge at an exhibition having open classes is invited to attend. The conference will take place at 66, Russell-square, on Wednesday, April 11, at seven p.m. Copies of the rules now in force and of the suggested modifications may be obtained, by those who do not receive them in the ordinary course, on application to Mr. A. W. W. Bartlett, Secretary. The following are the proposed rules: 1. The Judges' decision shall be final. 2. The Judges shall have full power to withhold any award. 3. The Judges shall have power to exclude all persons from the room while judging. 4. The Judges' expenses shall be paid. 5. It shall be stated in the prospectus that the awards are placed "in the hands of the Judges," or "at the discretion of the Judges." 6. The Judges shall not adjudicate upon pictures exhibited as produced with wares of special trading firms. 7. Where there is a champion class, pictures which have previously taken awards in open classes shall be exhibited in the champion class only. 8. An award shall be made to one picture only, whether it is in print, lantern slide, or other form. 9. There shall be no distinction between amateur and professional.

* * *

FURTHER proposed rules are: 10. No production of any kind whatever from the same negative shall receive more than one award, except as defined in rule 7. This includes lantern slides, enlargements, &c. 11. No award shall be made to a lantern slide until it has been projected on the screen. 12. It shall be stated on the entry form to what extent the work sent for competition is that of the exhibitor. 13. That the names of those who have consented to act as Judges shall be printed in the prospectus of the Exhibition. 14. No award shall take the form of a money prize. The following are the proposed recommendations: 15. The names of the competitors should be withheld from the Judges. 16. The Judges should have power to give extra awards where they may think fit. 17. In order to enhance the value of awards, their number should be limited. 18. The Exhibition Committee should not accept offers of awards from trading firms. 19. The number of awards should be kept as small as possible. 20. No exhibit at the same Exhibition should receive more than one award. Upon the foregoing proposed rules and recommendations, as well as upon some suggestions that have been made to the Committee, considerable discussion may be expected. In the last five years the growth of feeling in favour of the abolition of medals at exhibitions has been very marked, and we may expect this fact to have some influence in the deliberations of the Conference of Judges next month.

* * *

LANTERNISTS, and others interested in optical projection, should acquaint themselves with the new by-laws of the London County Council, which have been approved by the Home Secretary, governing the public exhibition of flash and search lights. Apparently drawn up in the interests of the traffic and inhabitants of the greatest and most crowded city in the world, it remains to be seen how far they will secure general approval. They are as follows: No person shall exhibit any flash light so as to be visible from any street and to cause danger to the traffic therein, nor shall any owner or occupier of premises permit or suffer any flash light to be so exhibited

on such premises. The expression "flash light" means and includes any light used for the purpose of illuminating, lighting, or exhibiting any word, letter, model, sign, device or representation in the nature of an advertisement, announcement or direction, which alters suddenly either in intensity, colour, or direction. No person shall exhibit any search light so as to be visible from any street and to cause danger to the traffic therein, nor shall any owner or occupier of premises permit or suffer any search light to be so exhibited on such premises. The expression "search light" means and includes any light exceeding 500-candle power, whether in one lamp or lantern or in a series of lamps or lanterns used together and projected as one concentrated light, and which alters either in intensity, colour, or direction. Any person who shall offend against any of the foregoing by-laws shall be liable for every such offence to a fine not exceeding 5*l.*

* * *

PROFESSOR R. W. WOOD, of Madison, Wisconsin, U.S.A., who recently delivered before the London learned societies a series of deeply interesting lectures on zone plate photography, the photography of sound waves, and his own remarkable process of colour photography with diffraction gratings, has returned to America. Previously to his departure he saw another notable experimenter in colour photography, Professor Lippmann, of Paris. Professor Wood tells us that he was amazed at the progress Lippmann has made in his interference process. "His landscapes are beautiful, the colours being as vivid and as true to nature as in a well-executed colour slide, sometimes superior." Professor Wood judges that Lippmann has a much larger percentage of successes than formerly. With regard to Professor Wood's process, we trust that those British experimentalists who are qualified for the work will not neglect to give it early attention. Of the four pure spectrum colour processes, if we may so term them, now before us, Professor Wood's most readily admits of the multiplication of copies, and deserves special notice on that account.

* * *

MESSRS. C. ARTHUR PEARSON'S *Royal Magazine* for April strongly appeals to the notice of the devotees of stereoscopic photography. Its first article, "Following a War with the Camera," is illustrated by the halves of binocular photographs taken by Messrs. Underwood & Underwood during the late Spanish-American War. The writer of the article pays a great compliment to Messrs. Underwood for their enterprise and courage in securing these and other war stereographs. Another feature of the *Royal* consists of a couple of pages of British military stereographs, which are excellent. The publishers of the *Magazine* supply a stereoscope for viewing these photographs for two shillings. We have so often advocated stereoscopic photography for purposes of book-illustration that it is needless for us to repeat our ideas on the matter. It is enough to say that we are pleased to see binocular work so largely drawn upon by the conductors of a popular magazine like the *Royal*.

* * *

We learn from Messrs. Underwood & Underwood that their stereoscopic photographer is at work on the South African battlefields, and, though, like most other correspondents and photographers, he has met with great difficulty in his progress, a large set of war stereographs will result from his efforts. The Queen's forthcoming visit to Ireland will also furnish Messrs.

Underwood with the opportunity of procuring a set of stereographs illustrating scenes in the sister Isle while the Sovereign is there. There appears to be no limit to the energy of this house in making stereographic records of current events and remote parts of the globe, over most habitable parts of which their operators appear to have travelled. Of course, Messrs. Underwood stand in no need of commendation from us, whose interest in the subject of stereography *per se* is our excuse for these references. The fact that a single house has built up a vast business in binocular work shows that this branch of photography is greatly appreciated by the general public, and causes us some surprise that it is not taken up with greater spirit by professional and amateur photographers.

* * *

THE new Copyright (Artistic) Bill has at last been issued. We reprint elsewhere the essential parts of the Bill, which this week was to be read a second time in the House of Lords, and referred to a select committee, consisting of the Lord Chancellor, the Earl of Selborne, Viscount Knutsford, and Lords Balfour, Hatherton, Monkswell, Thring, Farrer, Welby, Davey, and Avebury. The new Bill differs in many vital respects from the measure which was introduced to the Lords last year, and which, in the reasonable apprehension, following upon the meeting held last month at the Society of Arts, that it was to be brought up again this year, has been so severely criticised in our pages during the past few weeks. Lord Monkswell's new Bill proposes to give copyright in photographs for life and thirty years afterwards; is entirely silent on the subject of registration, compulsory or otherwise; defines photography as "artistic work;" provides that the owner of a negative shall be deemed to be the author; simplifies the "valuable consideration" clause, and in other respects, at the first glance, is distinctly sympathetic towards photography—as sympathetic, indeed, as the Act of 1862. But that the Bill in its present form will pass is premature to expect, for, as a result of its reference to a select committee, it may possibly assume a far less objectionable shape. We shall follow its career through Parliament with interest; in the mean while it is satisfactory to know that the Bill on another page, which bears Lord Monkswell's name on its back, does not, so far as we are able to interpret its provisions, attempt to treat photography in the penalising, spoliative, and degrading manner which the notorious St. John's Wood Bill, that we have so often denounced, manifestly intended to do.

EARLY DRY PLATES AND PLATE BACKING.

As evidenced by letters we have received regarding our remarks on this subject a short time ago, some little elaboration of what we then wrote is likely to be of interest to our readers. We will deal first with what we may term the historical part of our subject, as referred to by Col. Mitchell. *En passant*, we may say that it is quite refreshing to hear from a "wet-plate man;" so vast have been the strides made by photography in the past two decades that there is already quite an archaic flavour about references to the old days of silver baths and collodion. As our article had no accurately historical aspect, we did not deem it necessary to particularise by name the plates we referred to. But Col. Mitchell is quite right; the plates indicated were, to speak exactly, urano-bromide emul-

sion process plates, as invented by Colonel Stuart Wortley, and we can further bear testimony to their excellence, as testified by our correspondent. They were a collodion emulsion plate, and at the time had a great run, though eventually every plate of the kind was virtually extinguished by the advent of the gelatino-bromide plate. The film of these uranium plates was thin, and so the protection of a backing was a necessity. It may here be worth noting, as an historical reminiscence, that the details of the process were made public by Colonel Stuart Wortley at the first meeting of the Dry Plate Club, the President of which was no less a dignitary than the Archbishop of York.

But as regards to their being "the best, if not the only workable, dry plates placed upon the market prior to the advent of gelatino-bromide plates," we can scarcely give our adhesion to that opinion. Collodio-albumen plates had been many years in use and purchasable in open market, but even presuming that plates of comparative rapidity were meant, collodio-albumen being very slow, we might point out that, prior to the Wortley plate, there were, as a reference to the advertisement columns of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1871 and 1872 would show, many makes of acknowledged repute. Thus in these pages may be seen advertisements of "Pollitt's Dry Plates," "Russell's Rapid Dry Plates," "The Liverpool Dry Plate Company's Plates." In addition to these may be mentioned a plate of the highest quality, which already at that time had enjoyed for years a high reputation and large sale—the "Hill Norris Dry Collodion Plates." It is a fortunate thing that what we have written has given an opportunity of bringing to the notice of the modern votaries of photography that "there were giants in those days."

It was fairly well recognised in those days that reflection at the back of the plate formed a source of evil which was termed indifferently, even by experts, "blurring," or "halation," though at the present time the latter term is practically exclusively used. Still, the cause of halation was, and had been for years, a constant subject of discussion in the pages of this JOURNAL, and the matter was brought to a focus, as it were, by Sir W. Abney (Major Abney then), in a paper read before the Royal Photographic Society, in which he clearly proved the cause of halation, and gave a mathematical formula for its extent dependent upon the thickness of the plate, a method which has been of considerable use in gauging star magnitudes on dry plates.

With regard to the use of dark-paper backing for wet plates to avoid this defect, we may say that, not only have we used it for the purpose, but have also successfully employed black American cloth, temporarily attached (after previously wiping the plate) with glycerine. With regard to the slowing of plates by backing, our experiments are conclusive and not to be gainsaid. Mr. A. J. Brown saw in the plates he had taken evidences of slowing, but which were slight. "Dirt" was said by Lord Palmerston "to be matter in the wrong place;" the unbacked portion of Mr. Brown's plates simply had light in the wrong place, which might easily deceive as to its true meaning.

If our correspondent had had as much experience as we have in the ways of experts in manufacturing, when legal tests were being made, the British legal standard of comparison for illumination, the "Standard candle," he would give his opinion far more modestly in regard to the value of the source of illumination we adopted. "A naked gas flame" (protected goes

without saying) "burning at a constant pressure" cannot be used as a general standard of comparison; but, as a particular standard on a particular occasion, it can be trusted to one-hundredth per cent. "Daylight" and "magnesium" are unscientific and untrustworthy standards.

Embryonic Heart Movements.—Professor G. Farro contributes to the *Bulletin della Soc. Fot. Italiana* an interesting paper detailing his experiments in the registration of the movements of the heart of an embryo chick, three days after the formation of the same. The egg, kept at a constant temperature, was placed on the stage of a microscope, and sunlight projected through it by means of a heliostat. The image formed by the objective is sent by a prism into a camera at the same time as the image of a Koenig tuning fork vibrating at a constant rate on to a sheet of bromide, moving at a constant rate behind a fixed slit. The illustration is interesting and conclusive as to the regularity of the movement, and the author suggests that there is here a new field opened up by the aid of photography in embryology.

Gallic Acid in Developers.—Dr. Lüppo-Cramer, of Charlottenburg, has been experimenting with the addition of gallic acid to certain developers, and he finds that two and a half per cent. added to a metol-potash developer slows it so much that the mixture acted exactly like a slow developer, the high lights appearing first, then the half-tones, and finally the shadows, and that the negative, when compared with one developed with metol without the gallic acid, showed a somewhat browner colour but quite sufficient printing density, whilst that developed with metol alone was thin and useless. Subsequent experiments proved that the image partly consisted of oxidation products of the gallic acid, but these were not sufficient to account for the whole of the increase in density, and that the gallic acid certainly increased the developing power. With pyrogallop, hydroquinone, and para-amidophenol, gallic acid acts merely as a very powerful restrainer, and, in the case of hydroquinone, so strongly as to almost prevent development at all; with amidol, whilst slowing the developer, it increased the density-giving powers. The strong colouring matters formed in alkaline gallic acid solution, which cannot be prevented by enormous additions of sulphite, preclude any practical use being made of it. There is an interesting point in connexion with this experiment, and that is, although gallic acid will reduce precipitated silver bromide instantly to the metallic state, it is unable to act as a developer on emulsified silver bromide.

To the North Pole.—We read that the *Windward*, the vessel presented by Mr. Alfred C. Harmsworth, in May 1898, to the Arctic explorer, Capt. R. E. Peary, is to be rebuilt and re-engined at a cost of forty thousand dollars, this expense being borne by the Peary Arctic Club. The Committee of Commerce of the United States Senate has reported a bill granting a register to the vessel, which is English-built. The register is sought that its enterprising owner and his American friends may have the patriotic reward of carrying the "Stars and Stripes" in an American ship to the North Pole. Nearly every country has had the same ambition, and it will be interesting to see which, if any, will be the first to reach the goal. In all recent expeditions photography has been a feature, and we know that in all future ones it will not be neglected.

The National Gallery.—The Annual Report of the Director of the National Gallery (Sir E. J. Poynter), for 1899, issued last week, contains some interesting details. From it we see that during the year the Gallery has acquired five fresh works, including two fine Rembrandts, purchased by the Trustees from Lord Saumarez for 15,050*l*. A special grant for this purpose had to be obtained from the Treasury, and it was only granted upon condition that the Trustees should forego the annual grant for 1899–1900, estimated at

5000*l*. The Government certainly cannot be charged with over liberality in the sum annually granted for the acquisition of fresh pictures for our national collection. If it were not for private donations, this country would fare badly by comparison with some Continental ones. Not the least interesting part of the Report, as showing how art is appreciated in our capital, is the number that visits the National Gallery. It shows that during the year 1899, on the free days, the Gallery in Trafalgar-square was visited by 420,272 persons, giving a daily average of 2040. In addition to this number the Gallery was visited, on the thirty-one Sundays it was open, by 35,226 people, or an average of 1136 per day. The number of visitors on students' days, when the admission is sixpence, shows a marked increase on that of 1898. At the Gallery of British Art, the Tate Gallery, at Millbank, there were, on the free days, 177,420 visitors, giving a daily average of 857. On the thirty-one Sunday afternoons this Gallery was open it was visited by 36,726 persons, an average of 1184 daily. It is noteworthy that the Sunday admissions to the Trafalgar-square collection were but a little more than half the number of the week-day average; whereas, at the Millbank Gallery, it was nearly fifty per cent. more. This would tend to show that the Sunday visitors have a preference for British art over that to be seen in the older building. The Sunday opening, during the summer months, of the national collections of pictures gives photographic employés who are engaged during the week the opportunity of seeing and studying the works of the finest masters, old and modern; but it may be a question as to how many really avail themselves of it.

Enlargements versus Direct Negatives.—We notice, from the report of a recent meeting of the North London Photographic Society, that the oft-discussed theme, "Direct Large Pictures versus Enlargements from Small Negatives," was once more to the fore. This question has formed a fruitful topic for discussion before the different photographic societies during the last three or four decades, and will, doubtless, continue to do so, for, as a matter of fact, both systems may be the better, according to circumstances. It is generally conceded that there is a charm or a certain something about a print from a direct large negative that is not obtainable in an enlargement from a small one. But that does not hold good in all cases. Take, for example, a portrait 15×12. If that be taken direct with a suitable lens for the purpose, which, as we have pointed out on previous occasions, should not be less than twice the focal length at least of the longest dimension of the plate, namely, thirty inches, it will be to most people more pleasing than an enlargement from a small negative. But, on the other hand, if it be taken with a lens such as is too often used for the purpose, which, though it will cover that size plate according to the catalogue of its maker, is of, say, only eighteen or so inches focus, the case will be different. Here the camera has to be approached so close to the sitter that the perspective, though true, is violent, and the picture, though technically excellent, will be very unpleasing. Here an enlargement from a small negative, made with a lens of double the focal length of the plate, will be the better, notwithstanding that it may lack the special charm of a direct picture. We merely allude to these facts to show that, in considering the question of enlargements *versus* direct pictures, so much must necessarily depend upon conditions.

THERE is one thing that materially militates against enlargements in the eyes of some, and that is the coarseness of the grain in the original negative. This, in the case of some extra-rapid plates, especially when they are under-exposed and forced in the development, becomes very conspicuous in the enlargements, and gives quite a different appearance from that seen in a direct print. This may to an extent be greatly ameliorated in making the enlargement by putting the lens slightly, very slightly, out of focus. That, if judiciously done, will not materially affect the general sharpness of the picture, while it will greatly avoid the granularity. We were, some time ago, shown several enlargements made from old 10×8-wax-paper negatives to about double their size in which this system

followed. The result was that the granularity seemed to be very less apparent than it was in the direct prints from them, though the general sharpness of the pictures did not seem to be impaired in the slightest. This may be a useful hint to those making arrangements from very granular negatives.

Photogravure in Practice.—At the last Photo-mechanical meeting of the Royal Photographic Society the topic of the evening was photogravure, and Mr. Ignatz Herbst, who brought the subject forward, remarked that photogravure was quite useless as a commercial process without skilful and artistic work on the plate, and was in this particular that the method was essentially not a mechanical one. A speaker, however, expressed the opinion that he did not think that the artistic character of the process was enhanced by retouching; in fact, he was of the contrary opinion. That opinion was not, we know, endorsed by any one who has to do with commercial photogravure. Even the best photogravure plates that are possible require a certain amount of very skilful hand work to render prints from them marketable. That hand work must be done by a skilful engraver, and one who can thoroughly carry out the artist's idea as to how his painting should be translated into monochrome. The publisher and those for whom he caters have also to be satisfied, for it must be borne in mind that in the market photogravures are not looked upon in the light of photographs, but as ravings, and the closer they are made to resemble them the greater is their commercial success. Those who purchase photogravures would not have them if they could obtain good line or mezzotint ravings of the same subjects, even if they had to pay a somewhat higher price for them. But, alas! they are not obtainable. The line and mezzotint engravers have died off, and there are no new ones to take their place. This is not altogether surprising, when it is considered that a photogravure plate can be produced in a much shorter time than by the older methods.

WITH regard to the printing from the plates in colour, it will be remembered that some weeks ago we mentioned that we saw this work being done in a Continental house some time ago, and that a man could only produce from two to three impressions per day. At a meeting General Waterhouse also mentioned that he had witnessed, in Paris, colour printing, and there only two impressions a day were obtainable. Mr. Herbst said that, with the large prints showed, half a dozen men were engaged at the same time in inking up a plate, and that the work took a couple of hours; so it will be seen that colour printing from intaglio plates is necessarily a slow process. One of the speakers (the Rev. F. C. Lambert) said that, when he endeavoured to apply the ink locally, he invariably found that, in wiping the plate, the ink was shifted and smeared. Now, it is just this condition that enables the skilful printer to extend the tints, which he could not well otherwise do, and he takes full advantage of it. Colour printing from intaglio plates requires great and artistic skill in order to obtain the best results. We regret to hear from Mr. Herbst's colleague, Mr. Reichs, that he could not get suitable men for the work in this country, and that, therefore, he had to get them from the Continent.

ABOLISHING THE DARK ROOM.

was with much pleasure I read a paper on the above subject by Mr. Howard Farmer at page 803 of THE BRITISH JOURNAL PHOTOGRAPHIC MANAC for 1900.

Seeing, however, that the actual dyes, or other agents, found by Mr. Farmer to yield the brightest safe light are not stated in that article, I forthwith got my tin lamp altered so that glass tanks could be slid into grooves in place of coloured glasses on two sides of the lamp, and got two caps fitted so as to exclude all light except what passed through the solutions in the tanks. The lamp being ready, I procured at a very cheap rate all the aniline dyes sold in the bazaar, both here and in Bombay at the chemists' and colour shops, and commenced a long series of experiments to find out the best thing to use as a light filter. Being

a medical man, I had in hand several drugs and chemicals yielding coloured solutions, and these I tried also. Of course, I tried, among a heap of other things, the thirty-grain solution of quinine (suggested by Mr. E. Dunmore in your annual), both singly and in combination with various yellow and other dyes. The results of each experiment were tabulated, and they occupy several sheets of foolscap paper. To describe all the things which proved utterly useless would occupy much space, and would be of no interest to the readers of the JOURNAL. I will merely state that the very best results were obtained with eosine in combination with metanil yellow. I need hardly mention that the object of the experiments was not merely to discover what articles gave a safe light, because a safe light was found to be given by almost every dye and chemical which was capable of producing orange or ruby solutions. The object in view was to find an absolutely safe and yet a brilliant light of the palest yellow colour possible, because the paler the yellow the brighter and more pleasant the light is, and the redder the light the worse it is in every way. It was considerations of this kind that made me prefer eosine to aurine, erythrosine, and many other dyes, which give, in very dilute solutions, a redder colour than eosine, and which are, notwithstanding, very much less efficient, weight for weight, if used simply in solution.

If you prepare three solutions, say, of aurine, erythrosine, and eosine, each containing three grains in twenty-four ounces of water, the last-mentioned will be found to be out-and-out the best as a light filter, though the eosine solution was the palest red of the three. I mention this to show that it would be useless to add anything to the formulae below given to make the light just a little redder. The feeling exists among many, especially beginners, that a dark room is no use unless it be dark, and the light never safe enough unless it be ruby or red, or, at least, deep orange; but all that is changed now, thanks to Mr. Farmer's discovery, and now we must say that a dark room is no use unless it be brilliantly lighted, and the light of no use unless it be of a pale yellow or lemon colour. Some will, no doubt, say, "Oh, let us add a little more eosine, at all events." And to this let me answer, "Please, don't," because the brightness of the light would suffer thereby.

After finding out that eosine and metanil yellow were the best things to use, I tried these in combination in several proportions, and the formulae below given show, as far as I at present know, the best proportions to give the brightest light compatible with absolute safety:

1.

Eosine	1 grain.
Metanil yellow	12 grains.
Water	48 ounces.

This solution is absolutely safe for rapid plates developed at one-and-a-half feet distance from the flame of a stearine carriage candle.

2.

Eosine	$\frac{1}{2}$ grain.
Metanil yellow	6 grains.
Water	48 ounces.

This is perfectly safe for ordinary plates at one-and-a-half feet distance from the flame for commencing development.

3.

Eosine.....	$\frac{1}{4}$ grain.
Metanil yellow	3 grains.
Water	48 ounces.

This is suitable for all bromide papers developed at one foot distance, and for ordinary plates at two feet distance.

The last formula gives quite a glare of beautiful and brilliant light, and experienced photographers, who know the use of the broad of their backs to shield a naked plate from any prolonged direct light, and who commence development either at a suitable distance or on one side of the lamp, will find this formula quite safe enough for all purposes, excluding, of course, orthochromatic plates. I have often developed very rapid plates with formula No. 3 without any trace of fog resulting, but with such plates a little care of the kind above indicated will be found necessary with that formula.

I ought to mention that many kinds of eosine are to be found in the shops. They all have one peculiarity, viz., that if you put an eosine solution of any strength in a tumbler or bottle, and let sunshine or lamp light fall on it, there will be seen on that side of the vessel where the light impinges, as also on the surface of the fluid, a bright green or bluish-green colour, or fluorescence, though the fluid itself is either a ruby, an orange, or yellow colour according to its strength. Some eosines show this fluorescence more than others, and that sample which shows the most will be found the best for use as a light filter.

Again, some eosines are yellow in very dilute solutions, and some, not yellow, but pink or red. That sample which in very dilute solutions is the least pink and the most yellow, and in strong solutions the purest ruby instead of red, will be found the best to use.

As for metanil yellow, which like many useful things comes from Germany, this also comes in a great variety from places like the Badische Anilin and Soda factory. The one I prefer for its bright and clear orange solutions, containing absolutely no turbidity, is of the quality marked on the packets as No. B.K.H. 74. There are two or three metanil yellows which yield deeper orange or golden yellow solutions, but, as they show a slight turbidity with cold water, I rejected them, because the light would vary as the sediment fell to the bottom. Nothing that yields the faintest turbidity in cold water should be employed as a light filter.

Possibly in some of the smaller towns eosine may not be procurable, in which case it should be ordered out by post, and in the mean while the following formula used:—

Caramel	8 grains.
Metanil yellow	12 "
Water	48 ounces.

This can be used at one foot distance for ordinary plates, and at one-and-a-half feet distance for rapid plates. For bromide papers this solution should be diluted to double its bulk with water. It will be understood from the above that I do not recommend this caramel (or burnt sugar) formula if eosine can be procured, as the eosine formulæ I have offered above give a much more brilliant and pleasant light. K. B. COOPER,

March 6, 1900.

Assistant Surgeon, Ahmedabad.

A CAUSE OF UNSHARPNESS IN HAND-CAMERA PICTURES.

An unsuspected cause of lack of sharpness in some hand-camera negatives has just come under our notice. The facts are these: The camera is one of the fixed-focus type, or, we should say, rather one in which the focussing is done by scale, and with a rigid, not bellows, body. The lens is one with a wide aperture, f·5·6, and is beyond reproach. When the apparatus was used last season, it was all that could be desired, but, when recently taken into use again, all the negatives proved to be unsharp—palpably out of focus—and it was found, by trial, necessary to rack the camera within about the twentieth of an inch of the normal point, according to the scale, to get a sharp negative, that is, when the lens was worked with its full aperture. A week or so later things went wrong again, or, perhaps it would be more correct to say, got right again as they were originally, for it was found that it was necessary to adjust the focus to the exact point on the scale in order to get a sharp picture. The explanation, when the cause was found, is simple. It is this: During the winter months the apparatus was stowed away in a lumber-room at the top of the house, that was not particularly dry, and which never had a fire in it; consequently the wood in the camera had become expanded sufficiently to throw the lens out of its sharpest focus. But after the apparatus had been in use out of doors on a few dry, sunny days, and was kept when not in use in a room in which a fire was generally burning, the wood contracted to its original dimensions.

We call special attention to this case because it may serve to illustrate what may occur in others. Many of the cheaper kinds of hand cameras are made of anything but the best seasoned wood. As a rule, they are constructed with the grain of the wood running at right angles to the length of the camera—the direction of its greatest expansion and contraction. Now, it can readily be conceived that such a camera is very likely to show a variation if it is carried for several hours in a hot burning sun, or is subjected to an hour or two's rain—conditions that all hand cameras are at times subjected to. It should be mentioned, however, that the slight variation, due to the expansion and contraction of the wood, is only appreciable when lenses of wide aperture are employed; with those of smaller aperture it is quite a negligible quantity.

REDUCING OVER-PRINTED PROOFS.

WE notice in the report of one of the London societies, the London and Provincial, that a bromide enlargement that was worthless on account of an ill-timed exposure was shown after it had been toned with copper. The producer said that the result "was a very fair print, with an apparent reduction of the dense parts and an intensification of the details in the high lights." One speaker expressed the opinion that the

improvement in the picture was due simply to the alteration of colour by the copper toning. Another gentleman said that the tone of the print shown could not be said to be altogether an improvement, much as the normal colour of a bromide enlargement was more suitable for the subject of the photograph. Now we are frequently asked, through the Answers column, for a method of reducing over-printed prints. There are several ways by which pictures printed too darkly may be reduced, but the practical question arises as to whether, except a experiment, the result when attained is worth the time and trouble expended upon it; in other words, "Is the game worth the candle?" We say, No.

It is an easy matter to make a fresh print from a negative if found, when taken from the frame, to be too light or too dark, and trouble in doing it is infinitely less than any after-treatment when picture is finished to make it presentable. The same also applies to enlargements. It takes less time to make a fresh one than to attempt to vamp up an ill-timed or over-exposed one. Again, as to cost, it will be found in practice, if time is of any value, that it is far more economical to make fresh pictures than to expend time on attempting to reduce under or over-timed ones. Even if the attempt is more or less successful, the colour of some of the pictures is invariably different from that obtained in the first instance, while with some methods its permanence is not so doubtful. The practice with professional printers is, when a print is under or over-printed, to at once throw it amongst the waste. This is also the custom with professional enlargers, and they, of course, follow this practice as a matter of economy. Still, the different methods of reducing or intensifying faulty prints or enlargements are exceedingly interesting to the experimentalist.

PHOTOGRAPHING AT THE PARIS EXHIBITION.

FOR once the regulations made with regard to taking photographs in exhibition seem to give pretty general satisfaction. In a recent issue of the *Moniteur de la Photographie*, we gave, on the authority of the *Moniteur de la Photographie*, what will be at the forthcoming Exhibition in Paris. Since then—Tuesday March 12—the Minister of Commerce has issued authoritative regulations under which photographs may be taken within the precincts of the Exhibition, and they differ somewhat from those published in the *Moniteur*. They are these: The use of hand cameras will be permitted at all times free of charge or restriction, but the use of apparatus standing on a tripod will only be allowed up to one o'clock in the day. In addition, this class of photographers must obtain a written permission from the Commissioner-General, and pay a fee, which has been fixed at twenty-five francs for one day, or a thousand francs for the period of the Exhibition. Photographers will, however, be subject to the following regulations: "No exhibit may be photographed without written authorisation of the exhibitor. The interested persons must obtain from the Foreign Commissioners-General or Concessional authorisation to reproduce their palaces or pavilions. They assume responsibility for the reproductions they may make, and guarantee the Administrators of the Exhibition against all claims."

We mentioned just now that the regulations give pretty general satisfaction, and so they undoubtedly do so far as the unrestricted use of hand cameras throughout the day is concerned. Twenty-five francs a day, however, may not be too much for professional photographers using large apparatus to pay; but that sum—equal to one pound English—will certainly deter many amateurs from using a small stand camera, particularly as the day's use does not extend beyond one o'clock. Imagine, however, that amateurs will be thankful for the free use of hand cameras at all times without let or hindrance.

By the way, there seems to have been some little friction amongst the Selection Committee of the Salon with regard to the reception of number of certain pictures, for we read that one of its members—M. Benjamin Constant, a well-known artist—has sent in his resignation to the body through his disagreement with his *confrères* on that subject.

SIMILI-PLATINE PAPER.

UNDER this name M. Van Loo recently introduced before the Association Belge a paper which might be considered a modification of Nicol's calotype. The sensitising solution is composed of—

Ferric oxalate	15 grammes.
Oxalic acid	3 "
Silver nitrate	3 "
Water	100 c. c.

is quantity is sufficient to sensitise a dozen sheets of paper 50 x 60. The paper is printed exactly like platinotype—that is, till the image distinctly visible only, and it is then developed by immersion in—

Borax	60 grammes.
Sodium tartrate	60 "
Water	1000 c. c.

increase contrast and obtain pure whites, a few drops of a five per cent. solution of potassium bichromate should be added to the above. After development, which takes five or six minutes, the print should be well shed in running water, and then toned in—

Potassium chloro-platinite	1 gramme.
Citric acid	10 grammes.
Salt	10 "
Water	1000 c. c.

the desired tone is obtained, and the print should then be immersed five minutes in a two per cent. solution of ammonia, and washed.

THE NEW COPYRIGHT BILL.

The following is the text of the new Copyright (Artistic) Bill, introduced to the House of Lords by Lord Monkswell.

PART I.

1. This Act may be cited for all purposes as the Artistic Copyright Act, 1900.
2. This Act shall come into operation on the first day of January, nineteen hundred and one.
3. The author of any artistic work to which this Act applies, wherever he is or is not a subject of Her Majesty, shall be entitled throughout Her Majesty's dominions to the copyright of such work for a period beginning with the making thereof, and lasting for the life of the author, and thirty years after the end of the year in which he dies, and longer.
4. The copyright in an artistic work and right of ownership shall be personal property: they may be vested in the same or different persons, and shall be deemed to be distinct properties for the purposes of assignment, devolution at law, and otherwise.
5. The owner for the time being of the copyright in any artistic work who is not the owner of the work itself shall not, nor shall his representatives or assignees, exercise any privileges conferred by such right without the consent of the owner for the time being of the work itself, or of representatives or assignees of such last-mentioned owner.
6. The owner of the copyright in artistic work or of the right of possession of such work may assign his right wholly or partially, or may grant any interest therein, but such assignment or a grant shall not be valid unless it is in writing, signed by the owner of the right in respect of which it is granted.

INFRINGEMENT OF COPYRIGHT.

7. If any person infringes any right conferred by this Act in respect of copyright in an artistic work, the owner of such right may maintain an action for damages, and for an injunction, or either of such remedies.

SUMMARY REMEDIES.

8. If any person commits any of the following offences—

- (1.) Sell or lets for hire, or exposes, offers, or keeps for sale or hire any pirated artistic work;
- (2.) Distributes or exhibits in public any pirated artistic work;
- (3.) Imports into any part of Her Majesty's dominions, or from or between any part of Her Majesty's dominions, any pirated artistic work;

he shall, unless he proves to the satisfaction of the court that he did not know and could not with reasonable care have ascertained that the work was pirated, be liable to a penalty not exceeding five pounds for every article of work dealt with in contravention of this section, and also to forfeit the copies of the work so pirated to the owner of the copyright, provided that the whole penalties inflicted on any one offender in respect of the same transaction shall not exceed fifty pounds.

9. A court of summary jurisdiction upon the application of the owner of the copyright in any artistic work, or of the owner for the time being of such work, may act as follows:—

(1.) If satisfied by evidence that there is reasonable ground for believing that pirated copies of such work are being hawked, carried about, sold, or offered for sale, may by order authorise a constable to seize such copies without warrant and to bring them before the court, and the court, on proof that the copies are pirated, may order them to be destroyed or to be delivered up to the owner of the copyright, or of the work as aforesaid, if he makes application for that delivery.

(2.) If satisfied that there is reasonable ground for believing that pirated copies of any artistic work are to be found in any house, shop, or other place within its jurisdiction, may by order authorise any

constable to search for such copies in such shop, house, or place between sunrise and sunset, and to seize and bring before the court any copies reasonably suspected of being such copies as aforesaid, and the court, on proof that such copies are pirated, may order the same to be destroyed or to be delivered up to the owner of the copyright or of the work as aforesaid, if he makes application for their delivery.

10. If any person hawks, carries about, sells, or offers for sale any pirated copy of any artistic work the subject of copyright under this Act, every such pirated copy may be seized by any constable, without warrant, on the request in writing of the apparent owner of the copyright in such work, or of the owner of such work, or of his agent thereto authorised in writing, and at the risk of such owner.

On seizure of any such copies, they shall be conveyed by such constable before a court of summary jurisdiction, and on proof that they are pirated copies shall be forfeited or destroyed, or otherwise dealt with as the court may think fit.

11. All penalties under this Act shall be recovered summarily, but no proceedings shall be instituted for the recovery of a penalty after the expiration of six months from the date of the offence in respect of which the penalty is imposed.

12. Where any penalty is directed to be recovered summarily, or act or thing authorised to be done by or in a court of summary jurisdiction, such act or thing may be done—

(a.) In England, Wales, or Ireland, by or in a court of summary jurisdiction as defined by the Interpretation Act, 1889;

(b.) In Scotland by or in any court having jurisdiction under the Summary Jurisdiction (Scotland) Acts;

(c.) In the Channel Islands, the Isle of Man, or any British possession, by or in the court, or by justices or magistrates who exercise jurisdiction in the like cases to those in which the Summary Jurisdiction Acts are applicable.

13. Where proceedings for any penalty under this Act are instituted by the owner of the copyright, or of the owner for the time being of such work, the penalty shall be paid to such owner by way of compensation for the injury he has sustained, and any pirated copies shall be forfeited and delivered up to the owner on his application. In any other case the penalty shall be applied in the manner provided by the Acts under which the penalty is inflicted, and pirated copies shall be destroyed.

14. The owner of any artistic work, although he is not the owner of the copyright, may in the case of the infringement of the copyright in such work, or of any offence being committed under this Act in respect of any artistic work, institute the same proceedings in respect of such infringement or offence as if he were the owner of the copyright.

PART II.—APPLICATION OF ACT, DEFINITIONS, AND EXCEPTIONAL PROVISIONS.

15. This Act shall not apply to the artistic works following:—

- (1.) Books as defined by the Literary Copyright Act, 1900, or
- (2.) Designs as defined by the Patents, Designs, and Trade Marks Act, 1883, or

(3.) Engravings, prints or photographs, copies of artistic works in which copyright is subsisting, and which copies are not authorised to be made by the owners of the copyright in the works of which they are copies.

Save as aforesaid for the purposes of this Act the expression "artistic work" means:—

- (1.) Any work of painting, drawing, or sculpture, and
- (2.) Any engraving, etching, print, lithograph, woodcut, photograph, or other work of art, produced by any process, mechanical or otherwise, by which impressions or representations of such works can be taken or multiplied, and

(3.) Any plastic work relative to geography, topography, architecture, or science in general, and

(4.) Any production in the literary, scientific, or artistic domain which can be published by any mode of impression or reproduction.

16. The expression "engravings and prints" as used in this Act includes "etchings, lithographs, woodcuts, and other artistic work not being photographs produced by any process, mechanical or otherwise, by which impressions or representations of artistic works can be taken or multiplied."

"Author" means the painter, sculptor, engraver, or maker of an artistic work, and includes the personal representatives of the author.

"Owner" means the person for the time being entitled to the possession of an artistic work, and includes the personal representatives of the owner.

"Pirated artistic work" means any work produced without the authority duly given of the owner of the copyright in such work.

"Copyright" in respect of an artistic work means the exclusive right to reproduce such work, or any material part thereof, in any form, in any material, or for any purpose, or to authorise another person to reproduce such work or any material part thereof.

"Action" includes any proceeding in a superior court analogous to an action in England.

SPECIAL PROVISIONS.

17. The following regulations shall be made with respect to engravings and prints:—

(1.) The engraver or other person who makes the plate or other instrument by which copies of an artistic work are multiplied shall be deemed to be the author of the engraving or print, and entitled to copyright in the copies produced by such plate or instrument until and unless such copyright has been assigned as provided by this Act, or vested by devolution in law or death in some other person, and the owner of the copyright in such engraving or print may, subject to any arrangement he has made to the contrary, exercise all the privileges attached to his copyright without the consent of any other person.

(2.) The delivery of the instrument by which an engraving or print is produced shall not, in the absence of a written assignment, as provided by this Act, operate as an assignment of copyright.

18. The following regulations shall be made with respect to photographs:—

(1.) The owner for the time being of the negative shall be deemed to be the author, and an assignment of the copyright may be made either by delivery of the negative or by the assignment of the copyright in writing.

(2.) Where a photograph is made of any person for valuable consideration, the owner of the copyright shall not, during the life of the person photographed, be entitled to sell or exhibit, without his consent, copies of his photograph, but, save as aforesaid, the owner of the copyright in a photograph may deal with his right of copyright without the consent of the owner of the photograph, or of any copy thereof.

19. When the author of an engraving, print, or photograph, is a member of the firm or body of persons, the author, for the purposes of this Act, shall be such member of the firm or body as they may select.

20. Nothing in this Act shall prejudice the right of any person to copy or use any artistic work in which there is no copyright, or to represent any scene or object, notwithstanding there may be copyright in some representation of such scene or object.

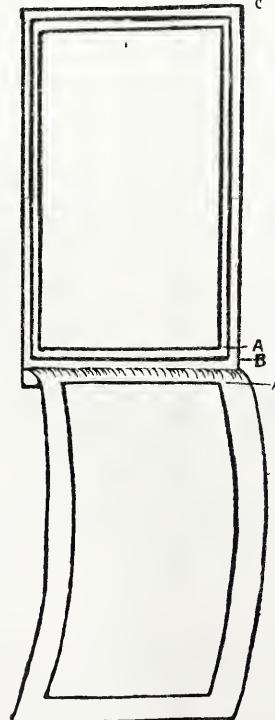
21. Copyright under this Act shall not subsist in any profane, libellous, or indecent artistic work.

22. Part II. of the Literary Copyright Act, 1900, relating to international law, shall apply to any artistic work to which this Act applies in the same manner in all respects as if such part were re-enacted in this Act and artistic work were included in the definition of book.

23. This Act shall apply to any artistic work made before or after the commencement of this Act.

A PHOTOGRAPHIC MOUNT.

MR. T. H. RADFORD suggests the use of a mount which consists of two cardboards the same size, fastened together on one end, the bottom board



having two or more lines printed on, also being gummed from the inside line, A, to the outside edge, C, on drawing. The top cardboard is cut out in the middle, the same size as the inside line, A, on the bottom board.

The photographs, or pictures, are to be cut to the same size as line B on drawing.

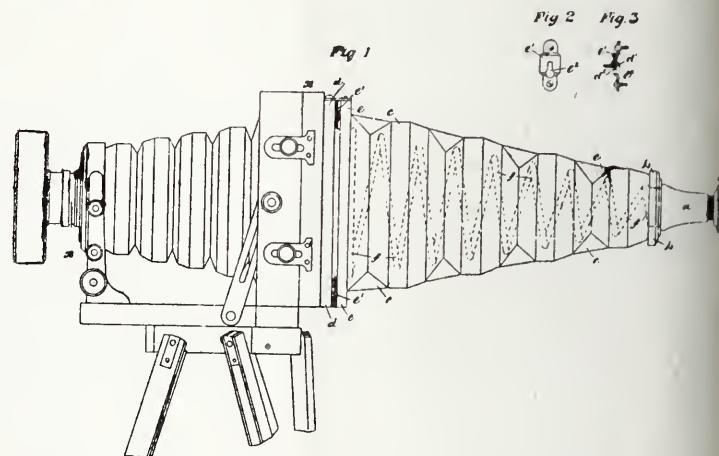
Mr. Radford recommends in mounting, to draw a wet brush over the gummed parts on the bottom board, then place the photographs, or pictures, according to line B on drawing. Press the front board down over the top; the mounting is then complete.

ERECTING THE IMAGE IN FOCUSING.

MR. F. W. SAXBY proposes to do this in the following manner—the description is taken from his patent specification:—

The picture, as represented on the ground glass or focal plane of a camera in reverse, is "erected" so as to be seen as it exists by the employment of a short-focus reversing glass, which in one form is in binocular arrangement, and in another form as a monocular glass. Further, there is used in connexion with a camera—that is, the back of a camera—an extensible and collapsible covering which excludes the light, and, at the outer end of this covering, the said short-focus glass or glasses is or are applied. When these articles or attachments are applied to the back of the camera, and the photographer looks through the glasses, the image appearing on the glass or focal plane will be seen as ordinarily seen by the eye, and not in reverse. Preferably, the reversing glass will be a magnifying glass as well, so that the image can be most carefully examined and scrutinised during the act of focussing, and the best composition and effect accurately obtained.

In one form or arrangement, the glass or glasses, as the case may be, is or are supported in an end plate or board, say, detachably; and between this plate or board and the back of the camera a covering or flexible material, such as a bellows formation or cloth, will be provided, so as to enclose the space between the telescope glass and the back of the camera, and keep out extraneous light. The distance between the



glasses and the back of the camera may be assured, or rendered constant, by folding or extensible arms, levers, or spiral wire spring, or the like, which also support the backboard or plate and telescope.

The short-focus reversing glass is marked *a*, and, by its reversing nature, the object thrown on to the screen, or focal plane, of the camera, in viewing the object prior to taking the photograph, is seen the right way up, and not in reverse, as it appears without the glass. And this glass, *a*, is detachably fixed in the plate, *b* (say, by screw threads on its end), which is fitted on to the outer end of the closed collapsible case, *c*, the front end of the case being fixed on to the frame, *d*, of the ordinary ground-glass screen of the camera, which is of the ordinary kind, and generally designated *x*. The glass, *a*, is kept firm, standing out from the back of the camera in the position shown in the drawing, by means of the spiral spring, *f*, inside *c*, fixed to the frame, *e*, and board, *b*, when expanded, or it may be held out by any equivalent means.

This spring, *f*, supports the glass sufficiently firmly out in the position shown, and at the same time allows of slight lateral movement, being elastic, when the eyepiece, *a'*, of the glass, *a*, is touched by the user's face in being looked through, so that the camera itself is not shaken or disturbed.

The spring, *f*, of course, allows of the case, *c*, being collapsible for close storage by pressing the parts, *b* and *e*, towards one another, and locking them together in any suitable known way.

It is well known that, if the subject to be photographed were thrown on to the screen, *d*, as seen by the eye naturally, instead of upside down, as is now always done, the subject could be better arranged, and better or more artistic and satisfactory pictures could be produced; and it is well known that this has been a long-felt want of photographers. It is, however, also well known that this end could be easily effected by using lenses in the camera which would make the subject appear the right side up; but there are against this certain well-known technical and scientific

objections, which render the use of this method of accomplishing the object impossible—that is, more objectionable than the reversed image as now exists. Consequently this method is never employed. By the invention the object is attained by the employment of the case, *c*, closely fitting—*i.e.*, light-tight—to the ground-glass screen, *d*, and having at its outer end the short-focus reversing glass, *a*, by which the image of the subject thrown on to the screen in reverse by the lenses of the camera, is again reversed or “erected” by the reversing glass, and is seen as normally seen by the eye, and, furthermore, the case, *c*, being made of collapsible bag form, such as the kind of collapsible material used on the front of cameras, and, like photographic apparatus, it can be collapsed, and occupies little space when off the camera.

To connect this apparatus with, and disconnect it from, the camera, the front wood frame, *e*, is provided with fastening plates, *e*¹ (see figs. 2 and 3), having slots, *c*², in them which fit over the heads of screws, *d*¹, having plain shoulders, *d*², on them, and which screw into the back of the screen frame, *d*, one of said fastenings being used at each corner. By this attachment the whole apparatus, consisting of frames, *e*, collapsing chamber, *c*, back frame, *d*, and reversing glass, *a*, can be lifted on and off, collapsed, and stowed away, or applied and extended, very quickly, and will take little space when closed.

FLASHLIGHT PHOTOGRAPHY.

On Monday, March 19, a lecture was given, under the auspices of the Derby Photographic Society, by Mr. Councillor W. W. Winter, the well-known photographer, of Midland-road, Derby. The chair was taken by Mr. C. B. Keene, and there was an unusually large attendance, including a number of ladies. The Chairman briefly introduced Mr. Winter, who at once proceeded with his lecture, the subject being, “Flashlight Photography.” He said that, in the days of wet-plate photography, the absence of the sun during certain days of winter rendered it almost impossible to pursue photography with good results. Professional photographers owed a great deal to amateurs for many inventions that had facilitated their business very materially, particularly the introduction of the dry plate. Naturally the modern photographer was unable to appreciate, in comparison with the pioneers of photography, all the improvements in what might truly be termed the most popular of all arts and sciences of the present day. The lecturer then went on to describe the early methods of taking photographs by artificial light, and said the second method which was introduced was one which was more under control, but not sufficiently reliable to become popular—he referred to the magnesium ribbon worked through a lamp. Its weak point was a want of continuity. Passing on, he referred to the invention of Mr. Slingsby, of Lincoln, who was an enthusiast in the direction of artificial lighting. There were a number of lamps in the market at the time, but there was no way of managing them, and Mr. Slingsby invented the apparatus which they saw before them. After a while ordinary gas was used, and an expensive arrangement was floated upon the market in the shape of a huge gas-burner, consisting of a large cluster of gas-jets, perhaps 100. This was set up in the midst of a reflector with a looking-glass back, and in front was a blue glass, very necessary, especially for the sitter, in consequence of the heat given off. This and other methods had been superseded by the introduction of the electric light. Flashlight photography was very useful, but it took too long to fill the lamps and make it a commercial success. Speaking of the work done by the members of the Derby Photographic Society, Mr. Winter said he must confess that he had been greatly charmed by much of it done by both ladies and gentlemen. Having spoken of the various ways in which flashlight photography might be found useful, he went on to warn his audience of the various dangers which were ever present in manipulating the lamps, and pointed out in what manner they were to be avoided and the best results obtained. During his lecture Mr. Winter related some amusing incidents which had occurred in connexion with local photography, and dealt with the technical part of his subject in a very lucid and highly interesting manner. He demonstrated his remarks by experiments, &c., and at the end of his lecture answered a number of questions put by members of the Society.

Mr. W. R. Bland moved a very cordial vote of thanks to Mr. Winter for his great kindness in delivering such an able and valuable lecture. He had been particularly struck with the very genial manner in which Mr. Winter had dealt with his subject, and by the very winning and cordial manner in which he had, so to speak, come down to the amateurs' level. He had told them everything about the difficulties which arose in the flashlight system, and had also gracefully acknowledged the benefits which amateur experiments in photography had conferred upon the profession generally. Mr. Winter had gained a name which was known all the world over, and he had gained it by doing things thoroughly. Amateur photographers, if they desired to succeed, must follow his example, and never be satisfied with anything but the very best productions. He also desired to couple with the motion a vote of thanks to Mr. Winter's assistants, who had also been at great trouble in carrying out the necessary arrangements.

The motion was seconded by Mr. Dawson and carried with applause, and Mr. Councillor Winter suitably responded.

At the close of the proceedings those present were formed into a group and a very successful flashlight photograph was taken.

THE TWENTIETH CENTURY INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

In connexion with the Twentieth Century Engineering and General Trades Exhibition at Bingley Hall, Birmingham, Mr. Walter D. Welford has organized a very large and comprehensive display of photographs. For the various medals, &c., offered, over 150 amateurs and professionals competed, and about 600 pictures are hung. The exhibition was opened on Monday last by The Right Hon. The Lord Mayor of Birmingham, the judging of the photographs, however, was completed on Friday last, thus giving Mr. Welford the opportunity of getting the award lists into the hands of the competitors before the exhibition opened, which is at all times a commendable feature.

The photographs occupy the whole of a very long and spacious gallery, and are entirely by themselves. The gallery is nicely decorated and made comfortable with seats, &c., and will doubtless prove a great attraction. Last year there were too many pictures (over 900), but possibly the selective power of the manager has helped in the present great improvement. For, although the walls are still well filled, a better arrangement has been possible altogether, and, moreover, the elimination of some of the very poor pictures gives a higher tone to the rest. The work shown is certainly of a high standard, and in some of the classes the Judges must have had considerable trouble in coming to a decision. In addition to British work there are examples from America, France, Switzerland, and Turkey. The fair sex is strongly and numerously represented, and there are pictures by ladies that, doubtless, ran the male workers rather closely.

Mr. Welford is somewhat disappointed at the result of his efforts on behalf of professionals and employees, the special classes arranged for them certainly not meeting with the support they deserved, although the competition for negative working-up met with fair recognition, chiefly by lady retouchers, however. The class for trade work, photographs taken for business and advertising purposes is, however, quite a failure. Mr. Welford rather humorously states that if this class had been open to amateurs as well it would have been a success, which is rather hard on—well, we cannot say which.

As last year, the division for amateurs who have not previously gained an award at an open exhibition is particularly strong, the Judges themselves remarking upon this point, and this not only in number but in quality.

The Judges were Messrs. Harold Baker, R. Child Bayley, and A. Horsley Hinton, and their awards are embodied in the following notes:—

THE CHAMPION CLASS.—Honours again fell to Scotland, Edinburgh winning both the gold and silver-gilt medals. There is no Champion Class of the usual stamp, but the Judges select the best four pictures exhibited, quite irrespective of class, and these four are afterwards debarred from taking other awards except the special prizes. The winner of the premier award, Mr. Jas. Burns, of Edinburgh, is comparatively a new exhibitor, and is to be congratulated upon his success. His picture, representing a girl on the sea shore, entitled *The Wind Bloweth from the Sea*, which gains the gold medal, is a clever piece of work, but one is somewhat in doubt whether, after all, it is not a lucky snap-shot, rather than an earnest attempt at a well-thought-out subject. Still, it is good, and deserves the award. The silver-gilt medal was awarded to Mr. Alex. Allan, of Edinburgh, for figure and doorway study in strong sunlight. It is somewhat suggestive of Demachy and Craig Annan, but is, nevertheless, a very delicate rendering of a difficult subject. The silver medal was gained by Mr. Francis A. Bolton, of Oakamoor, for *Looking Westward*, one of those peaceful, low-toned subjects, with a powerful sky. Mr. George Whitehouse, Birmingham, gained the diploma for *A Gleam of Sunshine*, a picture of the birch and bracken school, but without either birch or bracken, the strong feature of which is the soft lighting.

LANDSCAPE.—A very good representative class, with work by Messrs. Rawkins, Dubreuil, Hallier, Cowen, Bolton, Terras, Greatbach, Boetto, Revilliod, Fraser, Page Croft, &c. Silver-gilt medal to Mr. J. Page Croft, Birmingham, for *Within the Dale*; silver medal to Mr. Hugh Lewis, Birmingham, for *Through Mists and Snows*; bronze medal to Mr. Ralph R. Rawkins, for *The Sentinels*; and diploma to Mr. Harold Burkinshaw, Belper, for *A Derbyshire Lane*. The class comprises some 90 frames from 40 exhibitors.

SEASCAPE.—A somewhat small class as usual, with 35 pictures from 25 exhibitors. Silver-gilt medal, Mr. Graystone Bird, Bath, for *Joe's Ship*; bronze medal, Mr. Francis A. Bolton, Oakamoor, for *Low Tide*; and diploma, Mr. W. H. Rogers, Croydon, for *A Bit of Holland*, the gold medal picture of the recent South London Society's Exhibition.

PORTRAITURE AND FIGURES.—A very large class of nearly 200 pictures, and one containing some excellent work by no less than 50 exhibitors. Silver-gilt medal, Mr. Jas. Auld, Edinburgh, *Portrait of a Girl*; bronze

medal, Mr. C. Skelton Tyler, Earls Colne, *Morning News*; and diploma, Mr. Heath J. Haviland, London, *Constance*. Amongst other good pictures we may mention those by Eleanor R. Grey, Miss Weil, Mr. Jas. F. Armitage, Jeanie A. Welford, Mr. H. W. R. Child, Mrs. Girdlestone, Mrs. Shawcross, Mr. J. Page Croft, and Mr. Jas. Burns.

ARCHITECTURE.—Rather a small collection, but containing excellent work. Silver-gilt medal, Mr. Sydney Alf. Pilcher, Gloucester, *Crypt, Gloucester*; bronze medal, Mr. W. T. Greatbach, Birmingham, *The Miller's Workshop*; and diploma, Mr. Ralph R. Rawkins, London, *A Canal Lock*. There is but little to choose between these pictures.

SPECIAL for amateurs who have not previously gained an award at an open exhibition. This is the biggest class in the Exhibition, and in spite of its being practically for novices, there is but little mediocrity. Silver-gilt medal, Mr. Alex Allan, jun., Glasgow, *Sunshine and Shadow*; bronze medal, Mr. J. Greenway, Birmingham, *Hawthorns*; and diploma, Mr. Sparham Camp, Sheffield, *St. Luke's Chapel, Norwich Cathedral*. Excellent work is also shown by Messrs. C. F. Gare, A. H. Robinson, Fred E. Slater, Aubrey C. Peach, Edgar W. Taylor, Max Mossel, Albert Haynes, H. A. Norman, and others.

HAND-CAMERA WORK.—Silver-gilt medal, Mr. J. Kearney, jun., Liverpool; bronze medal, Mr. H. W. R. Child, London; diploma, Mr. J. Greenway, Birmingham.

INSTANTANEOUS.—Silver-gilt medal, Mr. Ralph R. Rawkins, London; bronze medal, Mr. Fred Spalding, Chelmsford; and diploma, Mr. Walter Kilbey, Richmond.

FLOWERS AND FRUIT.—Mr. John M. Whitehead, of Alva, again wins his place, and secures the silver-gilt medal; Mr. William Howell, of London, taking the bronze; and Mrs. Caleb Keene, the diploma.

COMBINATION PRINTING.—Silver medal, Mr. Albert O. Forrest, Pontypridd; bronze medal, Mr. Francis Fielding, Blackburn; diploma withheld.

NEGATIVE WORKING UP.—In this class a damaged negative had to be retouched, and a print in each state shown. Miss E. A. Briggs, Manchester, gained the silver-gilt medal and diploma; and Miss Dora W. Phillput, Bath, the bronze medal and diploma. The competition in this class was decidedly keen.

TRADE WORK for business and advertising purposes.—Silver-gilt medal with diploma, Mr. Jas. W. Tattersall, Accrington; bronze medal and diploma withheld.

ANIMALS.—Silver medal, Mr. Chas. E. Walmsley, Ambleside, *Study of Cattle*; bronze medal, Mr. Geo. B. Cowen, Ramsey, *Strayed*.

SPECIAL PRIZES.—The *Amateur Photographer* medal for best work by a lady, Miss G. F. M. Hopkins, Oxford; *Photography* silver medal, Mr. Jas. Burns, Edinburgh; hand camera for largest exhibit, Mr. J. Page Croft, Birmingham; "Tella" prize, value 2*l. 2s.*, Mr. H. Dunning, Usk; and Manager's prize, value 1*l. 1s.*, for best bromide print, Mr. Jas. Burns, Edinburgh.

The Gallery is well lit in the daytime, and also at night by electric light, and the photographic section will certainly prove an attraction to the general show.

Our Editorial Table.

MESSRS. JOHN J. GRIFFIN & SONS, LIMITED, of 20-26, Sardinia-street, Lincoln's Inn-fields, W.C., have sent us a specimen copy of a new show-card for advertising "Velox," which they forward gratis to all dealers who stock the paper. The card is strikingly effective in design. Upon a black ground a singularly delicate print on the favourite paper is mounted, and the word "Velox" is stamped in bold silver gilt letters. As a show-card it perfectly "fills the bill."

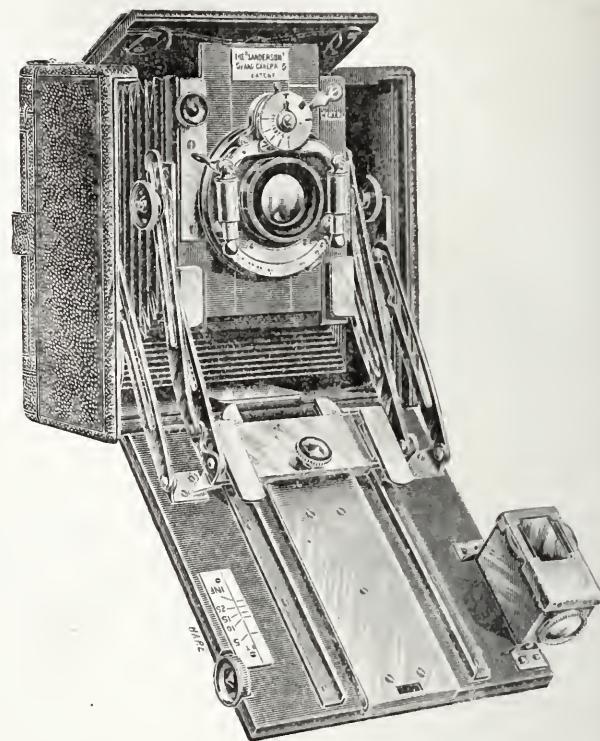
MESSRS. A. E. STALEY & CO., of 35, Aldermanbury, E.C., have sent us a copy of their new catalogue, a neatly printed and produced little book which gives particulars of the Ray and Korona cameras, Bausch and Lomb shutters, ray filters and microscopes, and other photographic apparatus for which Messrs. Staley are agents. The specimen half-tone illustrations in the book are capital, and the catalogue is one which dealers and others should possess.

THE Liverpool Artistic and Enlarging Company, of 21, Kensington, Liverpool, have submitted to us several specimens of the enlargements with which they supply photographers at low charges. Taking the latter point into consideration, the quality of the work deserves to be commended.

THE SANDERSON HAND CAMERA.

Manufactured and sold by George Houghton & Son, 88 and 89, High Holborn, W.C. In our notice last week of the new Sanderson hand camera space could not be found for a lengthy reference to a most valuable new movement which it possesses. The illustration shows the baseboard dropped out of the way when used with a wide-angle lens. This movement allows of wide-angle lenses of three inches, or even shorter focus, being used. It

does not complicate the camera in any way, and simply entails making the side struts supporting the folding baseboard a little longer than usual. When opening the camera for use, the baseboard falls naturally into the normal position, i.e., at right angles to the back, and, should the wide angle movement be necessary, all that is required is to press in the



side struts and allow the baseboard to fall into the position shown in the illustration. Before doing this, however, the lens and front should be drawn forward on to the folding baseboard, and, after dropping the front, the lens can then be brought into the correct position by means of the universal swing front.

BIBLIOTHÈQUE PHOTOGRAPHIQUE.

Reproduction des Gravures, Dessins, Plans, Manuscrits. Par A. COURRÈGES. Manuel Pratique de Photographie au Charbon. Par EDOUARD BELIN. Gauthier-Villars, Paris.

M. GAUTHIER-VILLARS has added these two small volumes to the series of the Bibliothèque Photographique. The first is dedicated by M. Courrèges to his son, and gives, in a simple form, the necessary conditions to be observed in the copying of engravings, drawings, plans, manuscripts, &c. The second volume is a guide to carbon printing, by M. Ed. Belin. It gives the reader a succinct account of the process, from the preparation of the tissue to the production of the finished print, whether upon paper or other types of final support. A special chapter is devoted to the recent modifications of carbon photography, known as the Artigue and gum-bichromate processes.

THE "Gem" Dry Plate Co., of Willesden Green, N.W., send us a copy of their sheet almanac for 1900. Besides a calendar, there are formulæ for development, intensifying, reducing, &c. The almanac should be found useful for reference in dry-plate work.

THE "Special Rapid" is the distinctive name of a new plate of this season's manufacture which the Warwick Dry Plate Company, of Warwick, are just introducing to the photographic public. The plate is intended for studio use, and the characteristic qualities of the image it yields appear to well adapt it for that purpose. Our trial negatives, developed with a metol solution, gave soft, fine-grained deposits, with ample density, and we should judge that excellent portrait results would be obtained on the Warwick Special Rapid plates.

MESSRS. G. W. Wilson, Limited, of 2, St. Swithin's Street, Aberdeen, send us their illustrated catalogue of lantern slides of South Africa. The quality of a Wilson lantern slide has passed into proverb: there is nothing better of the kind extant. The present list contains over twenty half-tone reproductions of views taken in South Africa, and indicates that the entire series, which is exceedingly large and comprehensive, is of very great interest. It is to be noted that the series was only completed in 1899, so that it has been brought right up to date. We advise all interested in the illustration of South Africa, by means of optical projection, to send for this list of Messrs. Wilson's lantern slides.

Studio Gossip.

THE Paris Exposition will not be ready for public inauguration on Easter Sunday, April 15. Many of the buildings will be incomplete, and the Exhibition will be only during the daytime for some time after the official opening. It is thought by May 1 that the Exhibition will be in a fairly satisfactory state.

THE BRITTLEBANK MEETINGS.—Mr. Frederick York kindly sends us the following interesting note: "In passing Tottenham Court-road, I noticed that Brittlebank's old premises were being pulled down. I was reminded that twenty years since in his studio a few of the old South London members used to meet and discuss the transition from collodion to gelatine. These informal meetings grew in numbers, and from which emanated the Photographic Club, which located itself at Ashley's Hotel. Many of the earliest of this coterie have passed away (Taylor, S. Fry, Harrison, Kidd, &c.), and others are scattered over the world (Maudsley, Brittlebank, &c.). It is unfortunate that there is no photograph of the old place in existence for Sir Benjamin Stone to have placed it with other memorable buildings in the British Museum."

PHOTOGRAPHING SUSPECTS.—At the Glamorgan Assizes on Thursday, during the hearing of a series of cases of hotel robberies at Swansea, it transpired that the chief inspector of the Swansea police force had circulated specially taken photographs of a man arrested in London who was awaiting his trial by the magistrates. In answer to Mr. Justice Bucknill, Mr. Morris, the chief detective, said he knew several instances where a suspect was so photographed; and his Lordship said such a course was absolutely illegal. "Suppose the subject objected, would you use force?" asked his Lordship. "Most certainly," promptly replied the detective, "if my superior officer ordered it." "What's your authority?" continued the Judge. "My only authority is my superior officer," was the reply. His Lordship again pointed to the illegality of such a proceeding as to force a man merely under arrest on suspicion before the official camera.

SPEAKING at Derby on March 12, at the distribution of prizes to students of the Municipal Technical College, Sir William Abney, K.C.B., referred to the fact that, at the end of this month, the Department of Science and Art will come to an end. It will be merged in a department to be known as the Board of Education, which is to supervise all kinds of education—elementary, secondary, and technological. He remarked: In the Queen's Speech they were promised that there should be an Education Bill introduced, reorganizing the authorities for secondary education. The introduction of such a Bill marked a great advance in public opinion as to the necessity of local co-operation of the kind in question. Speaking in his private capacity, and not officially, he hoped that not only would secondary education be under a local authority, which would supervise it and look after its interests, but that all other education would be similarly managed.

THE Pittsburg Amateur Photographers' Society announce that the third annual International Salon and Exhibition will be held in the Carnegie Art Galleries, Pittsburg, U.S.A., from May 17 to 31, 1900. The prospectus states that the Society's purpose in holding its Annual International Salon and Exhibition is manifold, the chief desire being to encourage and recognise the earnest and truly artistic photographic workers to establish a free, permanent, and extensive exhibition of the very best photographic art works of the world, at the Carnegie Art Galleries, of Pittsburg. As heretofore, there will be two separate and distinct divisions or exhibitions, the Salon and General Exhibition. Both divisions will be open to all artistic workers throughout the world. The Salon division will include only such pictures as the Judges may select from the entire collection of pictures entered in either division possessing artistic merit, displaying artistic aim in selection of subject, or other features revealing true works of art. Technical work in the production of these pictures will not receive much consideration. The General Exhibition division will be a separate and distinct Exhibition, and will include photographs of merit, though not of sufficient artistic excellence to entitle them to be hung in the Salon. Special attention will be given to technique and good judgment in the selection and arrangement of subject. It will include all of the better classes of average exhibition work. Pictures from abroad, if delivered not later than April 14, carriage prepaid to the following address, will be transported to Pittsburg and returned to London, free of all expense to the exhibitor. Announcements, entry blanks, &c., may be obtained by addressing General Agent of the American Express Company at London, Paris, or Bremen. Duplicate invoice must accompany each parcel of photographs. If photographs are forwarded by mail, address same to Mr. Joseph H. Hunter, Secretary, Pittsburg Amateur Photographers' Society, Pittsburg, Penn'a., U.S.A. Forwarding directions: General Agent American Express Company, 3, Waterloo-place, London, England. To be forwarded to Pittsburg Amateur Photographers' Society (in bond).

News and Notes.

PHOTOGRAPHIC CLUB.—April 4, 1900, at eight o'clock, paper by Mr. W. Thomas.

ERRATA.—In our report, last week, of the Stratford Exhibition, there were two typographical errors. In line 7 the sentence "all tell of lives of evil, and even for a fierce struggle for existence," should read, "all tell of lives of *toil*, and even of a fierce struggle for existence."

ROYAL PHOTOGRAPHIC SOCIETY.—Lantern Meeting, Tuesday, April 3, at eight p.m., at 66, Russell-square. Mr. F. P. Cembrano will show "Slides Old and New." The Exhibition by the National Photographic Record Association can be viewed on presentation of visiting card.

THE COPYRIGHT BUSINESS OF THE UNITED STATES.—The last report of the Librarian of Congress gives in tabular form the copyright business for the fiscal year of 1898-99. The number of copyright deposits from July 1, 1898, to June 30, 1899, amounted to 59,217, and, as two copies of each were received, it reached 118,434; of this number 59,217, only 5834 were of books proper. There were 4196 articles entered under the term "book" under the copyright law, including circulars, leaflets, charts, &c. There were 5185 newspapers and magazine contributions, 517 dramatic compositions and 9777 numbers of periodicals, 19,973 musical compositions, 1478 maps, 2505 engravings and prints, 1050 chromos and lithographs, and 7695 photographs.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—The Annual Dinner of this Society was held at the Holborn Restaurant on Saturday evening last, the 24th inst., the President in the chair. In the course of the evening a silver coffee service was handed to Mr. Mummery (who recently resigned the presidency, which he had held for nearly five years) as a slight token of the appreciation which all the members felt for the services he had rendered to the Society during his time of office. Mr. Mummery, who was received with cheers and the very hearty singing of "He's a jolly good fellow," said that all he had done for the Society he had done with the utmost pleasure, and he looked back upon the time during which he had occupied the chair as a period marked by the most pleasant memories. He had always received the heartiest support from officers and members.

FROM the report of arrangements in connexion with the forthcoming Glasgow International Exhibition, we find that the use of hand cameras will be permitted in the grounds to ordinary visitors, but the right to use stand cameras and sell photographs has been sold to Messrs. T. & R. Annan. The fact that the right to use hand cameras has been reserved to the public is something to be thankful for, and the members of the Glasgow associations who have worked to this end must congratulate themselves on this victory against the ever-increasing tendency to restrictions in such exhibitions. Probably the like concession granted in connexion with the Paris Exhibition was not without its weight with the managers. Neither is it likely that the Exhibition will suffer from this concession, but rather the reverse, as each print made from negatives taken will be a kind of free advertisement of all the beauties and "fairlies" to be seen after passing the turnstiles.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—At a meeting of the Executive Committee, held at 66, Russell-square, on Wednesday, March 14, 1900, Mr. H. Snowden Ward in the chair, the Secretary reported the inability of Mr. W. Thomas to accept a seat on the Committee. His place was filled by the appointment of Mr. H. Vivian Hyde, both on the Executive Committee and the Slide Division Committee. Arrangements for new lectures and slides were considered, details of which will be announced in due course. Proofs of the *Affiliation Annual* were submitted and approved. It was agreed to procure a small set of slides illustrative of Tinworth's work, to be accompanied by a short paper upon his life. A proposal from the Hackney Society in favour of an attempt being made to secure cheap fares on railways for photographers was discussed. It was decided to inform the Hackney Society that any resolution they might formulate upon the subject would be put forward. It was resolved to call a conference of Judges at an early date, and to invite any person who had acted as a Judge at any exhibition having an open class. Certain modifications in the rules at present in force were made, which will be submitted to the Conference.

Commercial Intelligence.

MR. J. M. THOMSON, F.S.M.C., B.O.A., has entered the service of Messrs. J. Barker & Co., of Kensington, to have charge of the optical and photographic department.

KODAK, LIMITED.—The Directors have declared an interim dividend on the Company's preference issue for the quarter ending March 31, 1900, at the rate of six per cent. per annum, and on the ordinary shares at the rate of ten per cent. per annum for the same period, which dividends will be payable on or after the 1st proximo.

THE International Advertisers' Exhibition, to be held this year at the Crystal Palace from April 28 to May 26, will cover every department of advertising. It is to be divided into nine classes, including posters and show-cards, decorative panels, lithographed book and music covers, pictorial programmes and admission cards, decorated tinware, colour printing processes and machinery in motion, and original designs for posters.

MESSRS. G. MENGE & CO., of 23, Moorfields, E.C., write: Re your issue of Friday, March 16, 1900. Among the addresses wanted, E. Goodfellow wishes to know where he can get small photograph frames with tiny brass rims inside, as supplied by Marion and others. We supply all descriptions of brass rims, &c., for photographing purposes, but only in a wholesale way. If E. Goodfellow is a wholesale buyer, perhaps you will put him in communication with us.

MESSRS. A. E. STALEY & CO., of 35, Aldermanbury, announce a list of new reduced prices for Ray and Korona cameras, in conjunction with the Camera Combined, as follows: Koronas, 5x4, in case, with three slides, lens, time and instantaneous iris shutter, each 45s.; with rapid rectilinear, each 57s. 6d. Ray cameras, 5x4, covered in morocco, on mahogany, in case, with three slides, time and instantaneous shutter, each 45s.; with rapid rectilinear lens, each 60s.

WE are informed that the business of Messrs. Thorn & Hodde, of Westminster and Camberwell, is being converted into a limited company, having, in the course of four years, developed from the manufacture and sale of small acetylene generators for magic-lantern purposes to the supply of installations

for public and private lighting of whole villages with acetylene. The growth of the undertaking has rendered necessary the proposed change in the business, and the lighting of country houses, churches, and villages presents a field for the use of capital which is both interesting and promising.

THE Gem Dry Plate Company, Limited, of 92, Villiers-road, Willesden Green, N.W., announce a free offer for Easter, 1900, of a box of Gem plates. The following are the conditions: 1. The sizes offered are quarter-plates one dozen, and half-plates half a dozen. The speed required must be named, also if the plates are for hand cameras. 2. Applicants must be *bond-fide* amateurs, applying before April 10, and the plates are to be for their own individual use only. 3. If the plates are to be sent by post, the cost of postage, 3d., must be remitted in stamps. 4. The Company reserve to themselves the right to refuse any application.

Patent News.

THE following applications for Patents were made between March 12 and March 17, 1900:—

DAYLIGHT CHANGING.—No. 4704. “Improvements in or relating to Photographic Apparatus for ‘Daylight’ Changing and for ‘Daylight’ Development.” W. WATSON.

LAMP AND DRYER.—No. 4776. “‘Kleptos’ Combined Photographic Lamp and Dryer (for Photographic Developing, Printing, and Drying).” T. L. ROGERS.

EXPOSURE METERS.—No. 4898. “Improvements in Apparatus for Calculating Photographic Exposures.” G. F. WYNNE.

DARK-ROOM LAMPS.—No. 4975. “Improvements in Photographers’ Dark-room Lanterns.” F. W. BRANSON.

OPTICAL PROJECTION.—No. 5076. “Improvements in the Means of Viewing the Enlarged Pictures obtained by Optical Projection.” J. E. THORNTON and C. F. S. ROTHWELL.

SHUTTERS.—No. 5096. “An Improved Photographic Shutter.” S. D. MCKELLIN.

FILM-CHANGING.—No. 5120. “Improvements in Means for Changing Films in connexion with Photographic Cameras.” Complete specification. C. BECK and W. BECK.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
2.....	Bradford Photo. Society	{ Summer and Winter Visits to the English Lakes. Dr. Llewellyn Morgan.
2.....	Glasgow and West of Scotland .	{ Demonstration: Carbon and Ozotype Printing. William Goodwin.
2.....	Southampton	Prize Slides.
2.....	South London	Annual Meeting.
2.....	Stafford Photo. Society.....	{ A Practical Lesson in Outdoor Photography. Reader, G. Wray.
3.....	Redhill and District	{ Demonstration: Iron Printing Process for Architects and Engineers. J. R. Gotz.
3.....	Royal Photographic Society ...	Slides Old and New. F. P. Cembrano.
4.....	Borough Polytechnic	{ A Trip to Ireland. Charles H. Oakden, F.R.P.S.
4.....	Edinburgh Photo. Society	Paper Manufacture. J. Edington Aitken.
4.....	Photographic Club	Paper by W. Thomas.
4.....	Southsea	{ Orthochromatic Photography. E. Sanger Shepherd.
4.....	Woodford	Lecture. H. W. Bennett, F.R.P.S.
5.....	Darwen	Lecture: Outdoor Photography.
5.....	London and Provincial	{ Discussion on Toning of Chloride Paper. Opened by J. E. Hodd.
5.....	Röntgen Society	{ The Influence of the X Rays upon the Growth and Development of Micro-organisms. Dr. Norris Wolfenden and Dr. Forbes Ross.
5.....	Tunbridge Wells	{ Pictorial Treatment of Lantern Slides. J. A. Hodges, F.R.P.S.
6.....	West London.....	{ Demonstration: Platinotype. A. C. Beard.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 27.—Technical Meeting,—Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

OBJECTS OF INTEREST.

Mr. E. CLIFTON showed a dark-room lamp for use with any ordinary illuminant, the front consisting of a glass dipping bath containing a solution of bichromate of potash, as suggested by Mr. Howard Farmer at a recent meeting of the Society. For the purpose of demonstrating the lamp, an incandescent electric light was adapted to it, and a degree of illumination resulted which one would have expected to be altogether impossible in a developing room; but Mr. Clifton said, corroborating Mr. Howard Farmer,

that the most sensitive plates could be subjected to it without risk of fog. Mr. Howard Farmer used a thickness of three-eighths of an inch of a six per cent. solution of bichromate, but the dipping bath attached to Mr. Clifton’s lamp measured more than an inch from front to back, and a weaker solution of bichromate could therefore be utilised.

Mr. A. A. K. TALLENT showed a photo-spectroscopic camera, provided with a prism having a grating on its hypothenuse. He explained its construction by means of a diagram, and submitted it for examination at the close of the proceedings.

SOME DEVELOPERS COMPARED.

Mr. ALFRED WATKINS read a paper with the above title, in which he detailed a series of experiments which he had conducted with pyrogallic acid, metol, ortol, adurol, hydroquinone, kachin, and glycin, each developer containing 4 grains of the developing salt, 12 grains sodium sulphite, and 24 grains sodium carbonate to the ounce of water. No bromide was used, in view of the fact, pointed out by Messrs. Hurter & Driffield, that, although the addition of bromide to the developer under certain circumstances practically alters the speed of plates, this alteration is gradually lost as development proceeds, and that, to secure a change, the plate must be taken out at a comparatively early stage of development. The first experiments were summarised in a table giving the time of appearance of the image, the total time of development required to attain a standard development factor of about 0·75, and the multiplying factor deduced from these trials; and from this table it appeared that, of the single developers, pyro stood first, being closely followed by metol and ortol, all the others taking about double the time to do the same work. A mixture of equal parts of metol and hydroquinone was superior to all the single developers in efficiency, the image appearing almost as quickly as with metol alone, while the multiplying factor was the average of the two, and the total time of development shorter than with either separately. Mr. Watkins was of opinion that any similar mixture of two developers would have a corresponding advantage. He had failed to find any evidence in support of the popular belief that certain developers yielded greater density than others. A succeeding series of slides showed a comparison of hydroquinone and metol, and illustrated the fact that, although the latter was ahead during the first four-minutes of development, by the end of the fifth minute the hydroquinone had got exactly level, and at the sixth gave a negative denser in all its gradations than that developed with metol. The difference of speed shown by three brands of plates with six of the developers mentioned (adurol being omitted) was insignificant, and the fog with all of them was about equal. It was found that the fog developed upon unexposed plates continued to increase in density, until at 150-minutes the film was practically opaque. After discussing the keeping qualities of the various developers, their power of searching out detail, and the colour of the deposit, Mr. Watkins summed up the differences found upon testing them (unrestrained) on equal terms as follows: Appearance of image, multiplying factor, and total energy, wide differences; effect on speed, very slight and doubtful difference; searching out detail, fogging propensity, and ultimate density power, no difference. Leaving pyro out of the question, the mixture of hydroquinone and metol had more energy than any single developer tried, and the multiplying factor was convenient.

Mr. W. B. FERGUSON, Q.C., said he used a mixed pyro and metol developer, and found that the time of appearance of the image was more or less independent of the quantity of metol present. With two grains of pyro to the ounce the image would appear in about thirty-five seconds, and this would be reduced to ten seconds by the addition of one grain of metol; but the addition of two or three grains of metol made no further alteration.

Mr. WATKINS said that was due to the pyro. Of all the developers he had tried, only two—pyro and amidol—produced an image in the same time at whatever dilution they were used, but, with all the others, the time of the appearance of the image varied in proportion to the dilution.

The Rev. F. C. LAMBERT asked whether the multiplying factor remained constant within certain limits of temperature.

Mr. WATKINS said that it was not influenced by temperature between 45° and 70° F.

The CHAIRMAN, referring to the question of staining, expressed the opinion that the sulphite in the developer had a protective action only for a certain time, and that eight grains per ounce, the quantity used by Mr. Watkins, was altogether insufficient. The quantity of sulphite necessary depended upon the amount of alkali to be used and the period of development, and not upon the pyro; under ordinary circumstances, nothing less than fifteen grains to the ounce of water could be regarded as satisfactory when using carbonate of soda as the alkali.

Mr. TILFOR showed some negatives which had been exposed for identical periods, and developed with a variety of substances according to the maker’s formulae, and which were practically alike in density and gradation and detail.

After some remarks by Messrs. SPILLER and WARBURG, Mr. WATKINS replied, and a hearty vote of thanks was given to him for his valuable communication.

COMING EVENTS.

On April 3, Mr. F. P. Cembrano will give the last lantern lecture of the session, and exhibit “Slides Old and New;” and at the Ordinary Meeting on April 10, Mr. Thomas Bedding will read a paper on “The Municipal Encouragement of Photography.”

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 22.—Mr. Herbert C. Rapson in the chair.

Mr. A. MACKIE passed round some negatives chosen at random from a number developed with ortol during the past year or more. They were done with the soda-carbonate and sulphite formula, but he had abandoned this, and now used carbonate of potash in ten per cent. solution, and so also with the ortol, not, of course, omitting the metabisulphite. His normal developer was 2 grains of ortol and 6 of potash per ounce. The quality of negative obtained with this was better than that previously secured, although he did not suggest that the same quality could not be otherwise obtained. He had also tried

ortol-potash developer without sulphite for bromide paper, and one peculiarity which was noticed was that ortol had a tendency to stain, not the gelatine, but the paper, as the back of the print was of the same tint as the lights on the front. In daylight the tint was very pleasing, a faint salmon tint. The deposit was not pure black, for which it was perhaps better.

Mr. F. C. KELLOW had noticed that ortol stained the celluloid of rollable film in the same manner. If the gelatine film were stripped, this would be seen.

Mr. MACKIE mentioned that, at a meeting the night before, Mr. Sanger Shepherd incidentally had particularly warned photographers not to use hydroquinone for the development of orthochromatic plates, but developers which cause the image to flash up generally, like metol, amidol, &c., instead. The reason given was that hydroquinone developed those parts first which had been acted upon by the blue rays. This would account for the fact that hydroquinone brought out the image in "jumps," so to speak. If kept long enough, the other parts catch up, it was true, but for colour work time of development was an important factor.

The CHAIRMAN, alluding to the pleasing tones which Mr. Mackie found resulted from the use of ortol with bromide paper, questioned whether the tint was a permanent one. He recalled the fact that he had printed a negative on white and on mauve albumenised paper, and at first preferred the mauve print; but in three weeks the mauve tint had turned yellow, and he was forced to admit a preference for the white paper. The same might occur with the ortol-developed bromide prints.

Mr. MACKIE could not speak on this point. He drew attention, however, to the differences in the appearance of samples of ortol which he had seen. Some was in the form of distinct crystals, other was like powder, which lung in loose lumps. He also read a note in our issue of last week, in which an American user of ortol had commented upon the same matter.

Mr. ERNEST HUMAN showed a hand camera fitted for compact metal plate-holders, which was examined in detail by those present.

North Middlesex Photographic Society.—March 19, Mr. J. A. Meen in the chair.—Mr. J. MacIntosh gave a lecture on

ISOCHROMATIC PHOTOGRAPHY.

He described the method of finding a suitable screen. Slips of cardboard were to be coated thickly with the following pigments: brilliant blue, emerald green, chrome yellow, vermillion, and white, the colours being toned down with either black or white until they gave equal depth of shadow when tested with the photometer as set forth by Sir William Abney. Thus, yellow, white, and vermillion would require the admixture of black, and the blue and green, white. These colours, if photographed with a suitable screen, would all come out of equal depth in the negative, an isochromatic plate being used. A screen could be made by coating microscopic glass (because of its thinness) with collodion, stained with brilliant yellow on one side and fuchsine (very pale) on the other. This, if of proper depth, would give the result aimed at above. He passed round a screen made with naphthol yellow and aurine, with which the specimens shown were taken. It increased the exposure fifty times. Such a deep screen was not necessary for landscape work, but was excellent for oil paintings, &c. A point to bear in mind was that you should differentiate between the luminosity and the contrasts of colours. Thus, if a picture consisted of, say, three colours of equal luminosity, they would come out with the *correct* screen, as referred to above, of one depth only in the negative, which would not appear correct, and the screen should be altered until the colour most striking to the eye was given prominence. The plates he used for the experiments were Lumière's panchromatic. Another point he mentioned was that a screen stained with picric acid was useful for photographing light clouds against a blue sky, as the blue was cut out very sharply.

Richmond Camera Club.—March 12.—A lecture was given by Mr. HAROLD MANN on the subject of

GOTHIC ARCHITECTURE.

Mr. MANN showed the transition from Norman to Perpendicular, and his remarks were admirably illustrated by over 150 excellent slides, made by Mr. T. Coys.

MARCH 19.—A lecture on

TECHNICAL CONTROL FOR PICTORIAL RESULTS,

by Mr. W. Thomas, was read. The lecture was illustrated by numerous slides, many of which were very good. The writer's literary style was, however, somewhat involved, so that it was difficult for the audience to reap the full benefit of Mr. Thomas's advice.

Newcastle-on-Tyne and Northern Counties Photographic Association.—The above Society some time ago concluded an arrangement with Mr. J. Craig Annan, whereby the exhibition of that gentleman's work, which has lately been on show in London, should be transferred from there to Newcastle-on-Tyne for exhibition by the Newcastle Society. This Exhibition took place on Thursday, Friday, and Saturday last, and proved an unqualified success. It was held in the Grand Assembly Rooms, and was visited by a large number of people who availed themselves of the Society's invitation. Mr. Craig Annan came through from Glasgow, and was entertained to dinner by the Association on Thursday night. The novel idea was carried out of having the dinner served in the fine exhibition room itself, surrounded by Mr. Annan's pictures, and the pleasure of the occasion was much increased by this means. Mr. J. Pattison Gibson presided. In proposing the toast of "Our Guest," Mr. Walter S. Corder said, on behalf of local photographers, he tendered the warmest of north-country welcomes to Mr. Annan, who, he said, was one of the foremost photographers of our time. His work had won their respect and admiration, for in it they had something more than mere technical excellence. Through it all there ran a strong individuality, which was the mark of the true artist; in short, Mr. Annan showed that it was possible to so impress a photograph with such individuality as to fulfil one of the definitions of art as

being "nature seen through a temperament." His works were an encouragement to all who were trying to give to their photographs artistic value. In his reply, Mr. Annan thanked the members present for the very cordial welcome they had given him. Art in his estimation was a sentiment, not a science, and it was only by keen observation of everything beautiful that progress could be made. Whilst good pictures should be studiously sought after and observed, the photographer should not confine himself to that branch of art alone for his education, but should carefully examine, and, as far as possible, endeavour to surround himself, with beautiful examples of furniture, china, metal and wood work; in fact, no example of fine craftsmanship should be allowed to escape observation. Mr. Annan then gave his audience some practical advice as to framing photographs, the selection of suitable mounts, and much other interesting advice. The whole proceedings of the evening were marked by great success. The pictures on exhibition have been so lately described in connexion with their exhibition in London that it is unnecessary to detail them here. During the time they have been on exhibition in Newcastle, they have proved a source of interest to a large number of visitors.

Blairgowrie and District Photographic Association.—At the monthly meeting on Tuesday it was decided to hold an open photographic Exhibition early next year, and it was remitted to the Executive to make the necessary arrangements. The success of the last Exhibition was such that the Association will require a special effort if they mean to surpass it. We would draw the attention of exhibitors to the extreme punctuality with which the last Exhibition was carried out, and we are assured that no effort will be wanting at the coming Exhibition to maintain this desirable reputation. Arrangements are in progress for the purchase of an enlarging lantern for the use of members. A background is also to be added to the accessories available to members.

FORTHCOMING EXHIBITIONS.

1900.

March 30, 31 Photographic Society of Ireland. W. F. Cooper, 35, Dawson-street, Dublin.

April 3-7 Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

. Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

. We do not undertake responsibility for the opinions expressed by our correspondents.

PLATE-BACKING AND SENSITIVENESS.

To the Editors.

GENTLEMEN.—In your article on "Plate-backing and Sensitiveness" in the JOURNAL of March 9, you refer to plate-backing as no new invention, and state "There were backed dry plates upon the market as far back as almost a quarter of a century ago." You also speak of plates being backed by some kind of dark paper in the old wet-plate work, and further remark that the dry plates referred to were backed by a red pigment. You do not tell us what dry plates these were, though you give us to understand they were not gelatino-bromide plates. Probably you refer to the uranium dry plates introduced about that time by Colonel Stuart Wortley. These plates were, as you say, backed by a red pigment, which was easily removed by a wetted sponge before development. Though not as sensitive as gelatino-bromide plates, they were capable of yielding excellent results when properly manipulated. I took a number of negatives with these plates, some of which I have by me now, and they are but little, if at all, inferior in detail or printing qualities to the gelatine plates of the present day, though they are quite a different colour. I have often wondered why, in the numerous references to early dry-plate work which have appeared from time to time, no mention has been made of these plates. As far as my recollection goes, they were the best, if not the only workable, dry plates placed upon the market prior to the advent of gelatino-bromide plates.

Within my experience of wet-plate photography, I have no recollection of any kind of backing being applied for the purpose of preventing or reducing halation. Red blotting-paper was often used to absorb the moisture at the back of the plate when placed in the dark slide after removal from the silver bath, and it is just possible the blotting-paper may have had some slight effect in reducing halation; but it was certainly not placed there for that purpose or with that intention.

The cause of halation was little known or understood by the majority of photographers in those days, and, although the effect of it was so apparent in nearly all photographs of interiors, I don't believe that one photographer in a hundred had any idea that backing the plate would prevent it. The remedy was sought in another direction. For instance, in taking the interior of a church, the east window was covered over on the outside with canvas, or some such material, and, after the necessary exposure was given to the interior, the canvas was removed and a shorter exposure given to the window. The operation was troublesome, but it was often resorted to, and the result was a perfect rendering of the window without, I need hardly say, any sign of halation. I believe there is a doubt in the minds of many photographers of the present day as to whether anything is gained by backing plates to prevent halation. With the plates I use, and have used for several years, I have not been troubled with halation either in landscape work or interiors, except in a very few instances, and have therefore found no necessity for using backed plates.

—I am, yours, &c.,
Newport, March 17, 1900.

THOS. MITCHELL.

THE ARTISTIC COPYRIGHT BILL.

To the Editors.

GENTLEMEN,—I have just received a copy of THE BRITISH JOURNAL OF PHOTOGRAPHY for March 9, in which I am reported as having said, at a recent meeting of the Society of Arts, "that photography was introduced into the Artistic Copyright Bill as an afterthought." Might I refer you to the correction which appears in that Society's *Journal* for March 2, which explains that the Copyright Bill referred to was the previous one, and not the one at present under discussion.—I am, yours, &c.,

ALFRED EAST.

2, Spencer-street, Victoria-street, S.W., March 14, 1900.

[The following is the note in the *Journal* of the Society of Arts to which Mr. East refers: ARTISTIC COPYRIGHT.—Mr. Alfred East, A.R.A., wishes to make it clear that, in his remarks in the discussion on Mr. Edwin Bal's paper on "Artistic Copyright," he stated that photography was introduced as an after-thought into the previous Copyright Bill, not, as he is reported, into the Bill now under discussion.—Eds.]

DEXTRINE AS A MOUNTANT.

To the Editors.

GENTLEMEN,—Your late remarks respecting dextrine as a mountant, in answer to a correspondent, inform me of the reason why dextrine is not in favour. I had seen its use objected to, but had never seen any reason stated; for my part, I have used dextrine for special purposes for at least twenty years, and have found no cause for discontinuing it, but have no doubt that the difference in opinions is from differences in the samples of dextrine used and in the manner of using it. If a good brown dextrine is dissolved with the aid of a hot-water bath in about equal parts of methylated spirit and water, a capital mountant results, which is best used cold, and which on account of the spirit, as I suppose, does not cockle the mounts and is always ready for use, and does not turn sour, as the large percentage of spirit arrests fermentation or mildew. For mounting large prints for framing, putting prints into scrap albums on Christmas mounts, which are often quite thin, &c., this mountant works satisfactorily, and dries readily; but, if made with water only or if white dextrine is attempted to be dissolved in the spirit and water, trouble will follow. The above solution of brown dextrine, mixed with Venetian red or burnt sienna, makes a good plate backing. There is nothing new in this, as I published the formula some twenty years ago; a sample of suitable dextrine enclosed, also print of Mr. Smart's portrait taken some fifteen years back, of which about 1800 have been supplied mounted with dextrine.—Yours, &c.,

E. WILLIAMS.
Highgate, Hawkhurst.

[We will take an early opportunity of trying the sample of dextrine kindly sent us by Mr. Williams; the print enclosed is in perfect preservation.—Eds.]

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—Mr. Lévy says in last week's issue his "letter (see February 2) was written long before 'Free Lance' ever thought about writing . . . about the metric system and its use in France." This February 2 letter actually says "I have read with much pleasure 'Free Lance's' dissertations as regards the metric system." So much for Mr. L.'s veracity.

This letter of his seems to be without meaning, except to say I do not

know what I am talking about. To prove his position he suggests that pound is a legal French weight, and part of the metrical system of weights. This is absurd. The metric system was adopted in France almost a century ago within a year; but it was not till forty years afterwards that it was made compulsory. M. Lévy knows, or, if he does not, he ought to know, that the pound is not, and was not, a legally recognised quantity in the metrical system. As proof, I refer him to the metrical tables in a work in chemistry or physics, published in this country or in France let Mr. Lévy in reply give his proof that a pound is a legally recognised quantity.

The fact is, for all ordinary purposes of life a decimal system of subdivision of weights and measures is a failure. In 1821 the U.S. Government rejected it as unsuitable to practical life, J. Quincy Adams having drawn up a report against it. The French people have discovered the same thing, and, according to M. Lévy, they don't ask for 12 grammes of coffee if they want a quarter of a pound; no, they ask for a quarter of a pound and get it, but that is not by the metric system the metric system implies decimal subdivision, and that is impractical in daily life.

FREE LANCE.

To the Editors.

GENTLEMEN,—But for M. Lévy's letter in your JOURNAL of to-day, I should not have troubled you again on the above subject, but there seems to me to be a misunderstanding between him and "Free Lance," which perhaps, I may remove.

"Free Lance" is quite right as to the British pound having no representative in the metric system, but it is quite unnecessary that it should have one; it is quite certain that our friends across the Channel can buy and sell just as conveniently as ourselves; more, it is in evidence that everybody who has tried the metric system prefers it, and that is the case even with English workmen who have been taken abroad to execute work. There is no charm in the British pound; it owes its exact determination to the Commission, who were directed to make new standards when those of the Exchequer were destroyed in the fire which burnt the old Houses of Parliament. The old standard was a troy pound, and the Parliament, in accordance with the recommendation of the Commission, declared a certain piece of platinum to be the future standard pound avoirdupois. This pound had been made, as nearly as the available evidence would allow, equal to 7000 grains of the old troy pound (5760 grains). The sole authority for this, as well as our yard, is 18 and 19 Vic., cap. lxxii., passed in 1855.

But the French word for a pound is *livre*. Now, Napoleon, in 1812, sanctioned the use of a livre of 500 grammes as part of what was called the *Système Usuel*, and the use of this was not forbidden in France till 1837. It is quite probable that the use of the word "livre" is common among the people in France, but it does not mean the old livre of the Monarchy nor the English pound, but the livre of the *Système Usuel* or half kilo, and in that case M. Lévy is quite correct in saying that it is part of the metric system.—I am, yours, &c.,

J. F. T.

EXPOSURE BY THE WATKINS' SYSTEM.

To the Editors.

GENTLEMEN,—Will you kindly correct a misunderstanding which has inadvertently crept into your report of the above lecture, probably through some omission on my part. The author of the lecture is Mr. Alfred Watkins, of Hereford, the inventor of the well-known exposure meter, who lent it to me. I simply read it and showed the accompanying slides. It is only right that I should ask you to kindly make this correction in your next issue.—I am, yours, &c.,

G. T. B. WOODLEY (President).

Doncaster Camera Club, March 23, 1900.

INTENSIFICATION AND REDUCTION.

To the Editors.

GENTLEMEN,—Referring to the admirably compiled paper on the above subject, read before the Sutton Photographic Club by Mr. J. H. Baldock F.C.S., and appearing in a recent issue, it may be of service to add yet another method of so-called "reduction," which is not so well known as it deserves to be. The procedure is simple in the extreme the over-dense negative being taken direct from the fixing bath, and placed where the air can get at it. In mild cases, fifteen minutes' exposure to the atmosphere is sufficient to tone down the excessive density of the high lights. In extreme cases the treatment may run into hours but, however long or short the time may be, the reduction proceeds on precisely the same lines as the ammonium-persulphate method, i.e., high lights first, deepest shadows last to be affected, until the desired result is

ained. In prolonged treatment it will be necessary to occasionally immerse the plate for a few minutes in the fixing bath in order to prevent drying.

If you, Sir, or some of your scientific readers would furnish us with reasons why the atmosphere affects a fixed, but unwashed, negative in this manner, it would, doubtless, interest others besides yours, &c.,
Pontypridd, March 20, 1900.

ALBERT O. FORREST.

REFLECTOR HAND CAMERAS.

To the Editors.

GENTLEMEN.—My letter regarding a hand and stand reflector camera, which you were good enough to publish in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 2nd inst., had its effect. Messrs. —— wrote that they saw no great difficulty, but it could not be carried out with their present form of shutter. Mr. ——, in a letter of the 15th inst., says: "I have considered carefully your letter, and we come to the conclusion that what you describe is quite within our power to make, provided the price would not be too much. But, with so many alterations, we could not undertake to make such an instrument less than 15*l.* If you desire to have us make one for you, we would do so with pleasure. We would require a sketch and written description."

Don't you think that short-sighted on the part of the maker, and hardly fair on the proposer, who makes a suggestion, not with the idea of gaining a royalty, but for what it may be worth *pro bono publico* or *pro bono fabri*? Suppose I were to send that 15*l.*, with the sketch and specifications—by the way, if I were successful in drawing out these, I could deserve a prize for ingenuity, for I have never had a reflector camera in my hands, nor any closer model than the Kodak genus—what would happen?

The maker would make me my camera, for which he would be amply paid for the extra trouble, and at the same time he would make one or two others, and, if they found a ready sale, within a year he would put the market much improved ones, probably at about a third of the price.

No, that is not good enough for me, and, failing to get such a camera elsewhere, I should prefer to wait till the idea germinates, and in the meantime scrape along as before.

My suggestion, shortly summed up, amounts to this: A compact box reflector camera, but capable of extension without appreciable increase in bulk, and only a slight one of a few ounces in weight—much less than a loaded magazine form. The reflecting arrangement would not be indispensable when the camera was extended.

I am writing to Messrs. Watson & Co., as you suggest, but I was well acquainted with their advertisement in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC. Their camera may fulfil "R. N. R.'s" requirements, but they cannot have read my letter; their employment of a long-focus lens, in the first place, would militate against my proposal. The Continental manufacturers' designs are mostly too complicated or clumsy, but that seems to show that they are groping their way in the direction indicated, and that my idea is more or less practical, and ought to bring profit to the manufacturer who worked it out properly.—I am, yours, &c.,

A. G. B.

NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

To the Editors.

GENTLEMEN.—In last week's JOURNAL our mutual friend "Cosmos" wishes to know details as to the working of the Record Association. I regret that my father, Mr. George Scamell (the Hon. Secretary), is at present in Italy for a holiday, and cannot therefore promptly give the information desired.

On p. 591 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC is given a list of the officers. Membership is open to all, the qualification being (1) contribution of photographs to the number of six approved prints for the year; or (2) a subscription of not less than ten shillings per annum. I am sure the Council will welcome any hard workers, such as will help to ensure a continuance of the good work, either active photographers who will contribute prints, or men who can and will work in other directions, such as bringing the Association to the notice of the many who could be of service to it, if only they were once introduced to, and interested in, its mission.

At present it has no "home" of its own, meetings having been held at St. Pancras Grand Hotel and 66, Russell-square. Any prints forwarded to the latter address, or to 21, Avenue-road, Highgate, London, N., addressed to the Hon. Secretary, will be duly acknowledged with thanks. I enclose a copy of the rules and by-laws.—I am, yours, &c.,
120, Crouch-hill, N., March 27, 1900.

EDGAR SCAMELL.

Answers to Correspondents.

* * * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

A. J. Ashbolt, 10, Exmoor-road, Southampton.—Photograph of A. Turner, footballer.

G. Denney, 21, St. Sidwell-street, Exeter.—Photograph of the Rev. — Weeks, Rector of Majestic.

TAFFY; "SCUMY TYPE;" AMERICAN; PHOS; and others. In our next.

J. KENNERELL.—We are very much obliged to you for your letter, which it would, perhaps, be inadvisable to publish. Nevertheless, we will retain for reference.

DARK VIGNETTES.—J. W. D. says: "Please inform me if the enclosed is correct for the above, as I have never seen any."—It is something like them, but is a very poor example. It is very much under-exposed, and does not show so much figure as is generally included.

VESSEL FOR WASHING PRINTS.—AMATEUR (Leeds).—A zinc tray, such as you employ in carbon printing, is not suitable for fixing and washing silver prints in. It may, however, be used if the surface of the metal be protected by some impervious material, such as Aspinall's or similar enamel.

PATENT QUESTION.—G. H. RHODES writes regarding apparatus for producing buttons with photographs on the face of them. "If I bought one of these machines, should I be infringing any patents in England? because some of the buttons sold here are stamped as being patented."—In reply: The use of the machine would involve no infringement.

PLATINUM PRINTING.—BEAUCHAMP asks: "Can you tell us what is at fault with enclosed platinum prints? All our printing lately has turned out like it."—It seems very much as if the trouble was caused by scum on the developer. If that is not the cause, we would suggest that you send one or two examples to the makers of the paper and ask their opinion.

RESIDUES.—G. COXHEAD. The gold wastes may be added to the silver wastes, and reduced together, but it is very much better to keep them separate. If they are reduced together, a "parting assay" has to be made of the resulting metal, to ascertain the proportion of gold it contains, which is often too small to be taken into account when it is diffused through a large quantity of the baser metal.

THINNING ENAMEL COLLODION.—C. BRIGDON. The collodion, which has become thick from the evaporation of the solvents, may be thinned with ether and alcohol. It was probably made with equal parts of each; but, as there is little doubt that a larger proportion of the former has evaporated than the latter, more of that should be added than of the spirit—say, two parts of ether to one of alcohol.

THE WATKINS SYSTEMS.—EXPOSURE writes: "Is Watkins' method of exposure and timing development published in book form? if so, where can it be purchased and price?"—in reply: Mr. Watkins has not gathered his many useful papers into book form. The simplest way in which our correspondent could ascertain which papers or articles Mr. Watkins would recommend to the student would be to inquire of him at Imperial Mills, Hereford.

PHOTOGRAPHING A TABLET.—AJAX says: "I want to photograph a plaster cast of an inscribed tablet. The inscription is in relief. Circumstances oblige me to photograph it out of doors. I can arrange that the light shall fall on one side, or full front, or I can place it in the shade. Which would be best?"—Place the tablet so that it is illuminated by a fairly strong side light, so that a shadow is cast from the relief inscription. That will give prominence to the lettering.

FORM OF STUDIO.—T. W. ASTON.—Considering the space available and the surrounding buildings, we should advise you to have the lean-to form of studio, built against the back of the house. You will then get a studio nearly thirty feet long, with an unobstructed north-west light, and be well shielded from the sun during the greater portion of the day. The arrangement of blinds, as shown in Sketch 2, is quite right, but we should recommend them to be of a light green or blue colour in preference to white.

AGREEMENT.—A. Z. We have read the copy of agreement, and we should say you would be very unwise to sign it without due consideration. It seems one-sided, and all in favour of the employer. As at present worded, amongst other things, he can discharge you at a fortnight's notice, and you will be prohibited from starting business or entering the service of another photographer within a radius of a hundred miles. Taking it altogether, we never read such an unreasonable agreement before.

LENS FOR STUDIO.—CRANION writes: "I propose making use of a very short studio, say, about fifteen feet. Can you recommend me a lens that will take both full-length and cabinet heads? Also where I am likely to procure same or second-hand, and about what price should I have to pay for same?"—We know of no cabinet lens that will take a full-length satisfactorily in so short a studio. There are lenses that require only about fourteen feet between sitter and camera; but, of course, they could not be employed in a studio only fifteen feet long. Get a catalogue from any of the second-hand dealers, Morley & Copper, Upper-street, N., or Sands & Hunter, Cranbourne-street, W.

COPYRIGHT.—INQUIRER writes: "1. A picture is given away with a weekly periodical, I copy this, and obtain some cabinet prints from the negative, not for sale, but just to give away to my friends; do I render myself liable in any way whatever in doing this? 2. I take a lady's portrait in the studio. To whom does the copyright of that portrait, apart from the negative, belong? I am given to understand that the copyright of the negative belongs to the photographer, but that of the photograph itself to the sitter, is this correct?"—In reply: 1. Presumably the picture was copyright; if so, you render yourself liable to an action. 2. If the lady paid you, the copyright is hers; if not, it is yours; in either case the negative belongs to you.

AN AGENCY QUESTION.—NOVICE says: "I have lately registered and built an accessory for the studio, and granted to a leading firm of dealers the sole agency on consideration that they push the sale of it—I to supply them at a certain price, they to charge a certain price to other dealers, and another price when sold retail. I want to know if I am at liberty to sell them myself retail at the price decided (that is, the retail price), or if I must hand over the extra profit so made to the sole agents. Nothing has been said about this in our agreement."—It is quite a matter of arrangement. We should say, as you have appointed a firm as your sole agents, you should only supply through them; but, as we have said, it is a matter of arrangement entirely.

PHOTOGRAPHING ON WOOD.—C. DIGGINS writes: "Can you enlighten me in making photographs from negatives on wood, the same as an engraver would use? Occasionally I have different articles to photograph to size, and my client wants me to put them on wood. Now, what I have seen appear to be on the wood without any basis, such as collodion gelatine. Now, what I want to know is, how should I prepare the wood to make it sensitive, so as I could print from the negative to the wood instead of paper?"—One of the best methods is by the carbon process, employing a tissue that contains a large amount of pigment in proportion to the gelatine. The powder process may also be employed. There are other methods, but the most successful workers, who do the work commercially, do not, as a rule, publish the methods they employ. Those we have mentioned, however, are used in practice, and yield good results.

DARK-ROOM ILLUMINATION.—G. J. SMITH writes: "In the last edition of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, p. 803, there is an article 'Abolishing the Dark Room,' by Mr. E. Howard Farmer—a paper read before the London and Provincial Photographic Association—but I imagine it is much abbreviated; it also refers to a communication to the Royal Photographic Society in May 1898. I should be glad to know where I can obtain the full text of both papers and the price of the same, also where can I obtain the formula of the light filter therein referred to, and the ingredients for the same, and price of former and latter?"—In reply: Mr. Farmer's paper in the ALMANAC is complete. The paper read at the Royal Photographic Society can be had of the Secretary, 66, Russell-square, W.C., for 1s. In this JOURNAL, March 16, a report of another paper also appears. Doubtless a letter to Mr. Farmer, at 309, Regent street, W., would elicit further information.

SHADOWLESS PHOTOGRAPHY.—P. P. P. says: "I am greatly obliged by your reply to my query respecting 'shadowless' photography, but the chief point in my letter seems to remain unanswered. If I were asked to produce a photograph of, say, a saucepan with the lid apparently suspended above the saucepan, how could I 'arrange' these, 'showing them in perspective, one above the other, without the slightest sign of shadow or reflection,' as shown in following rough sketch, which is a similar subject to the photograph I sent you? I can understand an egg being made to lie on glass by placing it on a small heap of sand, but to place a saucepan lid on edge is a totally different matter. Even if the saucepan and lid could be placed in position satisfactorily, by looking directly down at them one would get a view thus, or nearly so [sketch]. My difficulty is not taking the photograph in a vertical direction, but arranging and fixing my models in the position required, and showing them in perspective without reflection or shadow?"—Suspend the lid by a thread above the saucepan, and illuminate by a nearly direct front light, softening the shadows with a reflector. We again advise you to get a practical photographer to give you some instructions in lighting, as you appear to lack even an elementary knowledge of it.

STEREOSCOPIC PHOTOGRAPHY.—WALTER SCOTT says: "I have recently been reading your very interesting and explicit article in the 1900 ALMANAC on 'Stereoscopic Photography.' I have had four years' experience ordinary work, and have been very successful, but have never tried stereoscopic work, and would like to do so. (1) I would like to project the pictures on a screen from my enlarging lantern, and view them means of such an apparatus as described by you on p. 665, and used Mr. Knight. I should only exhibit to two or three friends at once. Please say if you think this would be a success, and if the apparatus described is made commercially; and also (2) if the apparatus in fig. p. 670, can be bought, and where?"—In reply: 1. The system described was successfully tried at a meeting of the Camera Club last year. I cannot say if the apparatus is obtainable, but a letter addressed to M. J. H. Knight, Farnham, Surrey, would, no doubt, elicit the desired information. 2. So far as we know, it cannot be bought; it is the invention of Sir Howard Grubb, Rathmines, Dublin.

MARKINGS ON PRINTS.—E. WILLIAMS writes: "Please oblige by giving your opinion as to what is wrong with the enclosed prints. They were made in the usual course on —'s paper, toned with a sulphur cyanide and gold bath, fixed in fresh hypo ten minutes, and washed about ten changes of water during a period of thirty-five to forty minutes, all well and separately handled and passed from dish to dish separately, and dried between blotting-paper. The prints were placed in a picture frame in contact with the glass, backed with waxed paper as sample enclosed, secured with back board, and exposed on a stand out of doors, subject to damp, frost, daylight, and sunshine from Christmas until yesterday. Have never seen anything like it before. Some edges of the prints, you may notice, have been protected from light by being overlapped by the next print, and have in such portion remained in good condition. There is one interior print which, curiously, has remained in better condition. Probably this was one of another batch of prints."—The trouble is due to faulty manipulation. Either imperfect fixation or insufficient washing, probably the two combine. The exposure they have been subjected to has hastened the fading, but they would otherwise have faded, sooner or later. The print that has stood evidently received better treatment in its production than the others. Had they received a similar, they would also have been in the same condition.

LENS QUERIES.—FOCAL LENGTH asks: "1. What is the diameter of the circle of illumination given by a good half-plate R.R. at full aperture $f/8$, with an angle of 75° , and, if such a lens were used on a half-plate camera, would its covering power at $f/8$ be sufficiently good to enable the use of the rising and falling front, without cutting the picture also, with this lens at $f/8$, how large a circle would it give free from astigmatism? 2. For general work, do you advise a half-plate or 5×4 ? 3. If you advise a half-plate set, and I have a single landscape lens of $9\frac{1}{2}$ -inch focus, and wished to buy the R.R. $f/8$, would such a lens for general work be quite satisfactory, as regards perspective, which had a focus of 8 inches for a half-plate? I shall be much obliged if you will give me your opinion, for some people for the same size plate advise a focus of $7\frac{1}{2}$, $8\frac{1}{4}$, $8\frac{1}{2}$, and even 9 inches. I have understood that, provided the focal length is not less than the diagonal of the plate, the perspective will be satisfactory. 4. For general work (when extremes of instantaneous work are not desired), do you advise the euryscopic $f/6$ or the R.R. $f/8$?"—In reply: 1. The circle of light depends upon the focal length of the lens, and the distance its components are apart. A "half-plate lenses" are not of the same focus, and some are nearer from astigmatism than others. 2. Half-plate, perhaps; but it is quite a matter of taste. 3. The longer the focus the better it will cover the plate with a large aperture. Yes, the perspective will be satisfactory. 4. The euryscope will, when worked with its full aperture, be the quicker lens. Both forms are good, and, when stopped down to the same ratio, there is not much to choose between them, supposing, of course, they are of equal quality.

STUDIO-BUILDING.—ANXIOUS INQUIRER writes: "Will you kindly bear with my ignorance, and help me in my difficulty? I have been working photography as a business for the past four years. I converted my back yard into a studio. I have worked up a little connexion, and do not wish to leave here. The landlord (my next-door neighbour) has given me the wash-house joining the back yard (as per sketch), which I wish to make into a studio and so secure a side light. I beg to ask if you will kindly (1) give me measurements as to the building of a studio with a north-east light. You will notice I can only make it twelve feet long up to the landlord's workshop, but I can get back in my back yard another twelve feet. My idea was to have two doors to open wide from the present wash-house door, so as to get back with the camera (2) I want to know if the side light will be sufficient. (3) The materials it should be built with and probable cost. I don't mind going to 40/- including pulling down, &c. (4) The best position for door to get into the garden from studio. (5) If my ordinary half-plate camera lens R.R. will be quick enough for studio with special rapid plates?"—1. The position, as shown in the sketch, is a very awkward one. We should suggest that you have a door in the wash-house, when converted into the studio, so that the camera can be taken into the garden as occasion requires. 2. We think so. 3. Probably the district surveyor will require the structure to be of brickwork and glass. We cannot say the cost. 4. About the centre of the studio. 5. Yes, but a portrait lens would be quicker. We are not quite sure, however, that we fully understand the sketch. If you get Bolas' work on studio-building (Marion & Co.), you will find much that will be useful to you in it.

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NOTICE—GOOD FRIDAY.

* * * As Good Friday falls next week, THE BRITISH JOURNAL OF PHOTOGRAPHY will be issued a day earlier than usual, namely, on Thursday, April 12. Will our correspondents therefore kindly make a point of addressing their communications to us no later than Tuesday morning, the 10th inst?

EX CATHEDRÂ.

The Copyright (Artistic) Bill was last week introduced to the House of Lords by Lord Monkswell, who, in moving the second reading, said the Bill had been redrafted by Lord Thring. It differed from that of last year, not only in form but to a considerable extent in substance. Under last year's Bill a longer and shorter term of copyright was proposed for different kinds of artistic work. This Bill swept away this distinction, and gave the longer term for every description of artistic work. Lord Monkswell admitted that this Bill was put before the House in a tentative form. At an earlier stage

of the proceedings Lord Balfour said that on behalf of the Board of Trade he did not propose to offer any objection to the second reading of the Literary Copyright Bill, also introduced by Lord Monkswell, or to the appointment of the Select Committee. That assent, however, must not be taken to imply that it would be convenient at the present time to pass that Bill and the Copyright (Artistic) Bill into law. The Bills were not the same as those which were passed through certain stages last year, and which were then sent to various colonies for their observations, and it would be obviously undesirable that Bills which differed from those which had been sent to the colonies should make rapid progress through Parliament until a full opportunity had been given to have answers received from the Colonial Governments.

* * *

FROM the quoted remarks of Lords Balfour and Monkswell it is fairly certain that the Artistic Copyright Bill stands very little chance of passing into law this session. As it appears in our pages last week, it must not be looked upon as having assumed final form; and, when it has reached that shape, there is an official pledge that the Imperial Colonies shall have a voice in the matter. All this takes time, and it is hardly probable that three months, in the present state of National affairs, will suffice to obtain Colonial opinion on an amended Bill and pass it through both Houses of Parliament. Meanwhile we imagine that photographers, by their representatives, will endeavour to be heard by the Select Committee to which the Bill has been referred. The Committee of the Photographic Copyright Union and the Copyright Committee of the Royal Photographic Society have, we understand, formed a joint committee, with a view to taking concerted action in the matter. We may safely conclude that the progress of the Bill will be jealously watched, and that no effort will be wanting to exclude from it the harsh and hostile photographic—or rather anti-photographic—clauses which disfigured last year's Bill.

* * *

WE referred last week to the stereoscopic photographs of military subjects appearing in the *Royal Magazine* for April.

The veteran photographer, Mr. H. N. King, of 4, Avenue-road, Shepherd's Bush, W., tells us that the pictures were made from his negatives; at the same time he has submitted to us a large and interesting series of stereographs, having very great present interest, when the war in South Africa is the one subject uppermost in men's minds. These binocular views represent various types, home and colonial, of khaki-clad warriors, royal personages and equipages, and many other groupings which will appeal to the imagination and the patriotism of the people at large. Mr. King, who has lately executed a great deal of binocular work, supplies transparencies as well as slides, and we are pleased to give publicity to the fact that the war has recently kept his camera in constant use.

* * *

OUR contemporary, *Country Life*, announces a photographic competition, flowers being the objects towards which entrants are invited to point their cameras. We have much pleasure in giving full details of the competition on another page, as we consider that the photography of flowers is a branch of work which deserves to be encouraged. It lays a tax on great technical skill, and at the same time leads the mind to study some of Nature's most interesting and beautiful productions. *Country Life* is an elegant journal, which appeals to people who live in and love the country, and the editor states that he is always glad to see photographs from amateurs and others upon matters pertaining to country life in any of its aspects. The number before us contains several well-printed reproductions of photographs of the Duchess of Newcastle's hunters. They are from the skilful hand of Mr. Thomas Fall, of Baker-street, and the characteristic points and beauties of the animals are shown to perfection.

* * *

THE important case of the Thornton-Pickard Manufacturing Company *versus* Thornton was tried by Mr. Justice Kekewich on Tuesday last, occupying nearly the whole of the day. Briefly, the action was brought to restrain Mr. J. E. Thornton from engaging in the manufacture of films at Altringham or elsewhere, on the ground that when, some few years ago, he sold his business to the plaintiff Company, he covenanted not to engage in a similar business or the manufacture, among other things, of photographic "appliances." One of the points for the Judge to decide was whether celluloid films could be termed "appliances." The evidence of Messrs. Andrew Pringle and Chapman Jones tended to show that, in photography, the word "appliances" had a comprehensive meaning, and could be taken to refer to anything used in the production of a photograph. In the course of his judgment, his Lordship made it clear that he regarded films as appliances, but he decided the case in favour of the defendant, Mr. Thornton, on the ground that the clause of the agreement which formed the cause of the action was too wide and prohibitive. A large number of witnesses had been subpoenaed, but, in addition to Messrs. Pringle and Jones, only Mr. Pickard, Mr. Thornton, and Mr. Rothwell were called. The effect of the judgment will be that Mr. J. E. Thornton will proceed with the manufacture of celluloid films at Altringham, in which place the Thornton-Pickard Company will also continue to produce their well-known shutters, cameras, &c. As impartial observers of the

affair, we should say it is feasible that the two businesses can be carried on side by side without clashing to any appreciable extent.

* * *

WE have much pleasure in drawing attention to the fact that, under the auspices of the Croydon Microscopical Natural History Club, a lecture will be held at the Public Hall, Croydon, on Tuesday, April 24, at eight p.m. precisely, when Dr. Chisholm Williams, F.R.C.S., &c., and Dr. F. S. Pepperd M.A., &c., will deal with the subject of "Röntgen or X-Rays in Peace and War." The whole subject will be thoroughly demonstrated, many beautiful electrical and other experiments performed, upwards of 100 limelight views of the actual possibilities of the new light will be shown, and its great value to surgeons in time of peace and war. The nett proceeds will be devoted to the X-Ray Department of the City Orthopaedic Hospital, Hatton-garden. Tickets, 1s. each, may be obtained of Messrs. Roffey & Clark, High-street; from Mr. Pusey, the Hall; or from the Hon. Sec., at 11, Park Hill-rise. I hope there will be a good attendance of members and their friends on this special occasion.

* * *

WE are requested by the Secretary to the Royal Commission for the Paris Exhibition to announce that the Congress of Photography will be held in Paris from July 23 to July 27. Any further particulars may be had by applying to the Organizing Secretary, M. Pector, rue Lincoln, 9, Paris. He has already given an outline of the proceedings which will engage the attention of the Congress. The sizes and thicknesses of photographic plates is one of the subjects that will probably be brought before it, and we understand that in connexion the British plate and camera-makers will take joint action with a view to put the Congress in possession of their ideas on this important matter.

* * *

AT a recent meeting of the Photographic Society of Philadelphia, Mr. F. E. Ives submitted some interesting criticisms of Professor R. W. Wood's diffraction colour photographs. In his opinion, one of the principal defects of the process was crudeness of the colouring. Theoretically, the diffraction prints diffract, or it does not diffract (there is no half way about it); consequently one would naturally expect that with a diffraction print you would get simply red or green or blue light, or mixtures of these colours, two and two, or three and three, and not get mixtures of these colours in different proportions. That is what one would expect from examination of the theory; but Mr. Ives pointed out that it sometimes happens that in photographic processes we realise conditions which do not appear to quite sustain the theory. Sometimes we get results which we would never prophesy if we based our opinions entirely upon theoretical considerations; so Professor Wood hopes that in practice, by modifying his method of procedure, he will get gradations in the images. He thinks he has made some advance in that direction, and he has shown Mr. Ives some prints to show his advance. The results, in the opinion of the latter gentleman, are better than those first shown, but still the colours are crude in comparison with the colouring of the kromskop images.

VIGNETTED NEGATIVES.

MOST photographers who are particular as to the excellence and uniformity of the portraits they issue are fully aware that the extra price charged for vignettes does not mean so much extra profit, particularly when the printing is intrusted, as it often is, to careless printers or inexperienced girls and apprentices, account of the great waste entailed. With this fact before us, it becomes somewhat a source of wonderment that the negatives themselves are not vignetted in the first instance. If they were, the prints could be made with no more trouble or waste than fully printed ones, and, what is more, they would be uniform so far as the vignetting is concerned.

In the *pre-carte-de-visite* days, when, perhaps, only one or two prints were required from a negative, the present system of vignetting became adopted, and it has generally been followed ever since, notwithstanding that the prints are now usually ordered by the dozen. When only a print or two per negative are required, the present method is, perhaps, the easiest, but in the case of dozens it is a different matter. In establishments, however, where uniformity of results is a consideration, the waste is considerable, even when the printing is done by careful hands. Therefore, as we have just said, it is a little surprising that no attention seems to have been paid late years given to the vignetting of the negatives. That may easily be done by the operator, who, when he takes the portrait, is the best judge as to how much of the figure should be included in the finished picture.

The first vignetted portraits produced were Daguerreotypes, and they were taken direct in the camera. Not only were Daguerreotypes made, but glass positives were also produced in the same style. The different methods by which these pictures were produced are equally applicable to negatives, and these also were produced in the early days. We shall describe some of the methods, and it will be seen that they are all very simple, though some of them actually formed the subject for patents many years ago.

Here is a method that was in vogue in the late forties and early fifties: A mask was placed in the camera, with an opening including as much of the figure as was desired—of course, out of the focus of the lens. After exposure a reverse of this mask was put in front of the plate, which was then exposed a second or two to diffuse light. If this second exposure were omitted, it is manifest that the vignette would be a dark or black margin. Another method was to interpose between the sitter and the camera a white, or very light, screen, with an opening with serrated edges through which the figure was seen; the result was a perfectly vignetted picture. Sometimes the screen was suspended and set swinging during the exposure. A modification of this system was to pose the sitter before a light background, and then have a half-screen, a slightly darker tint than the background, placed between the sitter and the camera, so as to shade off as much of the figure as was deemed necessary. Sometimes this screen was loaded with cloud effects, which greatly enhanced the picture. This system was also in vogue in the Daguerreotype days.

Here is an early method of making vignetted negatives: A mask with a serrated opening is placed in the camera between the plate and the lens—of course, well out of its focus, and the exposure made in the usual way. After the exposure has been made this mask is removed—slid out of the camera, and a reverse of it slid in and a second exposure made—this time to a white screen.

About 1864 the late Mr. Napoleon Sarony took out a provisional protection for this system of producing vignettes in the camera, but the patent was not completed, probably because Mr. Sarony found that the idea was by no means new. It is well to note, however, that Mr. Sarony mentioned that the second exposure might be made, with the lens in focus, to a light screen, on which were some hatched lines on scrollwork.

Another method of making vignetted negatives was published by the late Mr. Adam Salomon in the very early seventies. It was this: He took a piece of ground glass, the same size as the focussing screen, upon which it was placed, and, while focussing, on it he roughly sketched with pencil an outline of so much of the figure as he wished in the finished picture. The exposure was then made in the usual way. The exposed plate was then taken into the dark room; here a mask, roughly corresponding to the sketch on the ground glass, was cut out of black paper, and used to shield the exposed portion of the negative while it received a brief exposure to a weak white light from a small window in the dark room, a piece of cotton-wool being used during the time to soften the vignetting.

The method we described a few weeks back for producing vignettes with dark margins, by the interposition of a screen between the sitter and the camera, is equally as applicable to the production of those with white ones, by simply using a white or light screen instead of a dark one. Indeed, the screen may be dark on one side and light on the other; thus one screen will serve for both styles of picture; or, if grey or tinted margins be desired, the screen may be of a more or less intermediate colour.

We have not here described all the methods by which vigneted negatives may be produced, but we have indicated enough to enable any photographer to adapt or modify any of those referred to to his particular requirements. On a future occasion we may have something more to say on methods of vignetting.

Material Nature of Radium Radiation.—The rays emitted by this newly discovered body possess exceptional interest from their resemblance—with a difference—to Röntgen Rays. They, as we have before pointed out, act upon a photographic plate, yet differ in regard to their penetrative power with regard to several substances transparent to the older rays. The exact nature of the radiation whose discovery we owe to Röntgen is still matter of discussion, but they are understood, on the whole, as conditions of ether. Radium, on the contrary, as far as recent investigations have pointed out, owes its action to the efflux from it of material particles. Naturally the first objection that would arise as against this is that the emitting body would, in case of the hypothesis being proved correct, gradually become lighter in weight by the loss of substance. But M. Curie has shown that the charges carried off are so feeble that some millions of years would be required to remove one milligramme of radium in the case even of the most intense radiation that has yet been noticed. An article in a recent number of the *Revue Générale de Science*, as quoted in the *Chemical News*, describes some of the most recent investigations of M. and Mme. Curie, in which, by means of a series of intricate and most delicate experiments, they have obtained evidence which is almost conclusive as to the materialist theory of the radiations from the new metal. It would be foreign to the needs of these pages to describe them, they being mostly of an electric or magnetic nature, but we may say that the paths of the particles have been determined and opaque objects have been placed in the paths of their trajectories, and the particles in one path filtered out, as it were, from those in another. It is, however, of sufficient interest, as connected with photography, to place here on record.

To Ignite a Gas Jet without Exploding the Generator.—The laboratory experiment of making hydrogen gas and igniting it at a burner has little interest for photographic readers, but with acetylene experiments on a small scale the same difficulty would arise as with hydrogen, i.e., the possibility of producing an explosion if all the air be not expelled. Mr. C. G. Hopkins, in the *Journal of the American Chemical Society*, describes a method of avoiding all danger in the experiment. The usual instruction is, "When the gas is coming off freely, light the jet." Too frequently an explosion follows the application of the light. Mr. Hopkins recommends a test tube to be filled with the issuing gas, the tube then to be ignited at its mouth, and in its lighted state transferred to the issuing gas. If the gas is explosive, it would explode in the test tube, but, if the tube can be carried still aflame to the jet, the gas will be safe, and will light at the generator orifice.

Photographic Search for an Intra-Mercurial Planet.—Professor W. H. Pickering, in the *Harvard Observatory Circular*, describes a method which he has devised, and will carry out in the next Eclipse Expedition. The plan is founded on the fact that "the faintness of a star that may be photographed with a given instrument against a bright background of the sky depends within certain limits directly on the focal length of the lens, and is independent of its aperture." In a previous circular he had shown that "three minutes after the pole star first becomes visible to the naked eye in the evening, the sky surrounding it is of about the same photographic intensity as that of the sky near the sun during a total solar eclipse." He uses a photographic lens of 3 in. aperture, and 11 ft. 4 in. focus, its field being sufficient to include four 10×8 plates. Exposing for one minute to the region of the pole, within three minutes of its having become visible, the light of the sky fogged the plate slightly, but not sufficiently to obliterate the star images. Four such instruments will be employed, and the expectation is that, if there be any planet, it would in the same way as the pole star impress its image, notwithstanding what might be termed the faint sky glare.

New Mode of Fireproofing.—The U. S. Consul at Freiburg has been describing a new industry that has been started there—a method of making materials fireproof at a slight cost. We have often drawn attention to the premiums required for photographic studios, and any practical method for decreasing fire risks ought to have an effect in reducing rates, which we have before stated to be unjustifiably heavy. The new method treats goods quickly, and in the case of woven fabrics, such, say, as studio curtains and the like, the treatment does not interfere with their texture, fibre, colour, or weight, and the extra cost is slight. Consul Liefeld experimented with materials treated with the new method, and found that even a lighted candle failed to ignite them, it merely charred them. He then poured kerosene oil upon the articles and set fire to it. The fabric was simply charred where the flame travelled, but did not burn. A piece of wood enwrapped with some of the fireproof fabric, and placed for a few moments on the red-hot coals of an anthracite furnace, was found to be uninjured except where the coals had touched it. The only disadvantage of this new material seems to be that it is only of use for indoor purposes, as rain would dissolve away the protective material, but this would be quite immaterial in photographic apartments. The cost is stated not to exceed three half-pence per square yard of material, and the increase of weight to be only about a pound for every fifty square yards.

Influence of X Rays on Selenium.—M. Perreau has lately made a number of researches as to the effect produced by X rays upon selenium, and has presented his results to the Academie des Sciences. He finds that selenium, which is sensitive to light, is also affected by this form of radiation. The experiments were carried out with a selenium cell made up in the usual way with brass strips $\frac{1}{16}$ mm. thick, separated by strips of parchment paper of $\frac{1}{10}$ mm. The cell, contained in a zinc box and covered by a sheet of aluminium, was placed in circuit with a Daniell element, a resistance box, and a galvanometer. The resistance of the selenium was found to be 40,000 ohms in the dark, and, when exposed to diffused daylight or to a gas burner at a distance of $1\frac{1}{2}$ metres, this fell rapidly to 33,000 ohms, coming back to its original value in the dark.

THE PHOTOGRAPHER'S YEAR.

APRIL.

"WHEN that April with his showers sweet
The drought of March has pierced to the root,
And bathed every vein in such liquor,
Of which virtue engendered is the flower;
When Zephyrus also with his sweet breath
Inspired hath in every holt and heath
The tender crops, and the young sun
Hath in the Ram his course run,
And small birds make melody,
That sleep all night with open eye,
So pricketh them and nature in their courage,
That folk long to go on pilgrimages,

* * * * *

And specially from every shire's end
Of England, to Canterbury they wend,
The holy blissful martyr for to seek,
That hath helped them when they were sick."

Slightly altered to rid some of the words of their archaic form and endings, these, the opening lines of the prologue to the "Canterbury Tales give the first reference to April in modern English. They are the placidly laudatory ones, general in tone, that would be expected from Chaucer as a Londoner bred and born. Much like the Londoner of to-day, his knowledge of the country was probably rather vague, more in the abstract than the reality of close and loving observation. It has nothing, for instance, of Blackmore's love, as shown in his very fine description in *Lorna Doone* of the opening of a Devonshire spring. Nor that we would begrudge the former his lack of this particular knowledge and description if it were to be gained, as it probably would, at the expense of the priceless picture of the

"Nine and twenty in a company
Of sundry folk by adventure befallen,
In fellowship, and pilgrims were they all
That toward Canterbury would ride,"

whom he came across in "The Tabard Inn in Southwark." The country between the Tabard and the objective point of the pilgrimage—the tomb of the canonised Becket at Canterbury—is much the same to-day as it was then, and we can enjoy it at our leisure; but the vivid and visible description of the pilgrims, representative figures of the English life of six centuries back, we emphatically cannot afford to be without. Would there had been a photographer amongst them! How inestimable valuable would his prints be to-day, although taken by a fourteenth century process, of the knight, squire, yeoman, clerk, shipman, doctor, miller, reeve, and the rest. Alas! it was out of the question, and we have to come much further down the stream of time before the photographer presents himself. Our philosophical consolation must be found in evoking hopefully forward rather than regrettfully backward, and believing that our posterity will be more blessed than we are in this respect. Sir Benjamin Stone will possibly be regarded in the twentieth century as the photographic Chaucer of the twentieth, and his shade, let us trust, gain an appropriate and a pleasing reward in being conscious of the fact. Those of most of the rest of us will, I doubt, remain instead the dead-sea fruit reward of having, when the opportunity was also ours, seen too much in the utilitarian view of the American who asked, Why he should think of his posterity? What had it ever done for him?

Returning, however, to our more practical object, the photographic sequence of the months, April must without hesitation be regarded now as in the time of Chaucer, as a month of showers. Here we are on travelled ground, as such pictures as *Sunshine after Rain*, *A Passin Shower*, and so on, prove. Working conditions are very different to those of March. The light passing through air well washed of all impurities can hardly be better in quality. The great drawback is, that as yet there is no photographable foliage. The thin, hazy cloud of green over tree and hedge is very pleasant in its suggestion of the fuller life so near at hand; but, however scientifically conscientious the lens in its rendering, the result upon the plate is a blur, and not faint colour. No sentiment can be worked in a homoeopathic fashion into the constitution of any emulsion, to help matters out. As the result of observation, and failure, the workers who have gained the best typical results in April have turned to the broad masses of light and shade that suggest the characteristic coming or passing shower. This is advanced work. Watching a shadow and a gleam of sunlight as they pass over the face of the earth, and arresting them in a second at the exact point in their course at which their value tells to greatest advantage, must be regarded

as rising to the greater heights of photographic art and practice. Watching shadows is of necessity bound up in also watching the clouds by which they are produced. He who would have April pictures must introduce clouds into them; and the additional truth will soon be borne in upon him that pictures taken in any other month, to be at their natural best, must also have clouds, not the smoked-glass or cotton-wool clouds. There are many ridiculous things in photographic practice: the cast-iron posing of the studio, modelling a face, or smoothing out its expressive wrinkles, deliberately throwing the focus out of tune with the view to gaining a so-called "impressionist" picture, may be quoted as some instances. But these are trivial compared with the colossal assurance of competing with the Almighty in making and arranging clouds. To ignore the clouds altogether is bad enough, but to complacently substitute home-made smudges is intolerable. The idea of a stock of clouds ready for use is as palpable an absurdity, from any rational point of view, as regarding the painted canvas and pasteboard accessories of a stage sky and landscape as real. The reason that we placidly accept the only too orthodox order of things, and fail to detect the lack of fit between the artificial sky printed in from one of such negatives and the earthly scene spread below it is that, looking so infrequently at the sky, we know next to nothing of clouds.

We rarely notice clouds except it be when turning a look towards them in the effort at deciding whether it would be wise to take an umbrella or not. It is natural perhaps. We are of the earth, very earthy, and clouds lack so markedly the personal human element we find so all-important in conferring piquancy and interest in life generally. A landscape much nearer to us, and interesting in proportion, will soon pall if deficient in the same element or its suggestion. The chimneys of the hall rising in the distance beyond the trees in the park add immensely to the value of the picture, the distant figure walking along it to the interest of a road. If we could expect a man to step out from behind an outlying spur of a mountain of cloud and start climbing it, or take the long, clearly defined cloud road stretching away to the west, we would be ready enough to turn our eyes upwards. A balloon occasionally entering into or emerging from a mass of cloud would have the same effect. Even when the rare reference is made to clouds, as often as not it will be a comparison of their shapes with such human products as towers, castles, and city walls. The painted clouds around the setting sun we certainly do look at and enjoy, but it is the enjoyment of colour more than their shape and form. We always have clouds with us, and plenty of them—as carriers of rain too plentifully oftentimes. It is a case of "nothing pay, nothing value." How grateful, on the other hand, to a dweller under cloudless skies must be occasional clouds, not merely in their coolness and suggestion of desired rain, but as relief to the soul from the ever blue and brilliant heavens above. Still, spite of their normal presence and the absence of a human touch about them, they are well worth studying, if only as giving so much added value to a picture. They are worth photographing, and photographing truly, dovetailed in to make a perfect and symmetrical whole. It is so easy to do too. A tilt of the camera and a duly shortened exposure upon an extra plate will give the exact sky we ought to have for the particular picture, and, if we can rise to admitting that clouds, cloud lights, and cloud shadows as arranged by nature are correct, it would be well worth while comparing a picture with its true sky with the same in which the most suitable sky from the stock of cloud negatives has been printed in. The difference to a right-thinking mind should settle the question and correct practice at once.

Outside of clouds and their effects, it would be rather hard to find much readily and strikingly photographable in April. The month is fuller in faint, but pleasing promise than anything else; and where here and there, as in the wealth of fruit blossom, that promise rises to a higher and more distinct note, the camera is not the instrument to catch and preserve it. The lovely pink and white of apple blossom is for the painter, and not the photographer. The angler can, perhaps, be caught, for this is his first—rational—month of going abroad; and in certain favourable positions he is worth catching. But the absence of foliage again in the setting of the picture detracts sadly from its value, and, if he can be taken to greater advantage from this point of view, later on it would be wiser to let him bide a while, for he makes no typical figure in April. It is too early, too, for picnicing parties and their pictorial possibilities, the weather being as yet too cold and variable for any lengthened rambling. Indoors we cannot stay with so much, if fugitive, brightness outside. Besides, April indoors is the month of spring cleaning, emphatically a non-artistic, non-photographable, and non-everything else, that means comfort and pleasure, process. The short walk in the invigorating and mind-quickenings freshness, which is a very marked quality in the month, may have a high

kind of negative value in pointing out the natural limits of photographic work. There are so many things we would like to take and cannot, that a fitting respect for the higher domain of the artist and painter is gained, for by a telling and suggestive seasonal touch they can convey budding nature and renewed life. This will prove in its fuller development a solid item of education, and contribute much to added pleasure, if only in looking over, and analysing, the wealth of illustration presented so lavishly nowadays in periodicals and magazines. It might ultimately even rise to so judicious a selection of suitable material for working upon as would compel the approbation and valuable help of the artists, that as a class we have hitherto been at war with, and rob the writings of a Pennell of the edge of their bite.

THE CONVENTION AND NEWCASTLE.

The Convention, for the first time in its history, has chosen the recognised northern metropolis for its temporary place of meeting; that they (the Conventioners) are to be congratulated upon their choice goes without saying.

Though not a native of Tyneside, I lived so many years in the "canny town" that I became inoculated with many of the ideas and idiosyncrasies of the inhabitants thereabouts, chief of which was the sentiment, indigenous to every native breast, that there's "nee pleye like Newcastle!" This sentiment is very real and very general, and takes hold of one very genuinely. You can imagine, therefore, the shock it is to me, when sometimes speaking of "Newcassel," some greenhead thinks I am referring to a trumpery place, which happens to be of the same name, in the Black Country!

Conventioners can take it from me, that from the point of view of the photographer (their view in fact) the sentiment above elaborated is particularly the case.

Newcastle (and district) has been from earliest days to the front in all matters pertaining to the art of photography. Where would the world be but for Mawson's collodion? What about the good old "Swan" plate of years gone by, and the many experiments conducted under the shadow, so to speak, of the old castle, which led up to the carbon process of to-day?

It was my good fortune, I think, to have come into contact with some of the old, and many of the new, men of the north, at a time when it was in the power of any town to distinguish itself by thorough, earnest, and enthusiastic work, in that newer photography which grew up with the introduction of the modern dry plate. Newcastle, as I knew it first turned out excellent work as times went, Mendelssohn, W. & D. Downing, P. M. Laws, and Ed. Sawyer, being the principal artists. My own ambition, after many years smouldering, was fired by actual association with the apparatus then in vogue. The outfit I bought was—for men were sitting on the fence at the time in such matters—a curious blend of the wet and dry, but with it I struggled on, and the main idea in men's minds being technique, persevered until the operations of taking and developing a negative were thoroughly mastered.

There was a restless spirit abroad, which impelled a small coterie of us to be continually at work in the various directions of plate-making, drop-shutter work, and the various printing processes, enlargements, copying, and the rest of it. At this time I became acquainted with the late Mr. Auty, whose earnest, thorough style of working did a great deal later on to foster in the northern amateur's brain a desire for excellence. Further on, when Secretary of the Newcastle Society, I made friends with the veteran, J. P. Gibson, the *doyen* of Northumbrian photographers; Thomas Galloway, the oldest northern photographer, still active and enthusiastic; the late Edgar Goold, whose fine and large wet-collodion work was at once the envy and admiration of his compatriots; Mr. P. M. Laws; Mr. W. Parry, whose reputation and name as a marine and engineering photographer has gone to the four corners of the earth; the younger Goold, who succeeded his father, and appears to have begun where his father left off, bringing to the work scientific and well-trained knowledge, and the skill of the intelligent draughtsman. Mr. W. D. Welford comes from coaly Tyne, and, although I cannot claim his acquaintance, everybody else knows him. E. G. Lee, younger, perhaps, than any of us, but a giant amongst medallists. Lyd Sawyer was a host in himself.

There was quite a band of enthusiasts, genuine hard workers, and the exhibition lists of a few years back testify to the power of the Novocastrian contingent to annex awards. Most of the lesser-known amateurs were just as keen; J. G. Sinclair's *Peep at Derwentwater* will be remembered. Mr. Bulmer, in a quiet way—far too quiet—turned out hundreds of fine picturesque bits of wonderful excellence; Mr. A. Campbell Swinton, then, as now, an earnest and up-to-date experimentalist. Mr. Galloway produced admirable photographs of the impressionist type, long before the days of the "Society Split," and the Salon. It would be easy to add to the list, which has, furthermore, been added to by newer men since my time; there is no reason to doubt that the old spirit is still alive and active.

To account for this enthusiasm in large measure was the prolific

picturesqueness and interest of the country as regards the ancient and mediæval. The antiquarians were strong, and very much to the front, and some four members were also members of the Antiquarian Society, while one of our amateurs had, in quiet excursions and pilgrimages along the line of the "wall," and so on, accumulated hundreds, literally hundreds, of little quarter-plate views of local scenery, architectural bits of old and modern interest, enough to make a "lantern-slide man" green with envy.

It is this characteristic scenery of which I should like to say a word. The Newcastle native looks round on his city and his country with a good deal of pride, satisfaction, and contentment; he knows there is no better place, for business or pleasure, in the country or out of it. I know the feeling well, but it is very possible for a first visitor to be disappointed or disillusioned; or, at the least, fail to work up any special pleasure over the "High Level," or the Cathedral, or even the magnificent thoroughfares. When the late genial editor of this JOURNAL was there in 1887, I did my best to show off the features of the old city in which we took most pride, but I rather fancy he enjoyed a stroll through "Jesmond Dene" most of all. The local committee may be trusted to make the best arrangements possible for visitors in the way of excursions; my experience is, however, that these somewhat cut-and-dried functions are rarely adapted to serious photography; others prefer to go "on their own," as the saying goes, and there are a few who stay over the official limit of days. To such, let me say, that at Alnwick one finds oneself in the very heart of the county's history, the grand old castle, the quaint township, the quiet picturesque river, the drive further on (by permission) to the ruins of Alnwick and Hulne Abbeys—such a day is to be remembered. In order to see the beauties of the Upper Tyne, nothing could be better than a run over to Chollerford, some six miles beyond Hexham; here a day could be put in, in order to inspect the very interesting relics of the Roman occupation in Britain; thanks to the owner of "The Chesters," close by Chollerford, we see here, in the Park that is, and occupying some five acres, the remains of one of the largest of the Roman stations on the line of the Wall. Returning over the bridge, we can stroll up the river-side towards Hexham, and get a variety of subjects. I believe I ran great risks as a trespasser when I went there, but I landed safely with a full bag.

It would be a pity to miss the trip down the Tyne, and, landing at Jarrow, the old church of the Venerable Bede, with its Saxon tower, and, in the chancel, what is said to be Bede's chair—don't be sceptical about this, but take it on trust, for what is life without imagination? On the other side of the river we can see Shields—

"A mass of houses—not a town,
On heaps of cinders squatted down
Close to the river's oozy edge,"

as the poet says—*dirty* but picturesque. If visiting Durham, stand a few moments by Bede's tomb in the lady chapel of the Cathedral, and, if it can be managed, by all means go to Chester-le-Street, *en route*, and mainly to Finchale Abbey—ruins certainly, but not so ruinous, and full of marvellous beauty and charm. Then we may mention Hexham, Rothbury, Bamburgh (famous for its castle, and reminiscent of Grace Darling), Bellingham, and Hareshaw Linn, Warkworth, "of less historic fame than Alnwick, but in itself a more pleasing object of study," says Mr. Freeman; this is a matter of opinion, but there is no question that the place is worth visiting. In short, leaving scores of other routes and districts unnamed, is there not some reason in the belief of the Northumbrian that his is a canny town and county?

J. PIKE.

THE METRIC SYSTEM.

In the course of a paper lately read to the Society of Chemical Industry, and printed in its *Journal*, Dr. W. S. Squire discusses some objections recently urged to the metric system, and points out that there are many curious coincidences which have been urged in defence of the British weights and measures and as an argument against the metric system, but, with one exception, they are mere rough approximations; and even this exception, like the rest of them, was not the result of design, but of mere accident. Sixteen years ago, says Dr. Squire, Sir F. Bramwell called attention to some of them. For example, a sheet of water one inch thick and of the extent of one acre weighs 100 tons approximately (really 101 tons). A piece of boiler plate, one inch thick and a foot square, weighs 40 lbs. approximately. Steel weighs rather more, and cast iron less. Again, a bar of iron one foot long and five-eighths of an inch in diameter weighs one pound, approximately (really a little more). I myself might add several others, and I will mention first the most remarkable of all, viz., that a cubic foot of water weighs 1000 ounces, this time exactly; but this, curious as it is, was quite undesigned. Then, again, a cubic inch of water weighs nearly 250 grains (really 252·458), a square foot of lead one inch thick weighs 60 lbs. very nearly, as the result of the specific gravity of lead being very nearly fifty per cent. more than that of wrought iron. Again, a pipe or vessel ten inches in diameter and a yard long holds 10 gallons (really 10·2).

If we turn to money (with which, however, we are not concerned to-night), we find that eight guineas per cwt. is eighteen pence per lb. This, like the cubic foot of water, is exact. I may also call your attention to

the other coincidences of this character, which, however, cannot be put to the credit of British weights and measures, as they are in the domain of geometry. The area of a circle is four-fifths of a square of its diameter (really a little less), and the contents of a sphere is half that of a cube of the same diameter (really a little more). Of course, this is only an approximation, but it is quite near enough for people who rely on these purely accidental coincidences for their calculations. It would be strange, indeed if a few coincidences did not occur here and there among the multiplicity of objects and dimensions which have to be dealt with in life, but that any one should seriously rely on them as a basis for calculation is stranger still. They do very well as "Bauer-egeln," and are fit only for rule-of-thumbists.

It can scarcely have occurred to those persons who have preached the cult of coincidence as a basis for happy-go-lucky calculations, and are using it as an argument against the introduction of the metric system, that they have thereby provided the very strongest argument for its adoption.

If a system of weights and measures is good in direct proportion to the number of coincidences to which it gives rise, what about the metric system? It teems with coincidences. It consists of coincidences and nothing else. It was intended to be so. A cubic decimetre of water measures a litre, and weighs a kilogramme. A square metre of water, one millimetre thick, measures a litre, and weighs a kilogramme. If we wish to know the weight of a sheet of anything one metre square and one millimetre thick, its weight in kilogrammes is expressed by its specific gravity, &c. All this is exact; there is here no question of approximation. How does the five-eighths of an inch bar of iron compare with this? The nearest approach is afforded by the British gallon of water, which weighs 10 lbs.; but then comes in that terrible 277·274 cubic inches as its cubic capacity. I need not enlarge on the beauties of the metric system, which coincides everywhere with mathematical precision. I have said enough to show that the argument of coincidences is a very sharp two-edged sword to play with.

Sir F. Bramwell's letter to the *Times*, last March, was followed by other objections and suggestions. Most of the letters were written by people whose knowledge of the subject was evidently most limited. One objection—it is an old one, but it was pressed home—is that the whole metric system collapses because it has since been discovered that the measurement of the quadrant was inaccurate, and consequently the metre is not the 10,000,000th part of the meridian after all. Perhaps it is, more probably it is not. It does not matter in the least. The length of the metre is established once for all, whatever the length of the meridian may be. Look at the standard chosen for the British weights—an old brass weight, which had been in the office of the Clerk of the House of Commons for 70 years. What a standard! If you clean it, it loses weight; if you do not, it gains weight, especially in such an atmosphere as that of London. I think I hear some one say, "Oh, but there are now a platinum pound and a platinum yard, and those are the standards." Very well, and we on our side have a platinum kilogramme and a platinum metre, with an exact copy in every capital in Europe. Those are our standards, quadrant or no quadrant.

Sir F. Bramwell, in his letter to the *Times* last year, contended that the kilogramme is inconvenient, as being too large a unit. He said that one frequently sees, in Paris and elsewhere, the price of certain articles marked up as so much per half kilogramme. This is perfectly true, and the remark applies chiefly to chocolate and confectionery. Tobacco here is bought by the half pound or less, never more. By parity of reasoning, the pound is too large as a unit. In fact, it is impossible to contrive a weight which shall be equally suitable for all purposes. The kilogramme may be, probably is, too large *quâ* confectionery, but it is certainly too small *quâ* coals, and many other articles.

In the same letter Sir Frederick objects to the use of decimals for any purpose whatever, he greatly prefers vulgar fractions. Though he does not say so, I presume he also objects to logarithms. He says he has frequently noticed that when buying tickets at a railway station the French ticket clerk will figure the sum out on paper, while the Englishman calls out the amount at once. That may be so in some isolated cases, but it is essential to know what calculation each clerk has to deal with; the one may be very obvious, the other much more complex. On many of the French railways the tickets are sold by women well advanced in life, and elderly ladies are not usually lightning calculators. My own experience is quite otherwise. For many years past I have been accustomed to make my calculations in this way: if the problem is presented in British measures, I get a clerk to convert them into the metric equivalents; and then, and only then, do I take the matter in hand myself. If great accuracy is not required, I use a slide rule, which I cannot do with British measures, except in a few isolated cases. Otherwise I figure it out. I get the result re-converted, and I find I save both time and figures, notwithstanding the two conversions.

Another instance of the extreme convenience of a decimal or centesimal notation is this: if we get a lot of facts and figures which we wish to compare, the first thing we do is to convert them into percentages. Until this is done it is impossible to understand them. When the metric system is used, the percentages come out automatically.

Sir Frederick, in his campaign against decimals, says that people are constantly misplacing the decimal point, and thus bring out absurd

results. If the result is absurd, a man goes over his calculation again; but it is not my experience that the decimal point is liable to be misplaced, the rule on the subject being so simple and plain. I am a bad hand at adding up a column of figures. I hardly ever bring out the same result twice running, but I do not think I ever misplaced the decimal point in my life.

The great objection urged by Sir Frederick and others who wrote to the *Times*, is the want of divisibility of the number ten. It can be divided by two and by five. Twelve, on the other hand, can be divided by two, three, four, and six. This may be to some extent an objection to the metric system, but it certainly is not an argument in favour of the British weights and measures, which do not run on twelve or on any common factor. To begin with: ten pounds go to a gallon, and ten chains to a furlong; three feet to a yard, five and a half yards to a perch, and so on. Lastly, $437\frac{1}{2}$ grains go to an ounce, and 277-274 cubic inches to a gallon. Sir Frederick avows a preference for duodecimals, and wonders why they are practically never used. The reason is, that if we had six fingers on each hand we should no doubt have had a duodecimal arithmetic, but, having only ten fingers, we count in decimals.

The most astonishing proposal was made by a correspondent of the *Times* in a letter which appeared soon after that of Sir F. Bramwell. He suggested that we should all go to school again, forget decimals and learn duodecimals; we should then start a new system of weights and measures copied from the metric system, but based on the number 12 instead of 10. All this because three and four will not divide ten.

In point of fact, the non-divisibility of the number ten by certain integers is a theoretical objection to the metric system so long as it works entirely in ten, but in practice it does not. A kilogramme is divided into 1000 grammes, and this is divided by two, four, five, eight, and ten. It is not divisible by three and six, for these numbers are in the nature of things as antagonistic to a decimal notation as five and ten are to a duodecimal one. The number seven does not fit into either. What is called the decimal system is, in fact, a milliary one, and, looked at in this light, it is quite as divisible as a duodecimal system. The metre, again, is divided into 100 centimetres, divisible by two, four, five, and ten, but it is also divided into 1000 mm., in which case the number eight must be added to the list of divisors. Nothing is perfect at first. It shakes down after a little experience is gained. Originally, the metric system was much more a question of decimals than it is now. Every time the standard, i.e., the metre, was divided by ten, it received a name derived from the Latin. Every time it was multiplied by ten it received a name derived from the Greek. The same holds good of the gramme, which is the standard of weight. Most of this has disappeared, and is to be found only in books of equivalent weights. No one speaks of decagrammes or of hectogrammes, and but very rarely of centigrammes or decigrammes. From the milligramme we go straight to the gramme as the next unit, smaller weights being expressed as 200 milligrammes or 300 milligrammes as the case may be. In the same way there is no unit between the gramme and the kilogramme, so that there are only three recognised units of weight, the factor being 1000.

In the same way the litre, the standard of fluid measure, is divided into 1000 cubic centimetres or fluid grammes. We have indeed got the hectolitre or 100 litres, because that is a very convenient measure, but here it stops, and any large quantity is expressed in hectolitres, just as in Britain the flow of the Thames, for instance, is expressed in gallons, for which purpose I may remark that the gallon unit is too small. Again, the metre is divided into 1000 mm. Those of you who have seen German or French engineering drawings will find the dimensions invariably expressed in millimetres, and beyond a metre in metres. To put in a complication of decimetres, centimetres, and millimetres would be to approach the British practice of, say, two feet seven inches and a bare $\frac{3}{2}$. Occasionally the centimetre is used, e.g., by dressmakers, but even they know nothing of decimetres. If we handle a polarising saccharimeter, we choose a tube of 100, 200, 300, or 400 mm. I contend that in the metric system, viewed as a milliary system, this objection of divisibility practically disappears. Viewed from another point of view, it disappears altogether. If the metre is looked upon as a measure of 1000 mm, we start from the smallest practical unit. No division is necessary. It may be necessary to multiply, but you can multiply by any figure you like if you cannot divide.

Would there be any practical difficulty about introducing the metric system into Great Britain? I think not. There are some curious relations between the metric weights and measures and those at present in use in this country, and here we come back again to a series of perfectly undesigned coincidences.

The metre is ten per cent. more than the yard, the kilogramme is equal to 10 per cent. more than 2 lb. Fifty kilogrammes are equal to one cwt. within $1\frac{1}{2}$ per cent. One thousand kilogrammes are equal to one ton, also within $1\frac{1}{2}$ per cent. The litre is equal to a quart less 10 per cent. The hectolitre is equal to 20 gallons, plus 10 per cent., or 22 gallons. The hectare or French acre is $2\frac{1}{2}$ English acres. One hundred mm. are equal to four inches; the kilometre is two-thirds of an English mile, or, say, two miles equal three kilometres; so that these coincidences, none of them quite exact but very nearly approximate, would serve as a guide until people were accustomed to the new measures. As a matter of fact, metric measures are already in use officially. The kilowatt, which is the Board

of Trade unit for electrical measurement, is founded on the centimetre, gramme, second or centigrammes system, and has nothing whatever to do with the Imperial legal measures.

The limit of weight of the Parcel Post is 11 lbs. Why is the number 11 chosen? Certainly not on account of its easy divisibility, for nothing will divide it; but 11 lbs. happen to be five kilogrammes, and, what is more, it is intended to be 5 kilogrammes.

The limit of weight for the minimum of foreign postage is really 15 grammes, and we have adopted one-half of an ounce as a rough approximation; so that we have already made a start, though only a small one.

I have not alluded to the subject of a decimal coinage, because it is a very much less important thing. The kilogramme is a kilogramme wherever you take it, and a metre is a metre, and a litre is a litre in all parts of the world; not so with money. This is complicated by the rate of exchange, which is constantly varying. Take, for example, the Latin Monetary Convention. Italy and Spain decided to adopt the French monetary system. The Italian lira and the Spanish peseta were made equal to the French franc, and the coins contain the same amount of metal, so that one would expect that the rate of exchange between these countries would never vary.

About two years ago I was in all three countries. In France I got 25 francs for my sovereign; in Italy, 27 lire; and, in Spain, 37 pesetas. In Greece there is a gold coinage equal to 20 francs, but you never see a gold coin in Athens; they are all in Paris, where they pass current as 20 francs. In America the Mexican dollar, which contains rather more silver than the American dollar, is worth only half as much as the American dollar. The United States stamp has doubled the value of the metal. Even the exchange between the two strongest financial centres, London and Paris, is constantly varying.

An international system of weights and measures is a perfectly practicable thing, while an international monetary system is a Utopian dream.

EXPOSURE AND DEVELOPMENT.

I.

[Paper read before the Chiswick Camera Club.]

THE operations of exposure and development are so intimately associated with, and dependent on, the nature of some of the materials employed, that a part of the time at our disposal may be profitably devoted to a brief consideration of a few of their characteristics. It may, I think, be conceded that the plates we propose to use should have our first attention.

In a general way, these may be placed in two classes, viz., those incorrect for rendering colours, and those specially sensitised to give a more perfect representation of various colours in monochrome. It will be found that the former, varying from slow to extremely rapid, will require for each grade a somewhat different treatment throughout, depending principally on the quality of rapidity possessed by the sensitive coating. Orthochromatic plates, on the other hand, are made with a somewhat less varied range of rapidity; yet those which are sensitised for the correct rendering of a considerable portion of the spectrum are so sensitive and require such careful manipulation that they may be considered as having no value whatever in the hands of the beginner.

Adverting now to the uncorrected or ordinary plates, it is well known that, in the hands of the photographer accustomed to slow plates, the tendency of an extremely rapid plate is to give a somewhat thin negative, having a small range of gradation compared with a slow one, under what might be considered correct exposure and normal development in both cases. This is said to be in a great measure due to the thinness of the coating of emulsion, which reaches a state of great fluidity in the process of preparation to give extreme sensitiveness, and with which it is consequently difficult to give the plate a thick coating. Conversely, the slow plate, which tends rather to greater contrast under suitable conditions, will generally be found to have a much thicker film than the rapid one.

To those who elect to work with very rapid plates a number of difficulties present themselves, due principally to their rapidity or extreme sensitiveness. The difficulty of obtaining vigour or contrast has already been alluded to; another is that much greater care must be exercised in all operations, from the time of opening the packet of plates up to the fixing of the negative, in order to avoid fogging from unsafe light. With some brands of rapid plates there is also a liability to chemical fog, or veil, under certain conditions of development, and, finally, there is what is known as less latitude in exposure with the rapid than with the slow plate. This latter quality, however, appears to be somewhat misunderstood, and is often taken to mean that a rapid plate, having received a moderate over or under-exposure, is less amenable to treatment during development than a slow plate that has received an equally incorrect exposure. If any experiments have been made proving this to be a fact, they were not accessible for the purposes of this lecture. Abney, however, states (*Photography*, November 24, 1899) that "latitude of exposure is more wanting in it than with a slow plate. It will not bear five or six times the correct exposure, for it is apt to begin to show reversal, and then the high lights become feeble and bad." So far as general experience in the use of rapid plates goes, the difficulty seems rather to

have been in measuring accurately the very short exposures sometimes given.

Let me explain by an example: Suppose that you have to make an exposure with a rapid plate, and that by some means you have discovered that half a second would be correct; also that you intend exposing a slow plate on the same subject, and for which two seconds would be correct time. Now, assuming the limit of error on the part of the operator to be a quarter of a second, it is obvious that in the case of the rapid plate, the possible error would amount to fifty per cent. over or under. In the case of the slow plate, however, the same error of a quarter of a second would only amount to twelve and a half per cent. of the intended exposure.

With regard to gradation, Capt. Abney says (*Photography*, vol. viii., p. 637) that "rapid plates have, as a rule, a longer and more correct scale of gradation than slow plates," a statement that, of course, assumes the possession of sufficient skill to manipulate the plates to the greatest advantage.

The foregoing has probably indicated that the choice of the beginner should fall upon plates of low, or medium speed, and that these should be used exclusively until all their capabilities are known. One of the most serious mistakes made by beginners is that of changing from one make of plate to another, with the vain hope of finding a plate capable of compensating for the operator's unskilful or careless manipulation. Undoubtedly a very large percentage of the failures made, not only by beginners but by fairly skilled photographers, may be traced to the constant search for that eternal will-o'-the-wisp, the perfect plate. It may be taken as an axiom, that the perfection of any brand of plate is measured by the photographer's familiarity with its good and bad qualities; the more thoroughly these are known, the more perfect will the plate appear and the less will be the desire to make a change. Probably every brand of dry plate obtainable has certain peculiarities and limitations, which must be carefully studied and mastered if the best results are desired. It will be wise also to undertake only those subjects which are within the reasonable capacity of the plate.

At this point may be profitably urged upon the beginner the necessity for the utmost care, and cleanliness, in all photographic operations; also for guarding against stray actinic light in the dark room as well as in the camera and plate-holders.

Many beginners are in doubt as to the best method of illuminating the dark room when developing plates, and are apt to think that it is best to use daylight wherever possible. If this course is adopted, it will be found practically impossible to produce negatives of uniform quality, owing to the great variation in the strength of the light at different times of the day and year and the consequent variations in the appearance of the negative during development.

A much better plan is to perform all developing operations, even in daytime, by the aid of a good artificial light, such as a gas-burner or a fairly large lamp that may be depended on to give a uniform flame for some hours without attention.

The quantity of light permissible in the dark room is also a source of much concern to the beginner. A plentiful supply of light, so conducive to comfort and good work, is not inconsistent with good work, the danger lies in the quality of the light. This should be tested by direct experiment before risking the development of negatives by its aid, whether it be daylight or artificial.

A simple test may be made as follows: put a plate in a dark slide, or plate-holder, in perfect darkness. Then light up the room as intended to be used for developing, and place the plate-holder in the same position that the developing dish would occupy. Draw the slide so as to expose one quarter of the plate for, say, five minutes, then open half way and expose a further five minutes, and finally give a third exposure of five minutes with the slide three-fourths open, leaving the remaining fourth part of the plate unexposed.

Having placed everything in readiness, turn out the light and develop the plate in darkness for five or six minutes, rinse in water, and place in a fixing bath before lighting up again.

The result will clearly indicate whether the light is safe; it need not be condemned if the veiling of the exposed plate is very faint, as, in ordinary working, the dish should always be kept covered during development, except during brief intervals when examining the negative.

When filling dark slides or plate-holders, the plates should be dusted by passing a suitable brush or pad slowly over the whole of the film. Your attention is directed to the word *slowly*, because it has been found, from experiment and experience, that a rapid brushing of the film is liable to set up what are supposed to be electrical conditions, with the result that particles of floating matter are immediately attracted, and firmly attach themselves thereto. The natural consequence is a plentiful crop of pinholes, and hair marks, on the negative.

It will be found a useful precaution, to pass the dusting brush along the edges of the plate, to remove all particles of glass adhering to them as a result of cutting operations, and which are only waiting to become accidentally dislodged to take their apparently natural place on the sensitive surface of the plates.

It is always advisable to fill the dark slides as short a time as convenient before using the plate.

There are at least two good reasons for this, the first is, that gelatine

plates will eagerly absorb moisture from the atmosphere, and that a comparatively brief contact will be sufficient to render them slower, or less sensitive, over the portions affected.

The second is, that, in spite of all precautions, the substances used in the manufacture of dark slides appear to be able, in course of time, to exert a more or less harmful influence on the sensitive coating of the plate. For the same reasons, any unused plate should, at the earliest opportunity, be transferred back to the makers' boxes if not wanted again for a week or two.

With these introductory remarks, we will proceed to consider the first of the operations properly pertaining to this lecture, viz., "Exposure."

In the first place, we shall try to fully understand what it is that we wish to accomplish when we expose a plate. If we want to include in our picture the full range of light and shade presented to us in the majority of subjects which we may consider suitable for the camera, we are confronted with the fact that the materials at our disposal, both for negative and printing purposes, are quite incapable of reproducing them.

Only those scenes, or subjects, in which the range of light and shade come within the scale of gradation obtainable in the photographic negative, can be considered susceptible of what is known as correct exposure.

To the vast number of subjects which range beyond the limits of our plates has been applied the time-honoured and little understood rule, "Expose for the shadows and let the high lights take care of themselves."

A too rigid adherence to this maxim, must inevitably lead us to frequently make exposures in which the highest lights in our subject will be very much over-exposed, and require the utmost care during the development of the plate to secure even an approximately correct rendering.

On the other hand, except for occasional pictorial purposes, it is not desirable to strive for exact exposure in the high lights, and leave a large portion of our negative entirely devoid of detail. Regarded in this light, the maxim above quoted is, doubtless, of value.

Our advice, then, would be to first practice upon subjects having a moderate range of light and shade, leaving the more difficult ones, in which over-exposure in the high lights becomes inevitable, until a thorough familiarity with both plate and developer has been acquired.

The scope for the beginner's skill having thus been somewhat narrowed, we may endeavour to explain the ways and means for obtaining correct exposures. There are quite a number of factors entering into the problem; but, as many of these concern only special cases, we shall deal with only three of the principal ones, viz., the speed or sensitiveness of the plate, the relative aperture of the lens, and the actinic value of the light illuminating the object to be photographed.

Of these the two former are subject to our own choice; that is to say, we can choose a rapid or a slow plate, and we can stop down the lens as desired.

The third factor may be determined either by measurement, by the use of tables of light values, or by the exercise of the personal judgment of the photographer. Obviously the latter method has no value to the beginner, who is without that prolonged experience which might give him an excuse for trusting to his own judgment. We shall probably be not far wrong if we say that blind guesswork in the matter of exposure can never conduce to reliable or satisfactory results any more than would the hap-hazard compounding of the solutions used for development. Exposures founded on experience, which may be dignified by the term *modified guesswork*, are still made by a very large number of undeniably capable photographers. Many of these depend almost entirely on the appearance of the image on the focussing screen as a guide to exposure.

Yet many of these old and successful photographers who scorn the help of tables or actinometers admit that they are useful to beginners since it took them many years to acquire the judgment on which they depend.

At the time when many of us began photography, the handy meters or light-measuring instruments now available did not exist, and in their absence those who desired to have some guide in making their exposures were glad to avail themselves of the late W. K. Burton's tables, showing the relative exposures necessary for various subjects at different times of the day and year. Later on, these tables became embodied in, or formed the basis of, exposure calculators by Mr. Dibdin and others. The Dibdin instrument is made of cardboard, and sold for the modest sum of sixpence. In these calculators, however, there is still a very important factor left to the decision of the operator, viz., whether the light at the moment is to be considered dull, gloomy, or bright, a decision which may at times baffle even a fairly trained judgment. There also remained a certain amount of calculation to be made when using a rapidity of plate other than that for which the instruments were made.

G. F. BLACKMORE.

A CHAT ON BALANCES.

At the meeting of the London and Provincial Photographic Association on March 29, Mr. A. Mackie passed round about thirty platinum prints from his series of British Museum subjects. In reply to severa

uestions, he stated that the negatives were on ordinary plates, unbacked, and pyro-ammonia developed. The exposure in every case was a matter of minutes, the shortest three minutes and the longest forty or more. Mr. A. Haddon gave what he styled a chat on

BALANCES.

The subject was suggested to him by the words of one of the members at a meeting not very long ago when speaking about the developer required in a certain colour process, namely, one grain of pyrogallol per ounce of water. The question was asked, How can this quantity be weighed? Hearing this, he was at once led to the conclusion that the balances used by photographers were, as a rule, incapable of weighing to a grain or less with any degree of accuracy, and he therefore thought that a chat on the principles upon which balances depend might be considered of some interest.

The mathematical balance, he said, might be taken as a beam of some rigid material having no weight, supported at its centre, and furnished with a means of attaching to its ends two pans at an equal distance from the fulcrum. In attempting to embody these principles and to produce the device in brass or other metal, certain difficulties arise. Firstly, our beam, however produced, is not absolutely rigid; secondly, it is not weightless; and, thirdly, the difficulties of supporting the beam and attaching the pans to the ends of the beam are very considerable. As a rule, the distances of the pans from the fulcrum are not strictly equal, as they should be. The weight of the substance of the beam creates a difficulty in that, if it is not supported truly at the centre of gravity, either above or below, the sensitiveness of the balance is affected. If the centre of gravity is above, then the beam will be in unstable equilibrium, for, as soon as it is displaced, the centre of gravity goes to one side, and the beam topples over. If the centre of gravity is below the point of suspension, then, as soon as the equilibrium is destroyed, the whole mass of the beam is carried to the opposite side, and a large weight is required in one of the pans to restore the equilibrium. The sensitiveness of a balance depends, therefore, a great deal upon the centre of gravity with respect to the point of suspension. The foregoing facts were clearly explained by diagrams upon the blackboard.

Another serious difficulty to be overcome is that due to flexure of the substance employed for the beam itself. This is overcome in part by the form given to the beam and by a system of struts, which also was figured on the board. By these means, whether a small load is placed in the pan or a tolerably heavy one, the sensitiveness of the balance is not affected by complications arising from flexure. As a rule, beams so constructed are provided with a screw movement, by which the centre of gravity can be adjusted with respect to the point of suspension.

In order to reduce friction at the points of suspension, both of the beam itself and the pans at its two ends, to a minimum, in the balance constructed nowadays and for some years past a knife edge is given to the beam at these points, which rest upon a truly plane surface. The wear and abrasion of the knife edges and plane surfaces is reduced to the lowest possible amount by employing agate for these parts, but great accuracy is required in the grinding of the bearings. Another factor which determines the value of the balance is the relationship of the three knife edges. They must be exactly in the same straight line, and the centre of gravity as near to that as it is possible to make it. Then the question of a pointer or indicator comes in. With an accurate balance one would not determine the weight of a thing by trying to find the point of equilibrium, but by displacing the balance from its normal or zero point, and reading an equal number of oscillations on the divided scale by means of a pointer.

By observing these several points a tolerably accurate balance should be produced. Laboratory balances, in principle, conform to them, and very good instruments are made by Messrs. Oertling, of London. Balances, better in some respects than these, are made elsewhere, with a shorter beam and perhaps more sensitiveness, and some have an additional movement whereby the relative positions of fulcrum and pan supports may be adjusted. As a rule, however, in well-made balances the error does not exceed 5 in 100,000, and when that is the case it is immaterial which pan is used for the weight and which for the substance to be weighed.

Delicate balances, such as those under discussion, are always kept under cover in a glass case, to obviate draughts, which, however slight, would upset equilibrium and render it impossible to weigh with exactitude. Ordinary balances such as photographers are in the habit of using have very little sensitiveness. Mr. Haddon had an example, bought some twenty years ago, which would only just show the slightest movement with a one grain weight. In the same category was the majority of the balances used by photographers. One grain was not a large amount, but photographers should all have it in their power to weigh one grain with exactitude. As previously mentioned, with some balances it is a matter of importance that the weights are always placed in a certain pan owing to inaccuracies in construction. With a weight known to be accurate, however, used with a balance the beam of which is known or suspected to be out, a very close approximation to the accurate weight of a substance can be made. The substance to be weighed is placed first in one pan (called A) and its weight determined in B. Weight and substance are

then changed about and the weight again determined. The true weight would be equal to the square root of the product of the two weights. A less exact determination would be the mean between the two figures.

The weights themselves, however, are not what they might or should be. Mr. Haddon had measured some of the weights supplied with balances, and ascertained that a weight of ostensibly two drachms measured 120·83 grains—more than three-quarters of a grain out. The percentage was small, he admitted. The same proportion of error was found with a one-drachm weight, which was ascertained to be 60·42 grains. Below are given the true values of other weights tested by Mr. Haddon:—

Weight as marked.	Actual weight.
40 grains ...	40 $\frac{1}{3}$ grains.
30 "	30 $\frac{1}{10}$ "
20 "	20 $\frac{1}{10}$ "
10 "	10 $\frac{1}{100}$ "
6 "	6 $\frac{1}{100}$ "
3 "	3 $\frac{1}{3}$ "
2 "	1 $\frac{1}{7}$ grain.
1 grain ...	1 $\frac{1}{5}$ "

Perusal of this table shows that, where (as in the smallest weights) greatest accuracy is wanted, a greater percentage of error is found. Of course, if our balance and weights cost only 2s. 6d. or 3s. 6d., the want of accuracy is not to be wondered at; but, at the same time, increase of price generally affected the quality of the balance, and the weights remained very much as given above. Photographers should look round, therefore, and see that they get decent balances and decent weights.

The question of weighing one grain of pyro is not a very serious one, it is true. If our weights and balances are not strictly accurate, we can, as somebody suggested, dissolve ten grains in ten ounces of water, using an ounce, which would then contain a grain, and throwing away the nine ounces. But this practice with such a dye as is recommended for the Lippmann process—quinoline red, costing one shilling per grain—would be out of the question. It would pay to purchase, under these circumstances, a more expensive balance, provided that the extra labour necessary to make it a perfect instrument had been expended on it.

Four or five years ago Mr. Haddon saw a toy which involved a principle which he had embodied in a better form in the construction of a most sensitive balance at little or no cost. One could weigh with accuracy one-fortieth of a grain, and anybody who could solder together a few pieces of wire was able to construct one of the same accuracy. Instead of two pans, one each side of the fulcrum, this balance had one only, being devised on the counterpoise principle. Briefly, it consisted of a standard, from which was suspended, on loops of silk fibre, a beam of very light construction, carrying at one end two mica pans one above the other. At the other end was an adjustable screw counterpoise. As erected on the table, it was counterpoised very nearly with a weight of ten grains in the lower pan. A long aluminium pointer working on the face of a divided scale is used for reading. A piece of aluminium wire, which was very nearly one grain (perhaps a few thousandths out), was then dropped into the upper pan, the pointer as the result being deflected to a considerable extent. Using now a weight of one-tenth of a grain, a movement of five divisions was noticeable on the index, so that one-fiftieth of a grain would be easily weighed, and a deflection of one degree would register this amount. Of course, to use such an apparatus at its best, there should be a cover over the balance.

In order to weigh two grains of anything with this balance, the ten grains weight would be replaced by eight grains, material being added to the upper pan until the equilibrium was restored. By having an adjustable counterpoise, weights of any magnitude within the strength of the apparatus can be measured. A hastily but very lightly constructed model on similar principles was also shown and found to register to one one-hundredth of a grain. The first would equal this feat under cover. The apparatus was examined with a deal of interest, and a vote of thanks was passed to Mr. Haddon for his remarks.

A HALF HOUR'S TALK ON PHOTOGRAPHY.

An attempt to condense within a half-hour's talk the whole science and practice of photography is one that would probably "stagger" the average "humanity" of the most skilled enthusiast. But Mr. F. O. Bynoe boldly essayed to accomplish the impossible the other evening at the Thornton Heath Polytechnic, and the satisfaction of his audience demonstrated that his happy methods of rapid explanation were eminently successful in transmitting a fund of information which was interesting and instructive both to the novice and the experienced worker. It must be admitted, however, that his talk extended somewhat beyond his time limit, for, when this was reached, his hearers demanded more, thus manifesting their appreciation of what they had already listened to.

Mr. Bynoe gave a rapid but most lucid sketch of the different varieties of lenses, and their special uses. The single lens, the R.R., the portrait, and the tele-photo, were all described and illustrated by specimens. Astigmatism and its difficulties were briefly referred to.

The "talker" then briefly alluded to the various processes at present in vogue for the production of pictures. The silver print, the gelatino-chloride, the platinotype, the bromide, the velox, the gravure, the carbon, and the gum-bichromate processes, were handled tersely but with sufficient reference to their chemical and manipulative details to convey an intelligent apprehension of them all. Each was exemplified by specimen prints, some fine carbons lent by the Autotype Company being much admired. The clear though necessarily sketchy demonstrations of the principles which formed the basis of each process convinced us that Mr. Bynoe knew what he was talking about, and that his knowledge was founded on actual and practical experience.

The defects of dark rooms were touched upon, and, by the help of a spectroscope, safety from the intrusion of the green or violet rays, which so rapidly fog our plates, was shown to be within reach of every operator.

Exposure was next dealt with, and the latitude afforded by reliable plates or films was demonstrated by negatives and prints of a subject which had been produced under the same conditions by exposures varying from one-fifth to one-eightieth of a second. It was remarked that each of these results, considered by itself, was fairly acceptable, although the correct exposures were clearly evident when the intermediate ones were carefully examined.

From this point Mr. Bynoe proceeded to remark upon portraiture as being the most tempting pitfall into which amateurs generally slipped. He spoke of the importance of effective lighting, and the avoidance of strong shadows thereby, showing that, by certain simple arrangements, pleasing as well as truthful portraits could be secured in the majority of cases.

A list of books relating to photography to be found in the local library was then given, and the speaker also made some suggestion as to other books, the study of which would be serviceable to all who desired to excel in that fascinating hobby. This brought the talk to a close, and it must be admitted that Mr. Bynoe managed to crowd into the short interval at his disposal an immense amount of instruction, which it is barely possible to glance at in the present brief report.

On the motion of Mr. G. Edwards, seconded by Mr. Rogers, a unanimous vote of thanks was awarded to Mr. Bynoe for his address.

the competing photographs can be accepted, although every care will be taken to return safely any unsuccessful photographs if stamps for this purpose are enclosed.

It is understood that all reproduction rights of the successful photographs will pass to the proprietors of *Country Life*, and, if required, the negatives of these pictures will be given up to them. The proprietors also reserve to themselves the right to make use of any of the unsuccessful photographs upon payment of from 5s. to 10s. 6d. for each picture published, according to their idea of merit.

The competition will close on June 21, and the decision of the Editor, which will be final and without appeal, will be announced as early as possible after this date.

SOME PHOTOGRAPHIC ODDS AND ENDS.

ON March 27 Mr. C. S. Baynton read a paper before the members of the Birmingham Photographic Society, the subjects touched upon being the dark room, and dark-room lights, and the making of lantern slides.

The dark room, Mr. Baynton thought, was a greatly neglected part of the photographic equipment, and the apartment which was dignified by the name of dark room was not in many cases conducive to successful results.

The three essential requirements were : 1. Cleanliness; 2. Plenty of room in which to work; 3. Plenty of light of the proper kind. Cleanliness could be secured, to a great extent, by covering the floor with oilcloth, which materially lessened the number of dust particles floating about in the air.

Coming to the most important question of dark-room illumination, the lecturer said that a great number of photographers blamed the plate-makers for defective plates, when, in many cases, the fault lay in the use of an unsafe light. The effect of this was to cause lack of brilliance and often general fog all over the plate. The remedy was obvious; but, while the light should be safe, it need not be of that kind such as mostly led to the spilling of developer and the use of language usually reserved for the dark room. As a result of many trials, Mr. Baynton had come to the conclusion that a light filtered through yellow paper and orange fabric was quite safe, except, of course, for isochromatic plates. The new material known as glacier also gave very satisfactory results. A general principle might be laid down that, if one could see the illuminant through the filter, the light was unsafe, and should be rejected.

The second part of the paper dealt with the making of lantern slides. Mr. Baynton urged the importance of correct exposure, as any error could not be rectified in the subsequent development. To prevent the accumulation of a stock of cover glasses, it was advisable to make some trials by giving different exposures to portions of the same plate and comparing the developed result. Development should be continued till the prettiness has gone off the slide when looked at as it lies in the dish, and, in order to judge density, a yellow light was much to be preferred. Care should be taken always to maintain the solution at a uniform temperature, and a golden rule was always to use one brand of plates, to start with slow ones, and to stick to one developer.

Many workers are probably unaware that lantern plates are subject to halation as much as negatives, and all plates should therefore be backed to prevent this. Fixing should be carried out in an alkaline solution, as less colour would then be lost when warm tones were desired.

Finally, let not any one think that the slide was complete when fixed and dry. A finishing touch yet remained, which might make or mar the whole, to wit, the mounting of the slide. How often did we see slides which might otherwise be things of beauty and a joy for ever spoilt by inattention to this simple detail. The maxim, "Spare the knife and spoil the picture," applied equally to lantern slides as to pictures on paper.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

In view of some remarks recently made in our pages relative to the above Association, it may be of interest if we print the rules. They are as follows :—

1. That the Association be called The National Photographic Record Association.

2. That the aim of the Association shall be to obtain photographic records of all objects and scenes of interest in the British Isles, and to deposit them, with explanatory notes, in the British Museum, where they may be safely stored, and be accessible to the public under proper regulations.

3. That the constitution of the Association shall be as follows : Patron, Vice-Patrons, President, Vice-Presidents, and other officers and members.

a. Vice-Presidents, who shall be elected annually; the qualification shall be a subscription of one guinea per annum.

b. Members, who shall be representatives of photographic, scientific, archaeological, literary, artistic, or any other learned societies, not exceeding three for any one society, upon payment by the respective societies of an annual subscription of one guinea.

c. Members, whose qualification shall be (1) a contribution of photographs to the number of six approved prints for the year; or (2) a

ANNUAL DINNER OF THE PLATE-MAKERS' ASSOCIATION.

WE are informed that the Third Annual Dinner of the Plate and Paper-makers' Association will be held on Wednesday evening, May 2, at the Restaurant Frascati, Oxford-street, London, W. Hitherto none but members have attended this annual dinner, but on this occasion it is hoped that dealers and members of the trade will avail themselves of the opportunity of being present in order to show their approval of the objects of the Association. The dinner will be held in the week when many country dealers, &c., may be on a visit to London. Tickets for the dinner, price one guinea, including wine, may be obtained from the Secretary of the Association, W. J. Eales, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

COUNTRY LIFE PHOTOGRAPHIC COMPETITIONS.

OUR admirable contemporary, *Country Life*, which is published at 20, Tavistock-street, Covent Garden, W.C., announces that, on account of the great success that attended its recent photographic competition and the interest it created amongst a large number of the readers of *Country Life*, many of whom sent photographs of high artistic merit, it has been decided, in order to further encourage the art, which is so eminently suited to lovers of country life, to begin another competition for photographs of spring subjects. The beautiful effects to be obtained in the garden at this season of the year are varied, and, although the following short list by no means covers the whole ground, it will suggest the class of subject that may be worthy of the attention of intending competitors :—

Spring Flowers.—Particularly the artistic effects obtained by growing narcissi, scillas, tulips, and other flowers in meadow grass, or beneath trees, by man and by nature.

Spring Flowers on the Rock Garden.—To show effects, not merely of many kinds, but of individual flowers in pretty aspects.

Spring Flowers in the Border, or massed upon the lawn or in beds.

Spring Flowers in the Shrubbery.

For the best set of not less than twelve photographs a prize of 5*l.* will be awarded.

The photographs should be silver prints—preferably on printing-out paper—not smaller than half-plate size, and should be carefully packed, and addressed to the Editor in a parcel bearing the words "Photographic Competition" on the outside. For the purpose of identification, each individual photograph must be clearly marked with the name and address of the competitor, but no responsibility for the safe keeping of

subscription of not less than ten shillings per annum. Members may at any time compound for their future annual subscriptions by the payment of five guineas.

d. Members who shall be honorary, county, or district secretaries, whose appointment shall be made by the Council and confirmed at each annual meeting, and whose duty it shall be to collect photographs in their respective localities.

4. The business of the Association shall be transacted by a Council consisting of the President, Secretary, Treasurer, Curator, and twenty members, all of whom shall retire annually and be eligible for re-election. The Council shall be elected at the Annual Meeting, and all members of the Association shall be entitled to vote and shall be qualified for nomination.

5. All photographs sent in shall be submitted to the Council, with whom shall rest the power of approval.

6. The Curator shall keep an account of the collections of the Association, including particulars of photographs received from time to time, which he shall give a receipt on behalf of the Association to the respective donors. He shall also prepare a list of photographs received during the year, with the names of the donors, for the purpose of being printed and circulated.

7. The Annual Meeting shall be held in the month of February.

8. The Ordinary Meeting of the Council shall be held in February, April, June, October, and December.

9. Voting at all meetings shall be by show of hands, the Chairman for time being having the right of a casting vote in the event of votes being equal.

10. At the Annual Meeting seven, and at the Ordinary Meetings of Council three, shall form a quorum.

11. Subscriptions shall be due on January 1 in each year.

12. The Council shall have power to fill up any vacancy in their own body occurring in the interval between Annual Meetings, and to make by-laws; such by-laws to have the sanction of a General Meeting before coming into operation.

13. These rules shall only be altered at an Annual Meeting or at a special General Meeting called for the purpose. Notice of proposed alterations shall be given in writing to the Secretary one calendar month before the date of such meeting.

BY-LAWS.

1. Photographs must be printed in carbon, platinum, or other permanent process, and be deposited unmounted with the Curator, who shall have them uniformly mounted upon official mounts provided for the purpose.

2. For the sake of uniformity, whole-plate ($8\frac{1}{2} \times 6\frac{1}{2}$) shall be regarded as the standard size for photographs. Two or more prints of a smaller size may be placed on one mount. Photographic enlargements beyond whole-plate size are not recommended.

In all cases it is desirable in taking pictures that a relative scale of size should be indicated. Thus a man or child might appear in an orchard, or near a boulder stone, or a measured rule might be introduced where more scientific accuracy is desirable, and for the purpose of recording the orientation of the building or subject photographed it is desirable that the point of the compass towards which the lens of the camera points when the photograph is taken should be notified.

THE CAMERA CLUB.

The past month has seen no startling development in the world of photography, and therefore the Camera Club, in common with other photographic societies, has had a restful time; but, as it is customary to place upon the programme a lecture, or demonstration of some kind other than every Thursday evening, the energetic Honorary Secretary has performed his onerous duty by inviting discourses on varied subjects. Travels and wanderings in far-off lands, described by the travellers or wanderers themselves, are always interesting, especially if they be illustrated, as they generally are, by original lantern slides; indeed, the lantern slides are often the excuse for bringing the subject before a photographic club, if excuse be needed by an assemblage which is always glad to welcome in their midst any one who has an interesting story to unfold.

On one of these March evenings a highly respected member of the Club essayed to take the lecturer's place and thus perform a promise made some months previously. This was Mr. Webber, who on a former occasion, when in the course of a paper on soldering the lecturer produced a blowpipe, volunteered to melt a halfpenny in a few seconds against any one in the room. On that occasion he made good his boast, and the halfpenny was reduced to an amorphous condition. From that little experiment grew the notion that Mr. Webber, with his long experience as a practical goldsmith, an experience stretching over considerably more than half a century, might be persuaded to show to the Club on some future occasion some of the mysteries of his craft. Truly he was not a photographic subject with which Mr. Webber now, in confirmation of his promise, brought before the Club, but there was a saving clause in that it had to deal with the noble metals—argentum

et aurum—metals without the salts of which photography, as we know it to-day, would have been impossible.

It is true that photographers have little to do with the precious metals themselves, but Mr. Webber reminded them that they might sometimes get a closer acquaintance with pure yellow gold if they would only be more careful to save the remains of an exhausted toning bath, instead of letting it run down the sink. He, it is true, is only an amateur photographer using gold for toning in very modest quantities, and yet he was able to show a long ribbon of the shining metal which he had recovered from waste solutions. Still more interesting and useful was the information which he had gleaned from careful notes of the amount of gold chloride purchased compared with the metal recovered. He said that he proved that it was possible to get back in this way no less than seventy per cent. of the gold purchased for use in photography. This is a matter which should be noted by professional photographers in a small way of business, who too often totally neglect this source of economy, although in large establishments it is, of course, well looked after.

There were other little bits of information concerning the precious metals which Mr. Webber vouchsafed to his hearers which could not be readily gleaned from the usual sources. For example, although silver has become cheaper and cheaper until a half crown is hardly worth a shilling intrinsically, gold has, in spite of Klondike and in spite of the Rand mine, kept its price to a penny during the past seventy years. Why this should be so, no one seems to know. We learn further from Mr. Webber that the "pure gold" of commerce is not really pure, but is of a purity represented by 996 parts in 1000, whereas fine silver may be put at 999 in 1000. After a preamble embodying these and other facts Mr. Webber proceeded to weigh out 9 dwts. of gold, 2 dwts. of silver, and 1 dwt. of copper. He then melted the silver and copper together under the flame of a blowpipe, afterwards adding the gold, in this way making a small bar of malleable alloy. This was hammered into a die—a simple half-round channel cut in a block of steel—the two ends of the bar were brought together, joined with a bit of gold solder, and in this way a finger ring was formed, which was afterwards taken away by the lecturer to be finished in the lathe. But before this was done Mr. Webber begged on behalf of the Club that the ring would be accepted and worn by the Hon. Secretary, Mr. Godfrey. And so a very pleasant episode and an interesting evening closed. We understand that Mr. Webber has consented, at the request of the authorities, to repeat this demonstration of gold working at the Photographic Convention, which meets at Newcastle in the summer.

On the 29th ult. the subject which occupied the attention of the Club was of a very different character. Mr. Burchett, a member well known as a capable painter as well as a photographer, gave an interesting discourse concerning landscape composition and arrangement, and was able in the course of his remarks to refer to the various excellent studies from his easel which hung upon the walls of the club room. But he depended more upon the examples which he executed in charcoal on large sheets of paper in illustration of his words.

Mr. Burchett commenced his paper by stating that a mere transcript of nature was incapable of giving much pleasure to the beholder, especially when, as in photography, the charm of colour was absent. In making a picture certain conditions of construction were necessary so as to develop the chief beauty of the subject, and that beauty might show itself most in foreground, the middle distance, or the sky. In every case the other parts of the picture must be subservient to this principal part, where beauty most resided. With regard to the general arrangement of a picture, it might be grouped under three different kinds of composition, namely, the angular, the pyramidal, and the circular, and in order to show how these three could be worked out, and how, in many cases, they overlapped one another, Mr. Burchett proceeded to draw with black chalk many striking examples. Thus the angular method of composition was illustrated by a cliff scene with a dark rocky foreground, all on one side of the canvas, which the artist proceeded to "balance" by the interposition of cloud forms on the other side.

The next formal method of composition to be illustrated was the pyramidal, used much by the old masters in their paintings, if we except the very early ones. In this case Mr. Burchett rapidly drew a ship lying idly by a quay, with a fisherman's hut to lend interest to the scene, the whole composition being comprised in lines which formed a pyramid, the base of which was the bottom edge of the canvas. The circular type of composition gave opportunity for another seascape, in which the sweep of a broad bay was balanced by the circular form of the clouds overhead. It was shown that, although this matter of balance in a picture was most important, it could be abused. For example, Mr. Burchett drew rapidly a landscape having a ruined mill at one side, and showed how the picture could be spoilt by putting a similar erection on the side opposite. Such a combination would, of course, be far from impossible in Holland, but it is constantly found that Nature requires considerable alteration before the items which she offers so lavishly to the artist can be welded into a picture.

Mr. Burchett was then able to show that there were many pictures, full of charm without formal composition, which depended upon their decorative effect and upon what he called rhythm. As examples, he showed sketches illustrative of the rhythm in sky and sea, and the rhythm of a ploughed field, and of growing corn. He followed these examples by pictures woven out of the rhythm of lines and curves. The lecturer

concluded his remarks with an exhibition of lantern slides, which emphasised his previous words. Most of these were taken in the winter time, amid the northern heights of London, and the lecturer urged upon his hearers that they missed many chances of taking lovely landscapes by putting away their cameras as soon as the cold weather set in.

Mr. Burchett's lecture was followed by an interesting discussion, which was initiated by the Chairman, Mr. Porter, of Eton College, in a few well-chosen words. Mr. Humphrey said that he was delighted to hear from an artist of Mr. Burchett's eminence that picture-making was possible without sticking to absurd rules. The most lovely thing in nature was a lovely woman, and yet no one could seriously contend that the female form was either angular, pyramidal, or circular. After this the discussion began to drift in the old groove, photography as opposed to art, and the well-known ideas were once more trotted out by various speakers. But all acknowledged that they were under a debt of gratitude to Mr. Burchett for an excellent and painstaking discourse.

WEST SURREY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE West Surrey Photographic Society held its Twelfth Annual Exhibition of members' work at the rooms of the Society, the Railway Hotel, Battersea Rise, S.W., on the 28th, 29th, 30th, and 31st ult.

In reviewing the Exhibition of the West London Photographic Society a few weeks ago, we felt it our duty to call attention to the unfortunate propensity of the members to confine their studies to a very small number of the many classes of subjects which are available for treatment by photography, with the result that their Exhibition gave one the impression that the members instead of cultivating originality were content to copy one another. What we said of the West London Society Exhibition we might say almost word for word of the Exhibition at present under review. The West Surrey Exhibition was divided into four classes, and, counting the Seascape Class as one with the Landscape Class, the classification usually adopted, the combined class contained no less than three-quarters of the entire number of exhibits. This proportion would not be too great, perhaps, had a fair amount of diversity existed in the class of scenery or even in the style of treatment, but it really seemed as though the Exhibition consisted almost entirely of the work done at some half-dozen of the Society's outings and that it was the custom of the members on these occasions to place their cameras in a row, each endeavouring to get as nearly as possible the same picture as his neighbour. While we fully recognise the pleasure and the educational good that may be derived from such excursions and the benefit the Society may also derive from the promotion of good fellowship amongst its members, if the result of them is to be the reduction of all the work done to a monotonous equality of subject, character, and quality, each member had better make his excursions in search of the picturesque under conditions which will necessitate the exercise of his power of selection.

Naturally, in a Society Exhibition, any tendency on the part of the members to follow in a beaten track is more noticeable than at other times; but one of the principal objects in holding an exhibition is to demonstrate to those exhibiting wherein is scope for improvement in their work, and we trust the members will follow the indication which must have been as clear to themselves as it was to us.

We have mentioned that the branches of photography other than landscape, &c., were evidently in little favour, with the exception of a passable figure study, the Portraiture Class being extremely weak. The remaining class, which included all other subjects, had a few small architectural studies which were not without merit. One or two fruit and flower pieces were passable, and a number of specimens illustrating an application of photography to the designing of patterns were interesting. A series of "zoo" pictures contained several that were very good examples of animal photography.

The Exhibition was well arranged, but one or two of the exhibitors indulged in plush and other gaudy frames, which ought to have secured the rejection of their exhibits.

In spite of our strictures, we must say that, as a whole, the work was distinctly in advance of that shown last year. In most cases the photography was technically good. The work was generally small in size, and the few enlargements there were not as a rule particularly successful.

The Judges were Colonel Gale and Mr. J. Taylorson.

AWARDS.

- Class I.—Landscape: Messrs. W. G. Rowse and I. E. Meadowcroft.
- Class II.—Seascape: Mr. S. Smith.
- Class III.—Portraiture: Withheld.
- Class IV.—Other Subjects: Mr. T. G. Tryhorn.

Our Editorial Table.

THE "HOLBORN" DISH COVER.

Manufactured and sold by George Houghton & Son, 88 and 89, High Holborn, W.C. THE "Holborn" dish cover is designed to protect plates from the light during development, fixing, &c. It is made of xylonite, and fits any dish

of the same material. As may be seen from the illustration, the cover can be slid on and off with the greatest ease. Messrs. Houghton rightly point out that it is advisable to keep a plate protected during development.



even from the ordinary non-actinic light of a dark room. When the plate is under-exposed and requires prolonged development, this especially the case. This cover will make a dish sufficiently light-tight to allow even of actinic light being used in the dark room if necessary.

THE Photographers' "Peerless" Note Book, which Messrs. George Houghton & Son, of 88 and 89, High Holborn, are issuing, should be found in the waistcoat pocket of every amateur photographer. Many useful data relative to exposure are given, and there are numerous spaces for making records of exposures. A railway accident insurance policy and other features, constitute the Peerless Note Book a useful thing to carry about.

MESSRS. ELLIOTT & SON, of Barnet, have recently given publicity to the announcement that they have placed on the market the "Medium plate, for field and studio use, to supersede the "Studio" plate, which by reason of its name, was but little used by amateurs. We have made camera tests of the sample of the Medium plate sent us, and found them highly sensitive, giving images of remarkable softness and freedom from granularity. For portrait work, in particular, the Medium plate seems to us to be particularly well adapted, and, no doubt, during the season just opening, it will be in great request for that purpose.

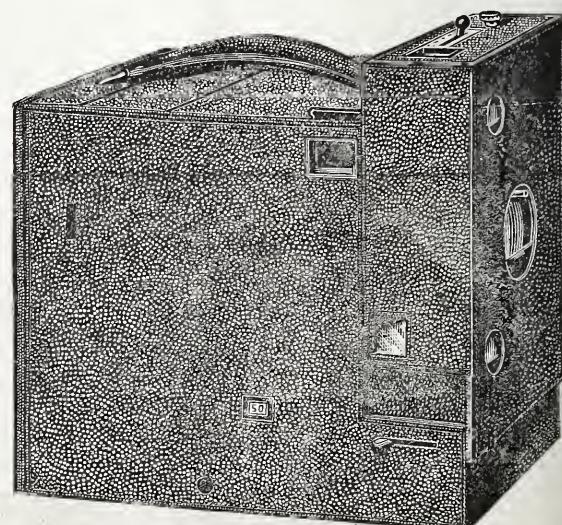
How to Use Collodion Emulsion Successfully is the title of a little book issued by Messrs. Penrose & Co., of Upper Baker-street, Lloyd-square, E.C. It is very freely illustrated, and the instructions and formulae are both terse and authoritative. The book appeals to process workers, who should find it of the highest service in making negatives for half-tone engraving.

MESSRS. PERCY LUND & CO., of Bradford, have recently made some additions to their very useful series of Nature mounts. These are supplied in a variety of neutral tints, and, from actual use, we can readily say that these mounts make very effective and artistic supports for photographs. They are supplied in packets or sheets. Messrs. Lund say that there scarcely a postal club in the kingdom where these mounts are not extensively employed.

MR. JONATHAN FALLOWFIELD, of 146, Charing Cross-road, London, W.C. sends us his Lists of "Job Lines," which he is now offering for sale. No. 1 is devoted to apparatus; No. 2, to dry plates, films, papers, &c.; No. 3, to mounts of all kinds, for views or portraits; No. 4, to general photographic goods. We can recommend these lists to those of our readers who are on the look-out for bargains in photographic apparatus or material. They are all sent post free on application.

THE 5 x 4 "TELLA" HAND CAMERA.

Manufactured and sold by the
Tella Camera Company, Limited, 110 Shaftesbury-avenue, London, W.
THE 5 x 4 size of plates or films, which at one time was very popular with amateur photographers, seems, after a period of comparative neglect,



to be regaining much of its former share of notice, and the Tella Company, wisely taking advantage of this circumstance, are this season making a feature of supplying the Tella Hand Camera in two sizes.

quarter-plate and 5×4 . It is due to the introduction of the camera for taking the larger film that we have been enabled once more to put the Tella to practical trial in the field. Our most recent experience of this clever changing system, which removes an exposed film from the focal plane, places a new one in position, and indicates the number of exposures made, by the simple in-and-out movement of a sliding-frame in the base of the camera, is that it works with unerring certainty. In the way of film-changing methods we know nothing so simple and effective. But the entire camera is a marvel of concentrated ingenuity applied to the prime purpose of imposing the least possible trouble on the photographer. Simple lever movements control the focussing scale, the lens aperture, and the speed scale. You set the shutter by pulling out one little rod, and the release is effected by a touch of the finger on another. A lens of high quality, two exceedingly brilliant finders, and horizontal and vertical fronts, summarise the remaining features of the Tella camera, which is beautifully finished, and so compact that its dimensions are kept within the small space of $9 \times 7 \times 5$ inches. It is two years since we first tried the Tella camera. After this comparatively long interval in hand-camera history, we remain of the opinion that the Tella changing system is one of the most notable achievements in mechanical ingenuity to be found in modern photography.

Studio Gossip.

A FIRE, caused by the vapour of spirit coming in contact with flame burst out one morning last week at 146, Strand, W.C., in a building occupied, in the upper floors, by the Strand Engraving Company, and, on the ground floor, by W. Christmas, hosier. Two rooms, occupied as a studio, were gutted, and the rest of the building was damaged.

"HE STOOD ALONE"—In her recently published article on Lord Beaconsfield, Lady Dorothy Nevill tells the following story: "I possess several old-time photographs of Lord Beaconsfield, and about one of these I cannot help relating the following anecdote: The picture in question was given me by Mrs. Disraeli, and in doing so she somewhat indignantly said, 'Fancy, the photographer actually wanted Dizzy' (so she always called him) 'to be taken standing near a chair, but I soon settled that, for I said Dizzy had always stood alone, and he shall continue to stand alone.'"

THE WAR AND PHOTOGRAPHY.—According to "Dagonet" in the *Referee*, the war has had its effect on the sale of photographs. The heroic male has, for the time being, taken the wind out of the sales of the graceful female. Mr. Alfred Ellis, of Baker-street, states that, since the war fever set in, he has a far greater demand for officers than he has for actresses. At the present moment you can count in the shop windows ten Baden-Powells to one Mabel Love. After Baden-Powell, the popular photographs are, of course, Lord Roberts and Lord Kitchener, but "B.-P." heads the list of sales by a good margin.

MR. FISHER UNWIN is publishing a book which Mr. Oliver G. Pike has been writing on wild bird life. Mr. Pike is a photographer, and here he gives pictures of British birds and their nests amid nature's surroundings. Some of the photographs were hard to get, and the difficulties and disappointments of the task are recounted. Mr. Pike's observations on birds have, like his pictures, been gathered first hand. The larger part of his volume refers to the birds which frequent woods, fields, hedgerows, and streams—the great bird world. In other chapters, however, he writes of the birds that are peculiar to the Norfolk Broads.

PENALTIES OF GREATNESS.—The penalties of greatness are, indeed, numerous, and increasingly so. The *Sydney Evening News* recalls the fact that that when Admiral Dewey, after the Battle of Manila, met General Greene, of the United States Army, he invited him to his cabin, with the remark, "Come and see my family." The "family" consisted of hundreds of photographs of babies—fat babies, thin babies, pretty babies, ugly babies, good-humoured babies, bad-tempered babies, and every other possible variety. "This is my family," said Dewey, "they are all George Deweys, and their parents have sent me all their photos."

MR. J. G. MAINDS, of 7, Huntly-terrace, Shettleston, Glasgow, writes: "I often notice you are approached through Correspondence columns of THE BRITISH JOURNAL OF PHOTOGRAPHY for advice on studio building. This week you have 'Anxious Inquirer.' Some of these people are really anxious, and, as I have a large and varied experience of studio-building—indeed, it is a hobby of mine—and am at the same time a professional photographer of some standing, I think I could help some of them, by way of preparing plans and estimates, better, I find, than any architect I have yet employed for the purpose. I should be glad if you would put me in communication with any of your correspondents."

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, April 11, 1900, at eight o'clock. Members' Open Night.

THE South London Photographic Society's Easter Excursions are to Salisbury, Romsey, Wilton, and Stonehenge, under the leadership of Mr. A. E. Allen, and to Wells, Glastonbury, and Cheddar. Friends of kindred societies are welcome.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, April 10, at 66, Russell-square, at eight p.m. "The Municipal Encouragement of Photography," by Thomas Bedding. The Exhibition of photographs by the National Photographic Record Association will close Saturday, April 21. Admission on presentation of card, ten to four.

MR. R. W. PAUL, of 44, Hatton-garden, kindly sends us two bromide prints from negatives received last week from a military friend at Paardeberg, one showing Cronje in his cart about to start for Capetown after his surrender, which scene is taken in Lord Roberts's camp at Paardeberg, and also a view of the Boer shell-proof pits in their camp, showing the camp exactly as it was left by Cronje's army on its surrender.

YORKSHIRE PHOTOGRAPHIC UNION.—The following gentlemen have been elected as the officers of the Union, 1900-1:—President: Mr. Percy Lund.—Vice-Presidents: Mr. Godfrey Bingley (Leeds), Dr. Hollingworth (Hull), and Mr. J. H. Rowntree (Scarborough).—Treasurer: Mr. Alexander Keighley, F.R.P.S.—Hon. Secretary: Mr. Ezra Clough. The Annual Excursion has been arranged to take place on Saturday, June 23, 1900, to Fountains Abbey and the immediate neighbourhood.

THE NEWCASTLE CONVENTION.—On Thursday, March 29, there was a meeting in London of the Council of the Photographic Convention of the United Kingdom. Mr. C. H. Bothamley occupied the chair, and there were present Messrs. F. A. Bridge (Hon. Secretary and Treasurer), S. B. Webber, J. L. Lyell, E. J. Humphrey, S. H. Fry, Thomas Bedding, A. Cowan, W. E. Dunmore, H. Snowden Ward, and E. J. Wall. Nearly the whole of the details for the meeting next July were discussed and settled.

ON the 22nd ult. the Brixton and Clapham Camera Club held a smoking concert, organized by the popular President of the Club, Mr. W. E. Dunmore. A capital evening's entertainment was provided by some accomplished vocal and instrumental performers, including Mr. H. Vivian Hyde, the Messrs. Fraser (banjo duettists), Mr. Walter Howard (son of the famous Moore & Burgess Minstrel of that name), Mr. Aubrey Wills, and many others. In the course of the evening a collection was made for the *Daily Telegraph* War Fund.

THE Plymouth Photographic Society has been fortunate in securing as Judges of its Sixth Annual Exhibition, to be opened on May 23 next, Dr. P. H. Emerson, F.R.P.S.; Dr. Aldridge, of Plympton, an amateur artist and photographer; and Mr. H. R. Babb, who, in addition to being the Head Master of Plymouth's oldest school of art, is a photographer. Entries close on May 9, and, with double fees, a week later. Silver and bronze medals and certificates of merit are offered for landscape, figures, architecture, and lantern slides in members' and open classes.

THE Royal Meteorological Society attained its jubilee on Tuesday, April 3 having been founded on April 3, 1850. The celebration of this fiftieth anniversary was commenced at a Commemoration Meeting held on Tuesday afternoon, when the President, Dr. C. Theodore Williams, delivered an address. A *conversazione* was held at the Royal Institute of Painters in Water Colours in the evening. In addition to the pictures in the Galleries, there was also an exhibition of meteorological instruments, models, and photographs, and lantern demonstrations were given by Colonel H. M. Saunders, Mr. T. C. Porter, and Mr. W. Marriott. On Wednesday, April 4 there was an excursion to the Royal Observatory, Greenwich, and a dinner at the Westminster Palace Hotel. As a memento of the jubilee of the Society, a bronze commemoration medal, bearing on the obverse a portrait of Luke Howard, F.R.S., has been struck.

THE Copyright case of Hussey *versus* Harmsworth was tried before Mr. Justice Ridley and a common jury last week. It was an action to recover penalties and damages for an alleged infringement of copyright in photographs. Mr. Rentoul, Q.C., and Mr. Watt appeared for the plaintiff, and Mr. Robson, Q.C., and Mr. Scrutton for the defendant. The plaintiff was Mr. Charles Hussey, a journalist and photographer, and the defendant, Mr. Richard L. Harmsworth, proprietor of *Golf Illustrated*. The case for the plaintiff was that, without his licence or permission, the defendant reproduced in his work, published in June 1899, copies of three photographs which he took at the Romford Golf Links. These photographs had previously appeared in two other publications with the plaintiff's permission. As soon as he saw the reproduction by defendant, the plaintiff registered his copyright in them under the Act of 1862, and he claimed penalties imposed by that Act for subsequent publications, besides damages and an injunction. The defence was that permission to reproduce the photographs was obtained from the publishers of the works in which they first appeared, but legal objections to the plaintiff's claim were also raised, involving the interpretation of certain clauses of the Act. Ultimately the parties agreed to judgment for the plaintiff for 20*l.* and costs on terms. The learned Judge said he thought that was a very reasonable arrangement.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—A meeting of the Executive Committee was held on Tuesday, March 27, at 66, Russell-square, Mr. H. Snowden Ward in the chair. Steps for the acquisition of an illustrated lecture on "Gothic Architecture" were taken, and an announcement will be made in due course. Further business respecting the Conference of the Lancashire and Cheshire societies was transacted. A report was received from the Sub-committee on the possibility of getting together a lighter collection of pictures for circulation. This is not intended to supplant the existing collection, but it is expected to be useful for one-evening shows where it is not wished to incur the expenses of carriage of the larger collection. Replies from the authors of Affiliation lectures who are willing to read their papers for a consideration were received. Their names will be indicated in the *Photographic Red Book*, and the terms can be ascertained from the Secretary. Final arrangements for the revision of some of the above lectures were made, and the work will be effected during the summer months. The following lectures and slides are likely to be soon ready for circulation: "Scenes on the Pennsylvania Railroad," with notes; "Royal Meath and County Wicklow," 100 slides, with

notes by members of the South London Photographic Society; "Tinworth's Panels," seventy slides, and notes upon his life; "Colour Photography up to Date," by Mr. E. J. Wall; "Architectural Photography Pictorially Considered," by Mr. H. W. Bennett.

THE NATIONAL PHYSICAL LABORATORY.—Mr. R. T. Glazebrook, F.R.S., Director of the National Physical Laboratory, Old Deer-park, Richmond, Surrey, has issued a circular letter respecting this newly formed establishment. In the year 1898 a Treasury Committee, of which Lord Rayleigh was Chairman, recommended the establishment of a National Physical Laboratory for standardising and verifying instruments, for testing materials, and for the determination of physical constants, by the extension of Kew Observatory. At the request, and with the support of Her Majesty's Government, such a National Physical Laboratory has been established, and the Royal Society have appointed an Executive Committee to manage it, and, among other duties, to control the work which has in the past been carried out by the Kew Observatory Committee at the Kew Observatory. This work has been transferred by the Kew Committee to the Royal Society. The Executive Committee, of which the President of the Royal Society is Chairman, Lord Rayleigh Vice-Chairman, and the Permanent Secretary of the Board of Trade an official member, includes representatives of the Royal Society, the Kew Committee, the Institutes of Civil, Mechanical, and Electrical Engineers, the Iron and Steel Institute, the Society of Chemical Industry, and the Institute of Naval Architects. It is the intention of the Committee to continue and extend the work of testing scientific instruments hitherto carried on at the Kew Observatory, and they believe that this will be benefited in every way by the increased facilities for experimental investigation afforded by the resources of the Laboratory. The Committee are glad to add that Dr. Chree, together with all the present members of the Observatory staff, have consented to transfer their services to the National Physical Laboratory, so that the continuity of the work will be fully maintained. Certificates will bear the heading, "National Physical Laboratory, Richmond, Surrey," and will be signed by the Director. Instruments and other articles sent for testing should be addressed to the Director, National Physical Laboratory, Old Deer-park, Richmond, Surrey.

LAST week there was a Torchlight Carnival at Penge in aid of the *Daily Telegraph* War Fund. We learn from the *Beckenham and Penge Advertiser* that, conspicuous amongst the illuminated premises, the front of the Platinotype Works was bright with Chinese lanterns and electric fairy lamps, and that one of the most striking and picturesque ornaments in the procession was a perfect copy of the new Vickers quick-firing gun, manufactured entirely at the Platinotype Works, Penge, under the sole direction of Mr. J. Smith, the engineer of the Company. As regards size and bore this ornamental weapon is an exact copy of the 4.7 inch naval gun which played so prominent a part in the defence of Ladysmith, but in detail it is a reproduction of the latest and most successful quick-firing gun, manufactured by Messrs. Vickers, Sons, & Maxim, Limited, to the order of the United States Navy. The dimensions of a somewhat smaller gun, a three-inch model, were copied by permission of Messrs. Vickers, and every detail has been most faithfully reproduced by Mr. Smith and the employés at the Platinotype Works. The length of this cleverly made model is twenty-one feet. It is most substantially put together, as may be gathered from the fact that, although almost entirely composed of wood, it weighs just upon ten hundredweight. The interior is lined with metal, and the construction of the real weapon has so far been followed as to make it possible to fire the model. This has been accomplished by a very ingenious plan, devised by Mr. Smith himself. The only ammunition, if such it can be called, that is used is compressed air and hydrogen gas, but this gives a tremendous report, and on trial within the works several windows were shattered; and therefore it was not thought desirable to bring the gun into action while in procession. The pattern Vickers gun can be fired every five seconds, but Mr. Smith can do even better than this with his adaptation, though probably it would not be so effective in actual warfare. The gun is mounted on the new type of Naval conical mount, and the cradle and hydraulic buffers with which the recoil is regulated have all been very ingeniously copied in the manufacture of the model. In fact, at a very short distance, it would be impossible to pick out the model from the actual gun, and this similarity has been rendered all the more striking by the coat of paint in which it appeared. The free movement of the model has been carefully arranged for, and it can be run round, elevated, or depressed, and, in fact, behaves as a proper naval gun should. The shield only was omitted, and it was found impossible to include this as there was some danger of the top colliding with the bridges *en route*. The whole was placed on a car drawn by four horses, with mounted men in R.H.A. uniform, and a number of formidable-looking armour-piercing shells carried alongside to complete the effect. The gun crew, smartly attired in the regulation naval costume, stood to the "ready" on either side, and completed the effect, the reception with which they were greeted testifying to the great popularity of the tableau. We have been favoured with a photograph of the gun and its crew. The former looks astonishingly real and workmanlike, and the Jack Tars appear quite capable of casting aside mimicry and rendering a good account of themselves in actual warfare. We congratulate all concerned in the construction and exhibition of the Penge quick-firer, which, rumour says, will be "let off" on the night of Mafeking's relief.

Commercial Intelligence.

MESSRS. J. J. & T. G. BLUNDELL, refiners and dealers in gold, silver, sweep, &c., of Wardour-street, W., have removed to No. 199 in that thoroughfare, and not 190 as stated in a previous paragraph.

LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY.—The report of the Directors for the year ended December 31 last recommends that a dividend at the rate of four per cent. per annum, less income-tax, be paid on April 6, and that 241*l.* be carried forward to the current war.

THE THORNTON-PICKARD MANUFACTURING COMPANY send us a new edition of their illustrated catalogue, printed in the Spanish language. They now issue four distinct catalogues—English, French, German, and Spanish—and will be very pleased to supply any of our readers who have friends in the different countries where these languages are spoken with a catalogue to send to them if they are interested in photography.

MR. HENRY F. PURSER, of 33, Hatton-garden, E.C., inform us, that under the name of the Busch Camera Company, he intends to supply the photographic trade with a series of hand and stand cameras, ready fitted with Busch lenses. This step has been taken as a result of the increased popularity of these lenses and a desire continually expressed in the photographic world to be able to buy ready-fitted cameras with the Busch lenses.

MESSRS. R. & J. BECK, Limited, of 68, Cornhill, London, E.C., are introducing a new Frena film, "The Tropical" (Austin-Edwards'), which are specially manufactured to resist tropical climates. The emulsion is rapid, being slightly faster than the Austin Edwards' Instantaneous. It is manufactured on a new formula to ensure the maximum power of resisting deleterious climatic influences. The films are packed in tinfoil and oiled paper; nevertheless, Messrs. Beck recommend as an extra precaution that films in damp and hot climates should always be kept, when not in use, in the tin boxes sealed with surgeon's plaster, which they supply for this purpose.

Patent News.

THE following applications for Patents were made between March 19 and March 24, 1900:—

PROJECTION APPARATUS.—No. 5292. "Improvements in Projection Apparatus." Complete specification. J. J. FRAWLEY.
APPARATUS.—No. 5307. "Improvements in Photographic Apparatus." E. A. HARDY.
VIGNETTING FRAMES.—No. 5424. "Improvements in and relating to Vignetting Frames for Photography." R. BURGESS, JUN.
DARK-ROOM LANTERNS.—No. 5564. "Improvements in Dark-room Lanterns." Complete specification. A. C. JACKSON.
DARK SLIDES.—No. 5583. "Improvements relating to Dark Backs and Holders therefor for taking successively several Photographs on the same Plate." C. LAUX and H. KRANZ.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
9.....	Bradford Photo. Society	Wensleydale. George Thistletonwaite.
9.....	Glasgow and West of Scotland	Annual Lecturette Competition.
10.....	Birmingham Photo. Society	{ A Loan Collection of Lantern Slides from Various well-known Workers.
10.....	Hackney	{ Latest Velox Printing. Donald C. Nightingale.
10.....	Isle of Thanet	Portraiture. Harold Baker.
10.....	Leeds Photo. Society	{ Chance Shots taken on a Business Journey in Switzerland. J. H. Walker.
10.....	Royal Photographic Society	{ The Municipal Encouragement of Photography. Thomas Bedding.
11.....	Bootle	Prize Slides.
11.....	Croydon Camera Club	Conversational Meeting.
11.....	Photographic Club	Members' Open Night.
12.....	Leigh	{ The Hand Camera; its Use and Advantages. Mr. Lythgoe.
12-18	Liverpool Amateur	{ Excursion: Ludlow and District. Leader, Paul Lange.
12-17	South London	{ Excursions: Salisbury, Romsey, Wilton, and Stonehenge. Leader, A. E. Allen.
13.....	Croydon Camera Club	{ —Wells, Glastonbury, and Cheddar.
13.....	Whitby	{ Excursion: Cuckfield and District. Leader, W. H. Rogers.
		Members' Work and Apparatus Night.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 3.—Lantern Evening.—Mr. J. J. Vezey in the chair.

The decision of the Council of the Society to inaugurate a series of lantern evenings, to be held monthly from November to April inclusive, has been amply justified by the success of the meetings which have taken place during the session, which terminated on Tuesday evening. The lecturers chosen have been recognised, both as authorities upon the subjects with which they have dealt, and as masters of the art of lantern-slide making; and the large audiences which have assembled on each occasion have thoroughly appreciated the excellent provision made for their entertainment, a considerable number of ladies having accepted the special invitation which is given to them to be present at the interesting and enjoyable gatherings. There has been no

monotony about these lantern evenings, for a pleasing variety of subjects has been illustrated, the list including *Medieval Towns of Germany*, by Mr. J. J. Vezey, with slides by Commander Gladstone; *Ely Cathedral*, by Mr. F. H. Evans; *Round about the Matterhorn*, by Mr. H. Speyer; *Shakespeare at Home*, by Mrs. Snowden Ward; *Beauty Spots of British Scenery*, by Mr. J. A. Hodges; and Mr. F. P. Cembrano's series of slides referred to below. Having regard to the entirely satisfactory result of the experiment, there can be no doubt that the Council will arrange for the monthly lantern evening to become a permanent feature of the winter session of the Society.

SLIDES NEW AND OLD.

Mr. F. P. CEMBRANO, who has, during the past few years, unfortunately almost entirely discontinued photographic work, exhibited a collection of slides, which he grouped together under the above title, and which, for technical and artistic excellence, would be difficult to beat. Beginning with some winter scenes in the neighbourhood of Richmond, which proved that it is not necessary for Londoners to go very far away in their search for good subjects for the camera, he next showed a number of Convention views, taken in Scotland, and these were followed by some fine studies of sheep and cattle, photographs of the Norfolk Broads, and many other very interesting and beautiful pictures. The final series were from negatives taken in Seville. The Cathedral, in size inferior only to St. Peter's at Rome, being 415 feet long, 298 feet wide, and 150 feet high to the roof of the nave, was illustrated by several interior and exterior views, one of the Giralda, a bell-tower of Moorish origin, the lower part of which was built in the twelfth century, being especially noticeable. The Casa de Pilatos, or house of Pilate, in which Pontius Pilate is said to have lived, was represented by two or three slides, but the most beautiful of all were those of the Alcazar, the chief relic of the Arab dominion in Seville, and a building which, in interest and beauty, is excelled only by the Alhambra of Granada. The photographs of the wonderful halls and courts of the Alcazar were received with repeated applause and much admiration. At the conclusion of the Exhibition, Mr. Cembrano showed a reproduction of one of the pellicles sent by pigeon post during the siege of Paris, containing several pages of news from the beleaguered city, and he presented the slide as an addition to the Society's collection.

COMING EVENTS.

At the Ordinary Meeting to be held on April 10, Mr. T. Bedding will read a paper on "The Municipal Encouragement of Photography." At the Technical Meeting on April 24, Mr. Bridges Lee, M.A., will deal with "The Latest Developments of Metro-photography." On Wednesday, April 25, Mr. F. H. Evans will open an Exhibition of his works, mainly architectural, which will remain open until May 25. There will be no meeting on April 17 (Easter Tuesday).

PHOTOGRAPHIC CLUB.

MARCH 28.—Mr. Hans Müller in the chair.

Messrs. J. J. GRIFFIN & SONS' representative gave a demonstration of the now well-known Velox printing papers, and in the course thereof answered a number of questions put to him by the meeting. It was, he said, impracticable to use Velox paper for direct enlarging on account of its slowness, but, for contact printing, he claimed for it a great superiority over bromide paper, both for its clear whites and pure grey-black deposit. There was no suspicion about its permanence. Prints made in 1897 showed now no signs of deterioration, and he saw no reason to expect any. Velox paper seems to have both species and varieties. That known as Carbon Velox is especially for contrast; Special Portrait Velox is most suitable for general purposes and soft effects. Brilliant results may be secured from thin, flat negatives on Carbon Velox, which, with an average negative, would tend to give chalkiness. It is called Carbon because of the deep black colour of the images obtained, and the name must not be confounded with the carbon printing process. Warm tones on Velox paper may be secured with kachin developer, and one or two prints were made. The speeds of Carbon and Portrait Velox were given roughly as four to nine respectively. It seemed to be not altogether certain that a number of warm-toned prints, which should be quite uniform in tone, could be obtained from one negative without developing them all at one time in one dish, and this, of course, is somewhat of a drawback. During a discussion regarding the relative claims of bromide paper *versus* Velox paper, the demonstrator championed the cause of the latter paper, and, although the meeting was not prepared to agree with all he said on this matter, it was conceded that the results upon Velox paper were very satisfactory and often beautiful. A quality peculiar to Velox is that one cannot develop beyond a stage decided by the exposure received. With a correct exposure no over-development can take place, but a sufficient exposure must always be given. In other words, there seems to be little latitude in exposure. It was also asserted that no variation of distance in exposing the paper to the gas or other light would alter the contrast of the result. There is thus no inducement to protract the exposure with that hope. An acid fixing bath with a hardening agent is recommended, because of the large quantity of alkali used in the developer. After such treatment, prints may be toned in hot hypo and alum at 104° without hurt. The paper is a loosely wove paper and floats. On this account it is said to wash more quickly than ordinary papers. Several prints, both warm and black in tone, were produced before the meeting during the evening.

Croydon Camera Club.—The Tenth Annual Dinner.—The attendance at the above, held on Wednesday, the 28th ult., at the King's Arms Hotel, Croydon, was larger than for some years past, and the proceedings were kept up with all the vivacity and *esprit* of former gatherings. The "artistic temperament" seems to lend itself to mirth and brightness, so that, when, at the outset, the Chairman (Mr. Hector Maclean, President of the Club) laid down the rule that all speeches must contain at least one laugh, and must not occupy over five minutes, those present seemed to have not the slightest difficulty in complying. Indeed, laughter was the order of the evening. Mr. Albert

Spearpoint, perhaps, was the chief conspirator in the killing of "black care," his singing of the serio-comic being superb in its energy. Mr. Feast also scored up a multitude of smiles with a dramatically rendered recitation, in which a bilious beadle parodies the "Dream of Eugene Aram." Another who made his mark was Mr. Baldwin, the Paget (*sur*-prise plate-polisher). His "Wail of a Banner-bearer" proved, as the President remarked, anything but a "wale of tears." The high water-mark of interest culminated with the toast of "The Croydon Camera Club." In reply, Mr. MACLEAN lightly touched upon what the Club had done during the past few months, referred to the valuable services rendered by the Hon. Secretary (Mr. W. H. Rogers), and took the opportunity to state the financial result of the "Khaki" Lantern Show, from which it appeared that, after paying all expenses, the net profit amounted to as much as 82*l.* 15*s.* 9*d.*, an announcement which was received with prolonged cheering. An innovation in the list was the toast to "The Kindred Societies," speaking to which the PRESIDENT stated that both he and the Club knew how to welcome any similar society, whether old or new, near or far. He added that they had already sent out some photographic missionaries to convert the "Heathens," and would gladly continue to help the young Society, which had lately been formed, under the Presidency of Dr. Fowler, with whose name the toast was coupled. Dr. FOWLER, in well-chosen words, acknowledged the broad-mindedness of the Club, and spoke of the various members who had, in different ways, helped the young Society by giving demonstrations and otherwise.

South London Photographic Society.—This Society held their Annual Meeting on Monday last. The Hon. Secretary presented his report, showing the membership was still increasing, and had now reached a total of 201. The meetings had been well attended, and the long period excursions a thorough success. The Annual Exhibition, held in March last, had drawn a large number of competitors in the open classes. The Society had purchased a new 12×10 outfit and the long-desired book-case. Alterations to the rules were made, the most important being the permanent election of Vice-Presidents. The election of officers for the current year resulted as follows:—President: Mr. C. H. Oakden, F.R.P.S.—Vice-Presidents: Messrs. A. E. Allen, H. E. Farmer, J. T. French, S. W. Gardner, M. Howell, and W. F. Slater, F.R.P.S.—Committee: Messrs. G. Brown, E. R. Bull, C. Churchill, C. F. Dickinson, A. Fellows, W. Howell, E. Mathews, E. G. Ruckes, and G. J. T. Walford.—Delegates to the Affiliation of Photographic Societies: Messrs. C. H. Oakden, and F. Goddard.—Curator: Mr. W. C. Boyce.—Hon. Lanternist: Mr. H. F. Mawbey.—Captain of Cyclist Members: Mr. H. Esler, 4, Queen's-road, Peckham.—Vice-Captain: Mr. F. W. Grigg.—Hon. Treasurer: Mr. E. A. Whitby, 26, Philpot-lane.—Hon. Secretary: Mr. F. Goddard, Woodlands, Vanbrugh-hill, Blackheath.—Assistant Secretary: Mr. S. W. Whiteman.—Excursion Secretary: Mr. H. E. Beckett.

Aintree Photographic Society.—The Annual Meeting of this Society has just been held. The general and Exhibition balance-sheets being satisfactory, the following Executive for the coming year has been elected:—Patrons: The Right Hon. Lord Mayor of Liverpool and City Councillors Messrs. Farmer, McGuffie, and Kelly.—Hon. President: Mr. Isaac E. Bennett.—President: Mr. John Harris.—Vice-Presidents: Messrs. William Lockier and Charles Henry Adkins.—Council: Messrs. Rigby, Lloyd, Kidd, Smith, Bamford, Watson, Heron, Ackerley, Warburton, and Ansdel.—Lanternist: Mr. Thomas Beer.—Treasurer: Mr. Thomas Binnie.—Reporter: Mr. Daniel J. Neill.—Secretary: Mr. Theo. Wood, of Highfield-road, Walton.—Assistant Secretaries: Dr. Nixon and Mr. Ralph Walker. A syllabus for the next twelve months is in course of preparation.

FORTHCOMING EXHIBITIONS.

1900.

- April 6, 7 Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.
May 23–25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE METRIC SYSTEM.

To the EDITORS.

GENTLEMEN,—Mr. "Free Lance" shows, in his answer (page 206 of THE BRITISH JOURNAL OF PHOTOGRAPHY), that he has a bad temper. When he uses sarcasm towards others, it is high smartness and perfect truth, while, when others use it, it is a lack of veracity. Compare his letter with that of "J. F. T." and you will find the first one as full of empty

words, playing on the word "livre," as the second letter ("J. F. T.'s") is full of sense and facts, and easily understood by any one. Every one here (except the legal documents) uses the word "livre" to mean half a kilo, or 500 grammes, and it has no other meaning when weight is meant; and when a party asks for a pound, or half, or quarter pound, why should he feel more obliged to ask otherwise, such as 500, or 250, or 125 grammes, than an Englishman who does not ask for 16, 8, or 4 ounces of anything. As to the reference of weight as to metric system, I may add the following: A cubic metre, if filled with distilled water, will weigh exactly 1000 kilos, and a cubit decimetre will then be 1 kilo, a cubic centimeter will be 1 gramme, hence one can see how the meter and the kilogramme are related one to the other.

Says "Free Lance," "*The fact is, for all ordinary purposes of life, a decimal system of subdivision of weights and measures is a failure.*" Proofs of this will show themselves in time in England, and peacefully, notwithstanding "Free Lance's" powerful opposition. In the meantime, if France would succumb under "F. L.'s" adverse opinions, it can stand it. However, since the metric or decimal system is used in Germany, Austria, Belgium, Italy, Spain, &c., and if not yet in America, there is a good start at it with the dollar system of 100 cents, and the other measures will follow, even if in 1821 adverse opinions were expressed; but opinions change with time. As a continuance of this would prove of little interest to the public in general, I will answer no more on this subject.—I am, yours, &c.,

A. Lévy.

Asnières (Seine), April 1, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

COPYRIGHT.—COPYRIGHT asks: "If having a copyright photograph, am I at liberty to send same to more than one illustrated journal for publication, and to receive payment for each?"—In reply: Yes.

S. B. R.—We should say it is simply a case of the shutter not being set to sufficient rapidity. In No. 2 the locomotive is broadside on, and that is a difficult subject to secure quite sharply unless you have extreme rapidity of shutter and plate. In No. 1, the fact that the carriages are less unsharp than the locomotive is due to the fact that they are situated at a greater distance from the camera.

J. U. H.—1. *The Studio and What to Do in it*, by Mr. H. P. Robinson, published by Sampson Low & Co., St. Dunstan's House, Fetter-lane, E.C., might assist you. 2. Messrs. Watson, of Holborn, sell the Guerry shutter, which admirably answers the purpose. We have no experience of the one named, nor of that mentioned in No. 3. 4. Not imperative, but in our experience desirable. 5. We have not seen the apparatus.

VALUE OF LENS.—TAFFY writes: "I have placed in my hands to sell a large portrait lens, for which the late owner paid, I believe, 34*l.* 10s. to Messrs. Ross. It is twenty-eight inches focus, and ought to be splendid for large heads. I am asked not to take less than 12*l.* for it, and think it should be saleable at that price. Will you please say what is your own idea of the price named?"—We should say the price was reasonable to any one who wanted such a lens. By the way, we do not find any lens, of that focus and price, quoted in the catalogues of Ross. Are you sure it was made by that firm?

THE REV. GERARD W. BANCKS, of Durham House, Green-street-green, Dartford, writes that he is interested in the photography of children, and asks us to tell him where he could get any help in this branch of the art. "Are there any books published, or any collections of reproductions of photographs of child studies? Who are the chief child photographers?"—In reply: We know of no book specially devoted to the subject. As photographers of children Messrs. Byrne, of Richmond; Messrs. Speight, of Regent-street; and R. Faulkner, of Baker-street have been very successful. A study of their productions might prove helpful to our correspondent.

NOISE OUTSIDE A STUDIO.—QUERY writes: "I occupy a second-story flat (with exception of one room between my reception and workroom) at a rental of 43*l.* This room, valued at a rental of 5*l.*, my landlord has let (together with one of the basement shops) as a tailor's work-room. Noisy talking, laughter, and singing repeatedly goes on, in addition to the din of sewing machines, &c., which, apart from making my premises seem low when customers come, is most irritating and annoying. As I pay the larger rent, can I legally raise objections?"—In reply: Better consult a solicitor on the subject. You might have a remedy if the noise, &c., interferes with your business.

BATTERY FOR ELECTROTYPEING.—S. SELLS asks: "What is the best form of battery for depositing copper on photo bas-reliefs?"—The Smeee form is the most convenient and cleanly to employ, and it is the one in most general use where a dynamo is not available. The Daniell is also a good form for electro deposition, but we ourselves much prefer the Smeee with large-size plates.

THE ORTHOSCOPIC LENS.—T. HEWILL. You have been misinformed. The orthoscopic lens is not free from distortion, but the distortion is in the opposite direction to that given by a single lens, that is, the marginal lines are curved outwards—pincushion distortion. With a single lens they are curved inwards—barrel-shaped distortion. The orthoscopic is, however, a good lens for some purposes.

COPYRIGHT.—W. A. A. says: "I have a negative that was taken by an operator of mine about ten years ago at the customer's own house, which has now become valuable to me. It was not registered at the time, and I cannot register it now in the operator's name, as he died a month or two after he took it. Can I register it in my own name?"—No. The copyright in the picture was vested in the author, and, as he has been dead over seven years, it has lapsed.

CARBON PRINTS STICKING TO GLASS.—M. WARLEY says: "Can you kindly tell me the cause of these prints sticking so firmly to the glass? The plates were well rubbed over with French chalk, and the collodion was the usual enamel collodion, allowed to set well before it was put into the water, and all the ether and alcohol was well washed out of the film before the tissue was squeegeed upon it. I have been pretty successful with the carbon process, single transfer, but have only just tried glass, and all the prints stick in this way."—From the appearance of the prints, we have no hesitation in saying that the glass was not thoroughly clean when the French chalk was applied. The plate must be absolutely clean, or there will always be the danger of the prints sticking.

CONVERTING METALLIC GOLD INTO CHLORIDE.—SCUMY TYPE asks for the best way to produce chloride of gold from the metal. He has a quantity of old metal, and would like to turn it into chloride. Also, what would be the easiest way to crystallise the same?—The gold contains an alloy which must be got rid of. Put the metal in a Florence flask and pour on it nitro-hydrochloric acid—one part nitric, and five parts hydrochloric, and three parts water. A gentle heat will facilitate the solution. When dissolved, dilute with water, filter, and then add a solution of pure sulphate of iron, which will precipitate the gold. Wash well, and redissolve in acid. Then crystallise in a Berlin evaporating dish over a sand bath, but not at too great a heat.

DIFFICULTIES IN COPYING, &c.—J. H. T. writes: "I have to copy some papers, many of them stained, and some yellow, others faint, and in pencil. 1. Would a screen be any value? 2. If so, what colour? 3. If a screen no use, how can I obtain greater contrast than exists in originals? They desire them black and white, especially a black. The plate I used was photo-mechanical, speed 14, by Wynne's calculator, I am accustomed to use his Infallible meter for ordinary copying, and the invaluable lens Dallmeyer's stigmatic, stop f-32. Please, also say what is eau-de-javelle, ALMANAC, p. 947—have an idea it is calcium chloride."—1. and 2. A screen would be of no advantage. 3. Orthochromatic plates, sensitised for yellow, would help. Give a full exposure and develop, so as to get as much contrast as possible. A full amount of pyro and a liberal dose of bromide. Eau-de-javelle is hypo-chlorite of potash, see p. 1085 of the ALMANAC.

STUDIO-BUILDING.—COUNCIL says: "I notice in this week's JOURNAL that you answer one of your correspondents, re Studio-building, that the district surveyor might require structure to be of brickwork and glass." I was thinking of buying a portable studio, as per enclosed, and erecting it at back of premises. Would you kindly say if it could be objected to by district surveyor, as it is only wood and glass? I understand these portable buildings are tenants' fixtures. If you think it could not be objected to, would you also say if you think them practicable for professional work? They are made up to 24 ft. long, but I have never seen one, so don't know what they are like."—The by-laws relating to buildings vary in different towns, and we are not aware how they stand in yours. We should say that the structure you propose would be allowed if it were placed at some distance from the house, but you had better consult the town surveyor. The studio, if merely placed on the ground, and not in any way attached to it, would be a tenant's fixture. The studio, as shown in the cut, would do very well for professional work, though it would be better a little longer.

PREVENTING THE ADHESION OF PRINTS TO GLASS.—J. H. P. writes: "Can you oblige with the information to prevent prints from sticking to glasses during process of imitation enamelling? I have had great waste (see prints herewith). I may say I am convinced the printer has chalked the glasses properly, also used alum, although I fancy he guessed the measurement. Would that make a difference? The washing process is, I think, right—four hours in running water (always in circulation). It does not matter how long the prints are allowed to stay on glasses, sometimes they refuse to leave without sticking in various places, so it cannot be that they are not dry enough, and I know it is possible to give them too much drying if placed too near the fire. They come off all right in summer; it is during the winter months I have this bother. Would you recommend a stove-pipe arrangement for heating the room, and have temperature a certain degree? If so, please say what degree?"—If the prints are alummed and the glasses thoroughly cleaned and French-chalked, the prints should not stick. If these conditions are fulfilled, we cannot conceive why they do. We rather surmise, from the letter, that some artificial heat has been used in the drying. If that is so, the sticking may readily be accounted for.

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EX CATHEDRÂ.

THE war in South Africa is understood to have had a depressing effect on the sale of all classes of books and other publications, except those dealing with the subject which occupies such a prominent place in most people's minds just now; but we are pleased to find that those disturbing influences have left THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC unaffected. It is our agreeable duty to notify our readers that the entire edition of the ALMANAC for 1900 has been quite exhausted within about three months of publication, and that our publishers are unable to supply further copies. We may, perhaps, be permitted to cite this interesting fact as an indication of the undiminished hold which the ALMANAC retains upon its large army of readers, amongst whom are to be found all classes interested in photography.

* * *

THE April number of the Camera Club *Journal* contains the following remarks: "We notice, with much regret, two paragraphs in THE BRITISH JOURNAL OF PHOTOGRAPHY of March 16

last, in regard to our report of Mr. Henry Speyer's lecture on "Round About the Matterhorn," when the Chairman made some remarks with regard to the photographic Press. THE BRITISH JOURNAL OF PHOTOGRAPHY expresses surprise that the gentlemen responsible for the editorial control of the Camera Club *Journal* should have permitted that publication to be made the vehicle of such strictures. We can assure our readers that we are anxious to be on the most friendly terms with the photographic Press, and we have a very high opinion of THE BRITISH JOURNAL OF PHOTOGRAPHY and its able and genial Editor. Any idea of casting strictures was far from our thoughts. As we have said before, the proceedings of the Club are reported fully in our *Journal*, and it must be clearly understood that remarks made at our meetings, although reported in our pages, are not to be regarded as *ex cathedrâ* statements of the Camera Club, or even as in any way expressing the personal views of the members of the Editorial Committee. From what we know of the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, we feel sure that he will accept this statement in the same spirit in which it is made." We do so unreservedly, of course, and, in closing the incident, take the opportunity of assuring the Camera Club and its *Journal* of our unabated interest in the one and our high esteem for the other.

* * *

LINENDRAPERS, it is well known to our lady friends, are in the habit of marking their wares as so much three farthings. "One eleven three" is well known to be practically two shillings, as the farthing change out of that amount means a packet of pins, which, of course, carries a good profit. Cutting stationers and others are now following on similar lines, but in this case usually a lead pencil or some other trifle is given. The latest idea that has come under our notice is photographs. A friend of ours recently made a purchase at a stationer's, and a farthing change was required. "Sorry I have not a farthing, but would you mind taking a packet of these photographs?" The packet was accepted from a pile on the counter, and it contained six collotype prints of fair quality, views of the Tower of London, done up in an envelope bearing the title and the name of a well-known London house, a limited company.

The prints were of about the half-plate size, on paper about $8\frac{1}{2} \times 6\frac{1}{2}$ inches. It is very difficult to imagine how these pictures were produced to give as a farthing change, and, presumably, carry a profit at that—that is, if they were produced with such a view. Be that as it may, they were given in the usual way for the farthing change. In face of this, one may well ask, What is photography coming to?

* * *

At a meeting at the Guildhall last week, the Chairman of the Gresham Committee of the Court of Common Council, in reply to a query, said that seven out of the twenty-seven panels in the Royal Exchange had already been filled with paintings by distinguished artists, and that four more are in course of preparation. These will also be by well-known artists—one by Mr. E. A. Abbey, R.A., one each by Mr. and Mrs. Ernest Normand, one by Mr. Brangwyn; the name of the fourth artist was not given. These pictures, like the others, are the presentations of various donors. At the same meeting it was decided that the forthcoming Loan Exhibition at the Art Gallery at the Guildhall should be open to the public on Sunday afternoons.

* * *

It was also stated, at the same meeting of the Common Council, that six competitive designs for the new Law Courts at the Old Bailey had been received, and that the Corporation were being assisted in their selection by the President of the Royal Institute of British Architects. Those who desire to obtain photographs of the Newgate prison and its surroundings should now lose no time in securing them, as they will very shortly be pulled down. The buildings do not, it is true, make very artistic pictures, but, although not ancient, they have great historical interest, for some of the greatest criminals of modern times have been confined, tried, and executed within their precincts. A few years hence, when the buildings have vanished, photographs of them will be interesting, and still more so to future generations. There are but few photographs now of the old Temple Bar, but they are very interesting to those of the rising generation who take an interest in historic buildings, though it was only cleared away a comparatively few years ago. So it will be with Newgate and its surroundings in the next generation.

* * *

We have frequently referred to photography as a witness in Courts of Law, but we do not remember a case in which it was employed as it was some days ago at the West London Police Court. Four well-known firms, brewers, torpedo-boat builders, soap-makers, and dyers, were summoned for permitting smoke, causing a nuisance, to issue from their chimneys. The Clerk to the Chiswick Council, in supporting the summonses, produced photographs showing the position of the chimneys and the smoke issuing from them. These photographs evidently had great weight with the magistrate, for he is reported to have said, while looking at one, that the chimney had been "caught in the very act." In one of the cases the magistrate asked the manager of one of the works what he had to say to "those silent witnesses." In the end, three of the firms were fined, on the two summonses, each five pounds, with ten shillings costs, to include the expense of the photographs, the magistrate stating that they were necessary witnesses. In the fourth case it was contended that the chimney shown in the photograph, and emitting a quantity of black smoke, did

not belong to the firm summoned, and, on a technical objection as well, this summons was adjourned. We all know that it is within the scope of a skilful photographer, in a case of this sort, to emphasise the smoke issuing from chimneys by minimising the exposure of the negative; or, on the other hand, to ameliorate it by a full, or over, exposure. Still, in any case, photography will prove that smoke, more or less a nuisance, may be issuing from the chimney shaft—another application of commercial photography.

* * *

THOSE of our readers, doubtless the majority, who are satisfied that January 1 next marks the beginning of a new century may be interested to learn, on the authority of a contemporary writer, that "the first people to live in the twentieth century will be the Friendly Islanders, for the date line, as it may be called, lies in the Pacific Ocean just to the east of their group. At that time, although it will be already Tuesday to them, all the rest of the world will be enjoying some phase of Monday the last day of the nineteenth century" (December 31, 1900) "At Melbourne the people will be going to bed, for it will be nearly ten o'clock; at Manila it will be two hours earlier in the evening; at Calcutta the English residents will be sitting at their Monday afternoon dinner, for it will be about six o'clock; and in London, 'Big Ben,' in the House of Commons will be striking the hour of noon. In Boston, New York, and Washington half the people will be eating breakfast on Monday morning, while Chicago will be barely conscious of the dawn. At the same moment San Francisco will be in the deepest sleep of what is popularly called Sunday night, though really the early dark hours of Monday morning, and half the Pacific will be wrapped in the darkness of the same morning hour, which become earlier to the west, until at Midway or Brook Island it will be but a few minutes past midnight of Sunday night."

* * *

THE Royal Meteorological Society celebrated its jubilee on day last week, when the new President, Mr. C. Theodor Williams, read the address of the late President, Mr. G. J. Symons, written shortly before his death, supplementing it by an address by himself. In it he mentioned the history of the Society, and the work it had accomplished, and made special reference to the large number of photographs of lightning the Society had accumulated. On more than one occasion we have commented upon the value that the daily forecasts of the weather, as issued from the Meteorological Office, would be to photographers, if they were reliable or even fairly more reliable than they usually are. We have before now said that if the weather forecasting for different districts were entrusted to boatmen, farmers, and the like, we should get more reliable forecasts than we now get from the Meteorological Office. Evidently the *Standard* is of a similar opinion to ours, for, in a leading article on the jubilee of the Royal Meteorological Society, it says that "many a shrewd country labourer or Alpine guide can forecast weather for local purposes even better than a Meteorological Office." This opinion entirely coincides with ours, and, it being the case, one may well ask why such aid is not invoked. It would not absorb much of the fifteen to twenty thousand pounds which the Meteorological Department annually receives. What the public—and more particularly, photographers, farmers, and others whose work is largely dependent upon the weather—want to know

s, not what, theoretically, we ought to have, but what we shall have, notwithstanding the sources from which the information is obtained.

* * *

THE ancient house facing Chancery Lane, in Fleet-street, is to be saved to London, though only by the "skin of the teeth." When the adjourned report of the General Purposes Committee of the L.C.C. came before the meeting last week, which was that the freehold of the old house, No. 17, Fleet-street, that was alleged to have been the Palace of Henry VIII. and Cardinal Wolsey, though it was really built in the reign of James I., should be acquired, an amendment was proposed that the report be referred back. The mover of the amendment is evidently no great very admirer of ancient buildings, however fine or historical they may be, for in his speech he is reported to have characterised this as a "rabbit hutch," and said it would be a wicked and wanton waste of public money if it were spent in that way. When the amendment was put to the vote, there were fifty for it and fifty-one against it, a majority of one only. The opposition to the Committee's recommendation then proposed other amendments, which, we are pleased to say, were one after the other defeated. On the original motion being put to the vote, it was defeated on a show of hands, but, on a division being called, it was carried by sixty against fifty, or by a majority of ten. Thus this interesting old house, the only relict of old Fleet-street, so beautifully described by Sir Walter Scott, is to be saved, but by a near "squeak" only, from the vandalism of a large proportion of the London County Council.

THE NATIONAL PORTRAIT GALLERY FROM A PHOTOGRAPHIC STANDPOINT.

At the back of Trafalgar-square, opposite St. Martin's Church, stands the comparatively little-known National Portrait Gallery, which possesses a valuable collection of oils, water colours, engravings, crayon sketches and miniatures of British notabilities, from which photographers should be able to obtain many useful hints. It is always interesting to compare the best portrait work of the artist of the brush with that of his brother of the camera, and to notice the merits and limitations of each. The principal advantages that Art (in the painter's sense of the word) seems to possess are its power of giving us colour and colour values, and its ability to idealise, to pick and choose, rejecting bad points and retaining good, to say nothing of its greater obedience to the creative power of the artist. Granting all this, however, there still remain some things in which photography is superior, as, for instance, in delicate beauty of detail and correctness of outline. The photographer is at his best when he takes to himself the lessons of the sister arts, and learns to make the mechanical subservient to the beautiful.

Let us take a few of the paintings in this Gallery and see what instruction they may have for us. One of the first to attract our attention is an excellent portrait of the Duke of Cumberland by Reynolds. The average photographer would probably exclaim against the heaviness of the shadow side of the face; but notice the greater dignity and power thereby given to a rather weak and sensual countenance, also how the lack of detail in the dress and the dark, gloomy background serve to concentrate the attention with irresistible force on the face itself. We shall observe here and elsewhere how painters

give the features just as they are; there is an absence of any equivalent to our retouching, any attempt to soften down the unpalatable or to mollify lines and furrows, but we must remember that their power of giving the natural flesh tints allows more latitude in this respect.

Nearly opposite, Allan Ramsay's *George III.* demands our notice. The robes and drapery strike us, from a photographic point of view, as being rather stiff and wooden; we may allow ourselves a little satisfaction in the thought that the camera would have rendered them more flowingly. But consider the truly regal expression the artist has given to what, if we may believe the historians, was not a very majestic face. We, alas! can only take things as we find them, with very little ability to seize our subject's best and happiest traits.

In the next room, Sir William Allan's *Walter Scott at Abbotsford* compels our ungrudging admiration. Here photography must own itself fairly beaten, for it could never have given us that fine dark interior, coupled with such exquisite lighting of the face and figure. That delicate chiaroscuro with subtly hinted romance of colour is at present unattainable by us, whatever the future may have in store.

Then this portrait of the young Dickens by Maclise. We must admit at once that a photographer might spend a lifetime on his sitter, and yet fail to catch such a characteristic and illuminated expression. The very soul seems to be looking out from that face. Yes, the painter can give us his sitter's history, the photographer but the tale of a passing moment. And yet that evanescent and momentary glimpse of the man may be also satisfying and conclusive if the photographer have but sufficient tact and *savoir-faire*.

It is not only the individuality of the sitter that seems to receive more justice from the painter, but the artist himself apparently has greater scope for the exercise of his own fancy. In example of this, notice the long row of Victorian celebrities by Frederick Watts. The *ego* of the artist seems to breathe in every one of them, a soul full of poetry and love of the beautiful. The noble portrait of Tennyson is evidently one of a poet by a poet. We seem to hear the very lilt of "Maud" and "The Princess," to catch the mystic sadness of "In Memoriam," and the chivalry and self-sacrifice of "Idylls of the King," as we stand before it.

Then let us look on the thin, ascetic face of the same artist's *Cardinal Manning*. Cannot we see there history, environment, minutest idiosyncrasies shown forth that he who runs may read? Notice the value of the accessories and surroundings—the scarlet hood and skull-cap, the lace-fringed cotta, the pectoral cross. Observe the effect of the dominant colour, the princely red, a hint to us that we may perhaps make our prints in suitable pigments to obtain a special result. This face fascinates; the piercing, sorrow-laden eyes, the sunken cheeks, the thin, tightly compressed mouth, the commanding majesty of the expression.

The head of *Thomas Carlyle*, another of Watts' successes, may teach us a few lessons. Where is the photographer who would have dared to present this rugged, untamed bear as the artist has done, with all his gruffness and ill-humour so palpably plain, his shock-headedness and general untidiness all shown forth in their naked truth? And yet it is a picture that will live, a record valuable to posterity.

One very noticeable point in all the portraits by this artist is their breadth of treatment, and what we shall call great diffusion of focus. They may serve as a reminder to us that

the wealth of detail, in which some of us glory, is not always a gain, and that suppression and restraint have certain rewards of their own. We have, however, many in our ranks, nowadays, who preach and practise this doctrine, and whose work in portraiture might well be placed beside those just mentioned, and yet not lose so alarmingly by contrast.

A picture which ought not to be passed over is one of *Sir Richard Burton*, by Leighton. The effectiveness of a dark background is here strikingly illustrated, also the fact that the most natural and unaffected pose is generally the most striking. See how even a crumpled collar contributes its quota to heightening the success of the whole.

In comparing the works of earlier artists on the opposite side of this room, it is impressed upon us that, like photography, British Art has greatly improved since its beginnings. The technique and force of the latter portraits are far superior. There is a certain daubiness and vulgarity visible in the former productions that is sometimes quite painful. In the adjoining corridor we shall not fail to notice the splendid life-size portrait of *Sir James Hope Grant*, by his brother. There are various photographic possibilities here suggested that will not be lost upon the observer. There are also several fine works by Sir Thomas Lawrence, and the Count D'Orsay's *Duke of Wellington*. In the next room to this is a magnificent three-quarter length of *Charles Darwin*, by the Hon. John Collier. The masterly lighting and rendering of this massive, furrowed, silver-bearded head is well worth attentive study.

A matter on which, from our standpoint, a little self-congratulation may perhaps be excusable, is that of frames. It is doubtful whether, whatever time-honoured custom may dictate, gilt frames are really the most suitable for oil paintings. Be this as it may, there is no question that photographers have a far greater range of choice, and a better chance of getting an harmonious setting for our pictures; and, although, on the whole, the frames here exhibited are in good taste, yet in a good many cases they are glaringly unsuitable, though, no doubt, the artists were not to blame. Yes, we certainly see these things better managed at the Royal and the Salon.

It is interesting to examine the colours employed in these pictures, as far as they can be ascertained, as to their permanency or otherwise; by this means useful data will sometimes be obtained. Our spotting tint, for instance, will often become quite different and objectionably apparent after a short time, a nuisance which might have been avoided if more lasting pigments had been employed; in carbon printing also the wisdom of a similar selection is evident.

Needless to say, only a tithe of the pictures in this instructive collection can be mentioned in the limits of a short article, but it should be said that there are a large number of portraits in crayon, water colour, &c., also an array of Early English works in the upper galleries.

It has occurred to some to wonder why cannot we photographers have a National Portrait Gallery of our own! The idea is worth ventilating. Permanently housed in a good central position, a representative collection of photographs of men and women of note, in the carbon or other lasting process, might become of great historical and technical value to coming students of our times, when the founders of it should have passed away. And, as it requires some self-denial to plan for the benefit of posterity only, let us consider how useful it would be as a kind of ever-present standard for us to judge and measure our work by.

Ammonia in Intensification.—The paper by Monsieur F. Lateur, which appears on another page, is of interest from the very direct bearing it has upon that much-used process of intensification, mercuric chloride followed by ammonia. Several conflicting statements have been made as to the composition of the black product left on treating the mercurially bleached silver image by ammonia. M. Lateur's experiments, although not made with a view to the solution of a photographic problem but of an analytico-chemical one, do certainly show that, even after treatment with a much stronger solution of ammonia than ever used by photographers as a "blackening" reagent (Lateur's solution contains nearly ten per cent. of real ammonia, NH_3 , i.e., about thirty per cent. of liquor ammonia ('880), a considerable proportion of the silver chloride is left in association with the mercury. The proportion separated by the ammonia indicates that a compound of mercury and silver exists, as suggested by Mr. Chapman Jones in his paper, "On the Product of the Action of Mercuric Chloride upon Metallic Silver," which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1894, p. 183.

A Laminated Photographic Image.—M. A. Trillat has contributed a paper to the *Comptes Rendus de l'Académie des Sciences*, describing the means by which he has succeeded in converting the reduced silver of a negative into a laminated condition. The object of this transformation was to ascertain if phenomena of colour interference would result. In the first place it was necessary to dissolve the image without removing any silver from the film, and for this purpose solutions were unsuitable. However, by exposing the plate to the fumes of nitric acid, after cleaning, polishing, and hardening the film, the image was obliterated. The film became quite transparent, and the silver deposit appeared to be changed into a colloidal condition. It is necessary to well polish and harden the film, otherwise the result will be inverted and yield a positive instead of a negative, also the colours will be iridescent instead of localised. To produce the laminated image, the plate is placed in a suitable receptacle and subjected to a current of sulphuretted hydrogen. The image speedily reappears with bright metallic lustre, and in vivid tints, but the action must not be carried too far, otherwise the colours lose their strength and become diffused. A negative treated in this way gives a bright, polychromatic image when examined by reflected light, and, if looked at through the glass, the colours are often complementary. The colours are not amenable to change by treatment, but moisture causes transitive variations. Generally there is no relation between the colour of the image and the object, but it seems to vary according to the density of the deposit. It therefore seems possible that the colours may be localised according to the thickness of the film, which might be made to correspond with the colours of the object.

An Automatic Actinometer.—*The Photo Journal* gives a report of a paper read by M. P. Donse, at a meeting of the Rouen Photo Club, describing an actinometric balance. It is an adaptation of an instrument made by Bellain in 1834. A tube, with a bulb at each end bent downwards, forms the beam of the balance. One of the bulbs is filled with ether, and the tube exhausted and hermetically sealed. As the slightest variation of temperature between both ends of the tube will cause distillation, if one arm be covered with black varnish, a thermic actinometer is formed, which may be used in the same manner as a pair of scales. Adjust the tube at equilibrium upon a pivot, and affix a long pointer to the tube at the point of suspension. This may be provided with a scale for reading the deviations of the balance. When the instrument is brought into the light, a variation of temperature will be caused between both ends of the tube. The ether will pass gradually by distillation from one bulb to the other and deflect the pointer. By means of the scale the quantity of light action may be definitely ascertained. An electric attachment may be fitted to ring a bell, or close a shutter, as soon as a given exposure has been made, and the instrument may thus be adapted to carbon printing or many other purposes.

Colour Screens.—*The Photographiche Chronik* devotes an article to the correction of the blue filter for three-colour work, which usually transmits the ultra-violet rays in addition. Although the lens and the glass of the colour screen cut off a portion of the ultra-violet rays, there is generally a residuum of sufficient importance, to affect the result and give undue prominence to the blue in the final print. An aqueous solution of aeskulin is recommended as the most suitable means of correcting the blue filter. If the latter consists of a solution of methyl violet and basic cupric ammonium carbonate, it will not only transmit the blue, but also the violet, and a large portion of the ultra-violet rays. If a small quantity of aeskulin be added, the light between G and H of the spectrum will be cut off. A plain solution of aeskulin in water, although it has only a slight yellow tinge, is of great value as a screen for orthochromatic plates when used for landscapes, and it prolongs the exposure by only one-third or one-half. The solution will not keep for a lengthened time, and acquires a deeper yellow colour, even if kept in a stoppered glass cell. It is therefore desirable to prepare it by substituting alcohol for one-third of the water, and adding a few drops of a solution of sulphite of soda. The solution will then keep from five to eight days. It is also preferable not to add the aeskulin solution to the blue filter, but to use it in a glass cell, placed in front of the latter. When exposing for the other colours, the cell should be emptied and filled with water only.

Tele-photography.—A prize is offered for the best telephoto lens of 60 to 100 cm. focus, suitable for balloon photography. The competition is open to opticians of all nationalities, and full particulars may be obtained by application to Lieut.-Colonel Renard, Director of the Central Military Aeronautic Station, Chalais-Meudon, Seine et Oise.

Aluminium.—The *Deutsche Photographen Zeitung* gives some interesting statistics concerning the price and production of aluminium. Fifty years ago the metal could only be obtained by a tedious process in the chemist's laboratory, but, thanks to the intense heat of the electrical furnace, its production has now become a large commercial industry. In 1855 the entire output of aluminium was only 1300 kilos, but in 1898 the production had risen to 4,000,000 kilos. Of this quantity the United States alone produced 2,500,000 kilos. In 1855 the price was 50*l.* per kilo, but in 1856 it fell to 15*l.* From 1856 to 1886 the price was 5*l.*, but in the latter year it fell to 3*l.* 10*s.* In 1890 it stood at 15*s.*; 1891, 12*s.*; 1892, 4*s.* 9*d.*; 1894, 4*s.*; 1895, 3*s.* 2*d.*; 1897, 2*s.* 7*d.*; 1898, 2*s.* 1*d.* At the present time aluminium may be bought at 2*s.* per kilo, and it seems probable that a further reduction in price will take place.

The Temperature of the Sun.—According to the *Wiener Freie Photographen Zeitung*, fresh calculations have recently been made as to the temperature of the sun. From time to time extraordinary statements have been made, and the prevalent idea twenty to thirty years ago was that the heat of the sun must be estimated at some millions of degrees. The more accurate measurements of recent years have placed the estimate at much lower figures, but these have varied between 2000° and 70,000° C. The diversity of opinion is attributable to the uncertainty of our knowledge of the absorption of heat by the atmosphere of the earth, and likewise as to the variation in radiation dependent upon the temperature of a hot body. Stefan's law of radiation has been found the most reliable, and Professor Lummer's experiments show that it is correct up to a temperature of 1500° C. Upon this assumption Professor Warburg, of the Physical Institute, Berlin, calculates that the temperature of the sun is 6249° C., and it follows that, if we wish to learn under what conditions various substances exist in the sun, we must first produce such a temperature by artificial means.

Pyrogallol and Oxygen.—*The Photographiche Chronik* publishes a short note on the action of oxygen upon pyrogallol. If caustic potash or soda be mixed with a solution of pyrogallol, to

which a preservative has not been added, each atom of pyrogallol will absorb three atoms of oxygen. If ammonia be added, four atoms of oxygen will be absorbed, but the reaction, although rapid at first, will slow down considerably. The dark brown substance thus obtained will represent eighty-five per cent. of the original quantity of pyrogallol. It is soluble in water, and its formula is probably $C_{20}H_{20}O_{16}$. Dioxide of carbon is formed in the process, and unites with the excess of alkali. In the first stage of the oxidation a substance is formed resembling purpurogallin; it is red, crystallisable, and soluble in ether. Its composition is $C_{20}H_{20}O_{11}$. When the reaction is complete, the product represents about ten per cent. of the original quantity of pyrogallol. Its formula is $C_{16}H_{16}O_{12}$, and it is soluble in ether also. It is only possible to ascertain by exhaustive experiments which of these two products is formed in the film in the process of development with pyrogallol.

A CONVENIENT FORM OF DRY PYRO DEVELOPER FOR TRAVELLING, &c.

PROCURE four tins of equal and any desired size. One is for dry pyro, the second for powdered dried carbonate of soda, the third for dried sulphite of soda, and the fourth for a bottle of bromide of potash solution.

To prepare 100 cubic centimetres of developer according to the Ilford formula, dissolve in 100 c. c. of water 2 grammes of the dry soda, $2\frac{1}{2}$ grammes of dry sulphite, $\frac{1}{2}$ gramme of pyro for soft, up to 1 gramme for dense negatives, and add 1 c. c. (20 drops) of bromide of potash solution containing 11·4 grammes in 100 c. cm. This gives the Ilford concentration, except that, more exactly, one should add $1\frac{1}{2}$ to $1\frac{1}{4}$ gramme of pyro. If one further substitutes a ten per cent. solution of bromide, one has a formula exceedingly simple in the proportions of the ingredients. The formula is calculated on the assumption that crystallised soda and sulphite contain forty per cent. and fifty per cent. respectively of anhydrous sodium carbonate and sulphite. If the two latter be thoroughly dried and sifted through a fine sieve, the former will dissolve in less than a minute with constant stirring, the latter in ten seconds. The pyro dissolves instantly. If the salts are at all moist, they will form lumps which dissolve more slowly; this may be avoided by first mixing them on a piece of paper.

Anhydrous sodium carbonate can be prepared from soda crystals by drying them in the oven, and there is no danger of overheating them. The anhydrous sulphite may also be prepared by drying sulphite crystals, although the sulphite will thereby be more or less oxidised to sulphate. A slight oxidation does no harm. Sulphite oxidises continuously when not kept air-tight, whether in solution, or in the form of crystals or dried salt; of these the last is the most permanent. Commercial sulphite always contains sulphate of soda, according to Dr. Andresen, sometimes twenty-five per cent., and up to ten per cent. of the more harmful hyposulphite, which may be the cause of the observed difference in the energy of developing solutions made with different makes of pyrogallic acid. It is therefore well to buy the sulphite ready dried, and of a responsible dealer.

A tin $1\frac{1}{2}$ inches in diameter by 3 inches in height will hold 15 grammes (half an ounce) of pyro, and somewhat more than a proportionate amount of the other substances, giving 3 quarts of normal developer. The solids can be measured out with more than sufficient accuracy, after a little preliminary practice in weighing a series of measured portions. For measuring one can use a horn or wooden salt or mustard spoon, or a glass or metal spatula. The sulphite and carbonate of soda may be mixed together, and measured out in a pistol cartridge to which a handle has been soldered. Hard rubber boxes make a neat substitute for tins, and a hard rubber bottle for the glass bottle and case. With the addition of a celluloid measuring "glass," three or four xylonite trays, and a package of acid fixing salt in cartridges, blocks, or tablets, one has a compact and non-breakable developing outfit. For printing, a tin of platinum paper, another of oxalate of potash, and a hard rubber bottle for hydrochloric acid are much more satisfactory than bromide paper if one can get sunlight.

E. Merck, manufacturing chemist, in Darmstadt, Germany, sells dried sulphite and carbonate of soda at 6*d.* to 7*d.* a pound, and hard rubber bottles, and has lately introduced a very convenient form of acid fixing salt in tablets of $2\frac{1}{2}$ grammes each, at 1*s.* 4*d.* a pound.

This developer is less expensive than that in tablet form, and it

enables one to easily alter the proportions of the ingredients. Moreover, one avoids thereby the bother of crushing tablets to a powder, and the trial to one's patience in bringing the larger bits into solution.

W. S. DAVENPORT.

A CINEMATOGRAPHIC FEAT.

A CYNIC once made the sapient remark that he did not care to undertake a certain work which he was told would be of benefit to posterity, on the ground that posterity had never done anything for *him*. This man was certainly not a maker of "animated photographs," as they are called, for such pictures will, we may assume, be of infinite value to the generations yet unborn. Every public event, and more especially those in which Royalty takes part, has its attendant cinematographers, who vie with one another in alertness, both in securing their pictures and bringing them before public criticism with as little delay as possible. The interesting ceremony in which our beloved Queen took part last week in Dublin was no exception to the rule, and every movement of every person who was there was faithfully recorded by the busy lens. There was much in this ceremonial which had about it a pleasant quaintness of mediæval flavour, and it was therefore more picturesque in character than most functions of the kind. The cinematographer had, for this reason, more scope for his work, and one of them who was present, and who was fortunate enough, by the courtesy of the Lord Mayor, to obtain the unique privilege of a reserved "pitch" on the Corporation stand, has had no reason to regret his journey to Dublin and back. This was Mr. Ceci Hepworth, who secured in his camera not only a fine film of the ceremony itself, but also obtained splendid pictures showing the whole of the procession, and studies of the enormous crowd, mad with loyalty, and full of expression and movement. This entire series of cinematograph pictures has a length of 325 feet—that is, nearly seven times the usual length of such films. It is noteworthy that, on the evening of the same day upon which the negatives were taken, they were travelling to London. Early on Thursday morning they were developed at the factory at Walton-on-Thames, and on the same evening, at eight o'clock, they were exhibited to a delighted and enthusiastic audience at the London Hippodrome. When we consider the great length of this film, comprising no fewer than 5200 pictures, and remember that the negative had to be developed, fixed, and dried, and that positives from it had to go through the same operations, we must consider this a very creditable photographic feat. Positive copies of this unique film were sent the same evening by post to Dublin and other chief cities, so that the loyal inhabitants of Britain were able to follow the movements of their Queen in the Emerald Isle very shortly after the chief ceremonial connected with her visit there had closed.

EXPOSURE AND DEVELOPMENT.

II.

WE come now by natural sequence to consider the latest method of determining the actinic value of light, and the simple consequent operations required for the rapid solution of our problem of correct exposure, with some pretensions to scientific accuracy.

One of the earliest, if not actually the first, light-measuring instrument for the purpose of determining negative exposures was the Watkins meter, although long prior to its advent actinometers were in constant use for carbon printing, &c. This instrument, especially in its latest form, may be relied on for deciding at any time of the day, by means of a strip of sensitised paper, the comparative actinic value of the light. By using a series of scales engraved on the instrument, it is not difficult to determine with remarkable accuracy the correct exposure with a given plate and aperture of lens. A more detailed description of this instrument seems unnecessary, especially for beginners, as an equally ingenious instrument, known as Wynne's exposure meter, can now be obtained at about half the cost of the Watkins meter. The Wynne meter is so handy that it may be carried at all times without inconvenience, and will be found of such real service that its cost will soon be repaid by the saving in plates alone.

If you have now been led to make fairly accurate exposures of your plates, we may transfer our thoughts to the dark room, and consider the necessary arrangements for, and the operations connected with, the second section of our lecture.

It is taken for granted that every beginner makes use of an exposure note-book, not necessarily one of the orthodox ones with columns ruled therein for noting lens, stop, plate, time of day, &c., but at least one in which is noted such information as will assist in the intelligent development of the plate. For instance, the nature of the subject, conditions of light, whether strong contrasts exist, and whether over or under-

exposure is known or suspected, will be found of value for reference in the dark room when about to develop the plates.

The dark room itself might with advantage be considered in some detail; but, bearing in mind the extremely varied accommodation, or want of it, that most amateurs have to be content with, the task seems hopeless. A few words of advice on the subject generally may, however, be of service. The dark room, whether temporary or permanent, should be reduced to something like order, so that the materials and apparatus needful for the operation of development may be made conveniently accessible. That measures, dishes, &c., should be scrupulously clean goes without saying.

For the beginner the question of the best developer is a comparatively simple one. Our choice should naturally be the formula advised by the maker of the plates, to the exclusion of all others. A thorough acquaintance with it will pave the way for possibly useful changes later on. In the mean time, the earnest student of photography, and especially that part dealing with the development of the latent image, will find that, by varying the proportions of the ingredients composing his adopted developer, remarkable variety and certainty of results are possible. This point can hardly be too strongly emphasised; the acquirement of the greatest skill and accuracy in making exposures may be utterly nullified by errors in development, which are almost inevitable when many developers are tried and not one of them thoroughly mastered in all its possible variations.

The beginner will do well to commence, from the first, by purchasing the necessary chemicals and making up his own solutions. This will give him a definite knowledge of what they contain; for instance, he will know—and, if he is wise, he will write upon the labels of the respective bottles—how many grains of pyro his solution contains per ounce, how many grains of soda per ounce of fluid, and how many minimis of bromide solution contain one grain of the restrainer. Similarly, of course, if other chemicals are used.

In order that we may take full advantage of the knowledge we have already gained in exposing our plates, it is essential that the photographer should know, at least in a general way, the function that each of the ingredients composing his developer has to perform. Let us assume that the old and well-tried pyrogallic acid has been selected as the reducing agent. Alone this chemical has practically no reducing power, but, in conjunction with an alkali, it serves to reduce the practically invisible salts of silver, after exposure to actinic light, to the metallic condition. Other things being unchanged, the greater the proportion of pyro the greater will be the power of reduction or density-giving capacity of the developer, if its action be permitted for a sufficient length of time. Beyond a certain proportion, however, say of five or six grains per ounce of fluid, no useful effect will be observed, but, on the contrary, the surplus is liable to be detrimental by becoming oxidised and staining the film.

This latter defect may, however, be obviated somewhat by the use of a large quantity of a preservative chemical; but the remedy is in turn apt to produce undesirable results, such as rendering the developer perceptibly slower in the case of sulphite of soda, and in causing frilling, or a partial separation of the film from the glass, in the case of acid preservatives.

The action of the alkali may be taken (without entering into the exact chemical changes which occur), to lead to the more or less rapid production of the visible image, that is to say, that development may be carried on very slowly by the use of very small quantities of alkali, or it may be hastened by larger quantities.

The addition of a moderate quantity of a third ingredient, bromide of potassium, is often necessary for the purpose of retarding the appearance of the image, until it is possible to determine whether the plate has had a fairly accurate exposure, and with some makes of plates to prevent a general veiling, or fogging, of the negative.

To resume, briefly, we find the functions of the ingredients of our developer to be:—

Pyro=reducing power or density giving.

Alkali=rapidity of action or detail giving.

Bromide=controlling action.

Water=diluent, tending to softness.

Let us now consider how best to utilise these varied powers in the production of a good negative. An analysis of a large number of formulæ shows the average quantity of pyro, carbonate of soda, bromide of potassium, and sulphite of soda, to be 3 grains, 24 grains, one-third of a grain, and 24 grains respectively per ounce of developer.

In making use of the formulæ given by the plate-makers, it should be borne in mind that they are probably intended for use in the portrait studio, by professional photographers, to whom the time spent in development is a very important consideration. They therefore contain a larger amount of alkali than is necessary for amateurs to use when dealing with landscape or other subjects by tentative methods. Probably two-thirds the amount just given would prove more satisfactory in the beginner's hands, so that the quantity per ounce of developer would be 16 grains instead of 24. The figures thus modified may, for our present purpose, be called the normal quantities.

We will now proceed to develop a rapid plate, which, we will assume has received a correct exposure. It has been already stated that the rapid plate has rather a tendency to give softness on a thin negative; we

therefore decide that our developer may contain the normal quantity of pyro or density-giving agent. With the alkali we must be more cautious, and at the beginning put in only one-fourth, or less, of the normal quantity. To still further keep the plate under control we add, say, half the normal quantity of bromide and begin development.

At this point we may advise that the quantity of solution used should be rather on the liberal side, so that it may not approach exhaustion before the image is completely developed.

The solution should also be applied in such a way as to cover the plate quickly, since any delay in covering parts of the film may be expected to lead to very annoying markings on the negative.

A very good plan for ensuring the greatest possible freedom from air bubbles and pinholes is to have a flat camel's-hair brush standing handy in a jug or glass of water. With this brush the developer, immediately after application, is gently brushed backwards and forwards a few times over the whole surface of the plate. This has been found a most effective substitute for dusting the plate prior to pouring on the developer.

As development proceeds under the action of the above-mentioned solution, we shall find that the image shows first in outline, and follows with a fair proportion of detail. If further progress seems to be in the direction of too great density, additions of alkali may be made up to, or lightly in excess of, the normal quantity. If these various stages have been carefully watched and conducted, a thoroughly satisfactory negative should be the result.

We may now consider how our procedure should be varied in dealing with a slow plate assumed to be correctly exposed. Bearing in mind the fact that the slow plate tends rather to vigour or harshness under the influence of the average developer, we shall, in this case, be careful to start development with not more than half a grain of pyro per ounce of solution, the other constituents remaining normal.

The first appearance of the image should be somewhat similar to that of the rapid plate, followed by an inclination to full detail with hardly sufficient density. We may now add another half grain of pyro, and shall probably be able to complete our negative without further modification, unless we require a very vigorous one.

In cases where the exposure is unknown or uncertain, it is better to adopt what is known as tentative development. This practically means that over-exposure is assumed to be possible, and the plate treated accordingly. We therefore mix our developer with the normal amount of pyro, say double the usual bromide, and not more than one-tenth the normal alkali.

If the exposure turns out to be fairly correct, the latter may be increased from time to time as needed, and, in the case of rapid plates, it will be the only modification required. With slow plates, however, it may also be necessary to dilute the developer in order to avoid over-density in the high lights.

We now approach the most difficult and unsatisfactory part of our subject, that is to say, the procedure to be adopted in cases of over and under-exposure.

To deal fully with this alone would occupy more than a single evening, with the probable result that our ideas on the subject would be obscured by the mass of evidence in favour of, and opposed to, various methods of treatment.

We had better, therefore, get some idea of the earliest symptoms of over and under-exposure during development in cases where their existence is not already known, and then refer briefly to simple general methods of treatment, leaving the more profound study of the subject, including the use of special developers or combinations of the newer developing agents until we become expert in the use of our chosen developer.

In cases of great over-exposure we may expect to find the entire exposed surface of the plate begin to darken, with practically no outline or contrasting parts. With less over-exposure the image may show a fair and promising outline for a second or two, succeeded by a general darkening as before.

We must therefore watch the earlier stages of development with the utmost care, until the gradual appearance of the high lights, one after another, informs us that no serious error in exposure has been made.

Should over-exposure be revealed, the developer should be poured off at once, and the plate flooded with two or three changes of water, or, preferably, washed under the tap, and then soaked for four or five minutes in a solution of about 10 grains of bromide of potassium per ounce of water. To this solution may then be added, from time to time, small quantity of developer containing the normal quantity of pyro, but not more than a quarter the normal amount of alkali. Development will proceed slowly, and patience must be exercised, even to the extent of thirty or forty minutes, if the best possible result is desired.

On this point Mr. Alfred Watkins says: "In any exposure, over or under, the contrast between any two tones that have a difference of deposit increases with length of development up to a certain limit, although with some plates (prone to fog) that limit is reached before maximum density in the high lights is attained. To obtain this maximum contrast with an over-exposed negative, the negative is very dense, and takes long to print. Most photographers stop the development of over-exposures long before maximum contrast is attained."

This statement indicates that we should carry the slow development

of over-exposed plates much beyond printing density, and rely on uniform reduction afterwards to give us a printable negative.

Before leaving the subject of over-exposure it may be well to point out that an over-exposed plate that has been partly developed with a normal developer will rarely produce so good a negative as if it had been treated for over-exposure from the beginning. This fact alone is a sufficient reason for taking the notes of exposure before referred to, and without which the beginner will find himself seriously and unnecessarily handicapped.

Under-exposure, so far as it is amenable to treatment, is a much simpler matter, inasmuch as the image has no tendency to appear with the almost incredible rapidity shown by some brands of plates when over-exposed. Our precautions and arrangements for treatment may therefore proceed in a more leisurely manner.

The first evidence of this defect will be the appearance of all the brighter parts of the subject in patches, which continue to gather density before there is any sign of the finer detail. Continued development with the same solution would merely accentuate the early indications, and ultimately lead to what is known as a soot-and-whitewash negative.

Our first operation will be to dilute the developer with an equal or greater quantity of water, and to add a little alkali. Increase of density should now be almost arrested, and further detail appear in the half-tone if the operator will patiently allow the modified developer time to act. Should there still remain a considerable area without detail, a further small addition of alkali may be made. At this point, however, the negative must be carefully watched, as veiling or general fog may be expected so soon as the solution contains the maximum amount of alkali that the plate will permit. Not the slightest advantage is to be expected by allowing the negative to remain in the developer when once veiling begins; on the contrary, a passable negative may be entirely ruined thereby.

Although rarely taken into full consideration, except as a matter of personal comfort, the temperature of the dark room, as affecting the developing solutions therein at the time of use, plays an important part in the production of a negative, and it may exercise a harmful influence if ignored, or it may be made to act beneficially if its effect be rightly understood. It appears that the temperature of development affects the result in two ways: first, the latent image itself is supposed to vary with variations in temperature; and, second, the chemical reactions of development are accelerated or retarded by a rise or fall in temperature. For practical purposes we may look upon the effects of heat as equivalent to increase of exposure, and therefore use warm developer for under-exposed plates and cold developer with over-exposure.

Thus, in cold weather, we may get an appearance of under-exposure, and the opposite in warm weather.

It must be remembered, however, that there is a danger of softening and melting the film if the temperature is raised much above 70°.

Although the succeeding treatment of the negative does not properly form part of the present lecture, a few words thereon may not be amiss.

It is well known that the film of the negative, when removed from the developing solution, retains in the gelatine an appreciable quantity of the chemicals employed, so that the negative should be well washed without delay, or further action will take place. When washed, the negative may remain in water without injury, if it is desired to develop a number of plates, before proceeding to fix them.

This latter operation is a most important one, and every negative should be allowed to remain in the hypo bath at least ten minutes after the last trace of unreduced silver has disappeared from the back. Neglect of this precaution may be expected to lead to a yellowing and fading of the image in the course of a few months.

Washing after fixing should be thorough; and with the final rinse, prior to drying, the film should be gently rubbed all over with a pledget of wet cotton-wool, or brushed with a soft flat brush, under water. This will remove any small particles of dirt that may have settled on the film during the previous operations.

Such a simple operation as drying the negative would appear to offer no possible opening for further trouble. It is, however, a fact, that one of the most annoying defects, known as drying marks, may be brought about by a want of care or a knowledge of how to avoid them. Marks may be expected if drops of moisture are allowed to form on the film, instead of draining away uniformly over the whole surface. The remedy is, either to remove the drops with the corner of a piece of blotting-paper, or to gently wipe the whole surface of the film with a pad made of an old linen handkerchief, before putting the plate in a rack or standing it up to dry.

Another constant source of markings is an appreciable change of temperature when the film is partly dry, or a change from a quiet to a distinctly draughty situation, or vice versa.

Finally, a negative that is worth keeping is worth varnishing; the neglect of this precaution has caused the ruin of many a negative by silver or other stains.

It will have been observed that this lecture contains no formulæ and no suggestions for variations in the compounding of Nos. 1, 2, and 3 solutions; for these the photographer is referred to one of the numerous text-books, or to the directions given by the plate-maker.

The object has been to direct attention to the intelligent and

systematic use of the materials and apparatus at our disposal, and to the earnest study of cause and effect, leading up, through exposure and development, to the confident and pleasurable practice of the art of photography.

G. F. BLACKMORE.

PHOTOGRAPHICALLY RECORDING OSCILLATING RAYS OF LIGHT.

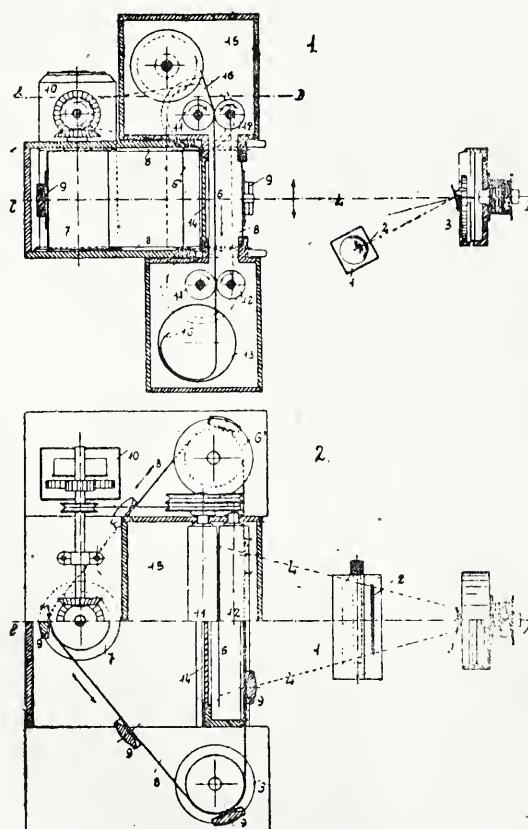
[Patent No. 22,613 of 1899.]

THE invention of Messrs. Anton Pollak, Gyula Egger, and Dr. Frederick Silberstein.

1 is a source of light of any suitable kind from which a group of light rays falls through a narrow elongated slit, 2, on to a concave mirror, 3. This concave mirror is connected with the movable body, the oscillations of which are to be recorded, in such a way that this mirror by reason of this connection executes oscillating movements on an axis which is parallel to the slit, 2, before mentioned. In the case shown in the drawing the mirror is connected with the diaphragm of a telephone, for instance, or a telegraphic receiver.

The oscillating movements of the concave mirror impart oscillating movements to the reflected light rays, 4, also, so that at the point, 5, an actual oscillating picture of the slit, 2, results, which is recorded by the devices hereinafter described.

An endless band, 8, is carried over rollers, 6, 6¹, and 7. This band, 8, is provided with openings at equal distances apart, in front of which



openings a cylindrical lens, 9, is fastened on the band in such a way that the geometrical axes of these cylindrical lenses, 9, stand at right angles to the direction of the movement.

The roller, 7, receives a rotary motion from a driving mechanism, such for instance as a clockwork, 10, so that the band, 8, is moved forward in the direction indicated by the arrow. The cylindrical lens for the time being between the two rollers, 6 and 6¹, allows separate parts of the group, 4, of reflected rays to pass through the lens as it moves from the roller, 6, to the roller, 6¹. The focal distance of the cylindrical lens, 9, is so calculated that the part of the light rays, 4, which is absorbed by the lens, is also concentrated at 5 into an intense point of light. An endless sensitive strip of paper is slowly moved forward by means of rollers, 11 and 12, in the direction indicated by the arrow in such a way that the said intense point of light falls on the sensitive strip.

Of course, care must be taken that the sensitive paper is entirely excluded from all foreign light in a box, 15, which perfectly excludes light, and it is collected after the exposure in a receiver, 13, from which the light is also excluded.

A red observation glass, 14, may be arranged in the box, 15, behind the paper strip in order that the oscillations of the point of light during the exposure may be inspected.

The distance of the separate lenses, 9, on the endless band, 8, is exactly as great, or somewhat smaller, than the width of the sensitive strip, 16.

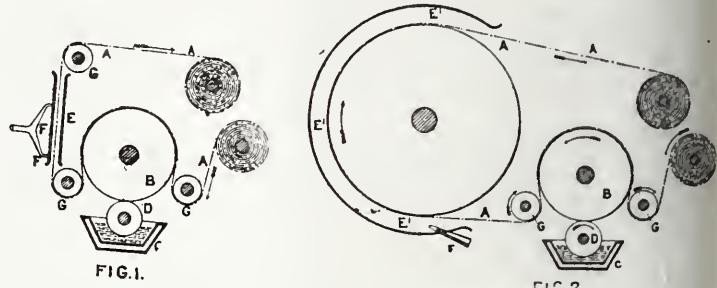
The working of the whole apparatus is as follows:

For the purpose of recording the oscillating ray of light, 4, the driving mechanism, which moves forward the endless band, 8, and the strip, 16 in the direction indicated, is started. The optical arrangements herein before described produces on the sensitive paper a sharp point of light which, in consequence of the oscillations of the mirror, 3, oscillates in a vertical direction, but, in consequence of the movement of the cylindrical lenses, 9, executes a continuous horizontal movement. As soon as one lens, 9, has passed in front of the sensitive strip, 16, or somewhat before that time, the following lens comes into action and conveys the oscillating point of light again transversely over the paper strip, 16. As, however, in the mean time, the sensitive strip, 16, has also moved a given distance in a direction at right angles to the direction of movement of the endless band, 8, the following oscillation curve will encounter the sensitive strip at a distance from the previous curve of oscillation corresponding to the difference in the movement executed. The developing and fixing of the exposed sensitive strip takes place in the ordinary manner.

COATING SENSITIVE FILMS, PAPERS, &c.

[Patent No. 5793 of 1899.]

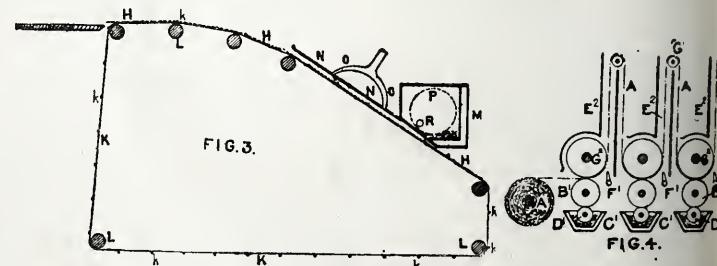
THE invention of Mr. J. E. Thornton. For coating a sensitive emulsion upon a support of thin, flexible material, A, such as paper, celluloid, or other web material, a machine is constructed with a roller, B, to apply the emulsion to the film, A, a jacketed or heated trough, C, a duct or roller, D, rotating in the trough to convey the emulsion to the coating roller, B, and enclosed chamber, E, through which the web support when coated, passes air ducts, F, through which heated air is forced and caused to impinge upon the travelling web support, A, and guide rollers



G, placed to conduct the material over the coating roller and through the drying chamber, E.

A straight drying chamber, E, as shown in fig. 1, or a curved or cylindrical drying chamber, E², as shown in fig. 2, may be employed.

For the coating of a stiff or rigid support, H, such as plates of glass, celluloid, mica, or the like, the machine is constructed with a travelling carrying band, K, passing over guide rollers, L, and provided with a number of transverse ribs, K, by which the plates, H, are held in position thereon. Above or in close proximity to the travelling carrier band, K, is placed the trough or box, M, for containing the emulsion, and over the travelling carrier band, K, is formed the drying chamber, N, with the



air ducts, O through which the heated air is forced upon the coated plates as they are carried through.

In the emulsion box or trough, M, is placed a revolving silver gauze cylinder, P which rotates in the emulsion, and inside the gauze cylinder is placed a flat air tube or nozzle, R, the width of the plates, through which a blast of air is forced. In the side of the trough or box, M, opposite the air tube, a slit is formed, through which the emulsion adhering to the silver gauze of the cylinder, P, is blown in a fine spray on to the plates, H, carried by the travelling carrier band, K.

An exceedingly fine layer or coating of the emulsion is deposited on the support, A or H, and dried as such pass through the machine, and

the process is repeated and again until the finished coating of the sensitive emulsion is the desired thickness. It will be necessary in this manner to apply about from ten to twenty coats to obtain a thickness equal to that usually applied at the one operation.

The paper or flexible film support may be reeled as shown after each coat, and passed repeatedly through the apparatus or a number of coating rollers, and drying chambers or cylinders may be arranged in one machine (see fig. 4), so that the support may be fully coated with the requisite number of fine coats at one operation.

In fig. 4 the apparatus is made up of any number of sections, comprising a coating roller, b^1 , trough, c^1 , ductor roller, d^1 , to apply the emulsion to the coating-roller drying chamber, e^2 , into which the heated blast of air is injected by the nozzle on the perforated pipe, r^1 , and guide rollers, g^1 and g^2 , the roller, g^2 , may be heated if desired. Likewise a number of spraying apparatus may be used for plates.

THE ACTION OF AMMONIA ON A MIXTURE OF MERCURIC AND SILVER CHLORIDES.

[From *Comptes Rendus*.]

In order to detect the existence of silver in presence of a mercurous salt, different treatises on chemical analysis direct the treatment of the mixed chlorides of mercury and silver with ammonia. The mercurous chloride is thus converted into amido-mercurous chloride, Hg_2ClNH_2 , and the silver chloride passes into solution. This simple process succeeds when this latter body is present in notable quantity in the mixture, but otherwise it is unsatisfactory, the mercurous compound retaining the whole of the silver chloride. It therefore struck me that some few experiments on this phenomenon would not be without interest. The following experiments were made.

Equal weights of a precipitate, containing the mixture of the chlorides in a known proportion, were successively digested three times with aqueous ammonia of specific gravity .960. Each digestion lasted ten minutes, during which time the mixture was frequently agitated. The residual silver chloride was determined in the precipitate remaining after each digestion.

The quantities of chlorides employed in each series of experiments was obtained by mixing solutions of the salts of such strength as to give exactly .0478 grammes of mercurous chloride and .0483 grammes of silver chloride per cubic centimetre.

In each experiment the total weight of the chlorides was about one gramme, and the volume of ammonia used for each digestion about 30 c.c.

The following table gives the results obtained :—

Total weight of chlorides.	Silver chloride introduced.	Silver after digestion.	Chloride, digestions.	Left, digestions.
.959	.290	.224	.213	.204
.958	.193	.187	.185	.180
.957	.096	.093	.089	.093
.956	.048	.044	.044	.040

Inspection of these figures reveals the fact that (1) an appreciable quantity of silver chloride is always left, even after three digestions. (2) With the exception of the first experiment, almost the whole of the silver chloride remains in the final residue, each digestion removing only insignificant quantities. These latter, in fact, were only recognised with difficulty in the filtrate, owing to the presence of the ammonium salt produced by the neutralisation of the alkali.

In order to satisfy myself that a weaker solution of ammonia has not a superior solvent action on silver chloride, I repeated the experiments given in the third column above, but with a solution of ammonia half the strength. The results were :—

.204	.180	.093
compared with		
.204	.180	.093

previously obtained. Dilution, therefore, has no influence on the result.

The ratio of the residual silver chloride, after three digestions, to the total weight of the mixed chloride is $\frac{213}{454} = 213$ i.e. $= \frac{1}{2}$, a ratio which corresponds pretty closely with the figure .233 obtained by Chapman Jones on the examination of the action of aqueous ammonia on the compound. Hg_2Cl_2AgCl , the residual compound being, according to this author, $Hg_2AgNHCl$.

A better analytical method is to treat the residue left by ammonia with warm concentrated nitric acid, mixed with enough hydrochloric acid to convert the amido-chloride of mercury into mercuric chloride. In the presence of silver a white residue is left, which does not blacken in ammonia, but entirely dissolves.

F. LETEUR.

THE PHOTOGRAPHY OF CLOUDS.

M. ANTONIADI, in the April number of *Knowledge*, gives some hints, accompanied by excellent illustrations, on the photography of clouds. "It

has been found that the number of days yielding interesting forms of clouds is but a limited one. Long weeks succeed each other without one recording a single typical cloud. Occasionally, however, we may observe the richest forms undergoing rapid and singularly beautiful transitions. . . . The first point to be attended to in cloud photography is to have the camera and plates always ready, so as to be in a position to immediately photograph any evanescent atmospherical phenomenon. Trivial as the statement appears, it is of paramount importance. In fact, without this precaution, the negatives of rainbows, solar halos, lunar coronæ, &c., would probably never have been secured at Juvisy. As a rule, the duration of fine cloud effects, or of the optical phenomena of the atmosphere, are of very short duration, and the loss of time involved in fetching plates or engaging in other preparatory work at the last moment is often a source of disappointment; for instance, to see a bright rainbow fade off and vanish when 'everything is ready' produces a tantalising effect too galling to be endured more than once when economy of time will serve as a preventive medicine. . . . The proper time to give to the exposure is the beginner's stumbling-block. In fact, the question is of a very complex character, inasmuch as it depends on a large number of factors, such as the angle of the object-glass, the diameter of the stop, the sensibility of the plates, the saturation of the screen, the luminosity of the clouds, the sun's altitude, &c. Laying down a rule for the exposure is an impossibility under such circumstances."

A FEW WORDS ON FILMS.

A good deal has already been written on the question of films *versus* plates (and vice versa) for negative purposes, and it is quite evident that the last word has not been said on the subject yet. For lantern-slide purposes, there are many who prefer glass to film for making the original negative, owing to the grain of the latter. Film has certain disadvantages, but there is little doubt that for negative-making it is coming more and more into use. The question might be put, If film was the same price as glass, would the latter be discarded for all purposes where it is now used, except perhaps for studio work? Some authorities have gone so far as to state that it would, but it is, perhaps, too much to claim.

There is no getting away from the fact that the specific gravity of film and glass differs greatly; but, at the same time, it is equally true that users of film have to pay fairly heavily for the convenience, as a comparison of the prices of film and glass will show.

But many will consider that the convenience of greater portability which film offers is for many purposes—out-door work generally—worth paying for. The Tella Company pithily puts it in this way: "Fifty films weigh 6 ounces; fifty plates would weight 5 pounds." Comment is unnecessary. In the first place there is no magazine camera on the market which takes fifty glass plates, and, if there were, it would be a cumbersome affair, and, when on the photographic expedition, the worker, after carrying his weighty instrument until his arm refused to carry it further, would feel disposed to pitch the whole concern into the nearest ditch. It might be said that such a number of plates is never required, or very rarely; but, assuming this to be true, a hand camera designed to take a much less number of (glass) plates becomes inconvenient to carry if the distance traversed is at all considerable.

There are many (including the writer) who have found a Frena—as a hand camera—almost all that could be desired. When fully charged with forty films, the weight is not appreciably inconvenient when carried for long distances, and the operation of exposing and changing is merely a matter of moments.

An enormous quantity of spool film is used nowadays; and, now that the Kodak Company is issuing films for half a dozen or less exposures, the sale is not likely to be diminished. Many of us have been initiated into the mysteries of photography through the agency of a Kodak, and many users of these popular cameras have, doubtless, suggested to the Company the desirability of introducing a spool for six exposures, as it certainly was decidedly inconvenient, when it was desired to develop the first portion of the film before the whole had been exposed, to cut off the required portion. The writer attempted the operation of cutting off and fixing up again once, and he did not feel disposed to repeat the experiment. Now such an operation has been made unnecessary.

As the photographic papers inform us, inventors are still busy in the direction of film-manufacture, and much is expected, or, at least, much is claimed, for some of the new makes that are being put on the market—the Secco, the Sandell, the Thornton, &c. Some of these new brands, like certain medicines, are expected to do wonders; we shall see.

Whether the cards separating each of the Frena films are at all harmful to the keeping qualities of the film, the writer is not in a position to say: but this much can be said, they form a useful and effective preservative in case of accidental opening of the box containing them to white light. In this event, the edges of the films only will have suffered, i.e., assuming that the pack has not been much disturbed whilst so exposed.

It would be interesting, I think, if some writer who is accustomed to use film for interiors, &c., where there would be possible effects of halation, would give his experiences. It is generally considered that film

greatly minimises the effect of halation, and one does not hear much of backed film.

The writer of these discursive notes is aware that he has said nothing but what is well known; but those to whom these remarks are obvious will, perhaps, kindly remember that there are always new workers to whom a brief consideration of the utility of films may not be without interest.

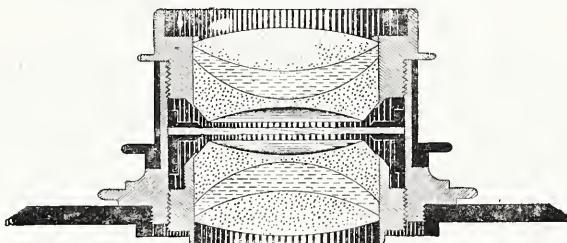
J. A. REID.

THE NEW STEINHEIL LENSES.

MESSRS. R. & J. BECK, of 68-69 Cornhill, E.C., who have commenced the manufacture in England of the Steinheil orthostigmat lens, have kindly furnished us with the following interesting notes on the subject:—

The introduction of the now famous Jena glasses rendered it possible to produce two kinds of lenses which should consist of two positive equal or similar parts, each of which is in itself chromatically, spherically, and astigmatically corrected; consequently the finished lens contains these three corrections, whereas formerly lenses of two positive equal or similar parts could only be corrected chromatically and spherically, as, in attempting to effect the astigmatic correction, an unsymmetrical construction resulted. Astigmatic corrections can only be made in the case of symmetrical cemented lenses on a divisional surface of two media which present the concave side to the more highly refractive medium, whilst the spherical correction can only be made on a

The Beck-Steinheil Orthostigmat.



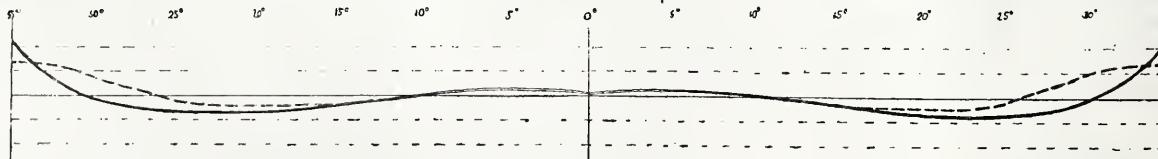
divisional surface which presents the concave side to the not so highly refractive medium.

Having this principle as a basis, lenses can be constructed out of symmetrical or similar halves which on the first divisional surface of the separated halves have the astigmatism corrected, and on the second surface the spherical aberrations. This is the principle on which the Beck-Steinheil orthostigmats are constructed, and necessitates the characteristic that a positive lens is enclosed by a double convex and a double concave one, both of which have a higher refractive power than the enclosed lens.

By examining the accompanying illustration the construction of the orthostigmat can be fully appreciated.

The lens possesses the full working aperture of $f\cdot6\cdot3$ in the smaller sizes to $f\cdot6\cdot8$ in the larger, and considerably more than covers to the very corners of the plates listed; in fact, although the No. 3 orthostigmat is listed as covering only a quarter-plate at full aperture, yet it might fairly be listed as covering a 5×4 or even a half-plate at the aperture $f\cdot6\cdot3$, so perfect are the corrections.

The formula of the orthostigmats in common with most of the best modern anastigmats is such that microscopic errors in the workmanship



of the twelve surfaces most seriously injure the quality of the finished lens. Messrs. R. & J. Beck have therefore introduced into their factory at Kentish Town a new method of manufacture, and testing to ensure that the exquisite definition obtainable with this formula of lens should not in any way be diminished by errors in manufacture.

Each surface is polished and figured on the principle adopted for the manufacture of large astronomical telescope object-glasses. The tests employed are such that an error in a surface which does not exceed a fraction of a wave-length of light may be detected immediately; this accuracy entails of necessity the employment of the most skilled labour, and consequently an increase of price over lenses manufactured in the old way, compensated, however, by an immense increase in optical quality. These new anastigmatic lenses, at present manufactured by Messrs. R. & J. Beck, Limited, have foci varying from $3\frac{1}{2}$ to $23\frac{1}{2}$ in., and covering plates from $3\frac{1}{4}\times3\frac{1}{4}$ to 28×24 in. They are applicable to all kinds of rapid instantaneous work requiring the maximum definition with as large an aperture as possible, or for process work where speed, angle, and covering power are required.

The curve which is here illustrated is taken, so Messrs. Beck inform

us, from a finished orthostigmat by actual measurement (at full aperture) and represent the amount of curvature of the field for both radial and tangential rays respectively. In order to make the curve visible, the errors have been exaggerated in a vertical direction, the horizontal dotted lines representing a distance of 1 mm. out of focus on either side of the central plane. When it is remembered that the photograph of a point would be represented by a circle not larger than $\frac{1}{300}$ of an inch in diameter, in the case of a lens having 1 mm. variation in the curvature of the field and in the curve illustrated, it will be observed that, until we get to about an angle of 64° , the Beck-Steinheil orthostigmat will give almost microscopic definition over the whole range of its plate at the full aperture, and also allows of the use of the rising front even with the aperture of $f\cdot6\cdot3$ to the extent of at least an inch in the small to 2 or 4" in the larger.

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—LANCASHIRE AND CHESHIRE CENTRE.

A MEETING of delegates from affiliated and non-affiliated societies in the Lancashire and Cheshire district was held in the rooms of the Liverpool Amateur Photographic Association on Monday, April 2, Mr. John P. Welch (President of the L.A.P.A.) in the chair.

The minutes of the previous meeting of the centre were read and confirmed, after which Mr. F. W. Parrott (Manchester A.P.S.) stated the reason why the work of the centre as previously established had not progressed.

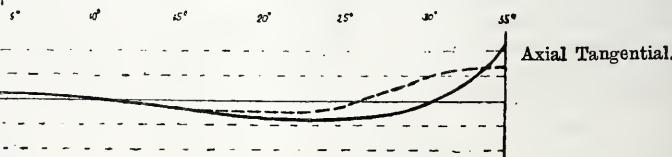
Mr. H. Snowden Ward (London) explained the circumstances attending the calling of the present meeting, which was arranged at the request of a couple of affiliated societies in the district.

Mr. S. E. Collinson (Preston Scientific Society, Photographic Section) asked that the advantages of the Affiliation might be stated for the benefit of delegates from non-affiliated societies. So far as he could see, the principal prospect of advantage was the lectures. He had had no experience of the lectures supplied by the affiliated societies, but had borrowed travelling lectures from other sources, and found that his Society considered them practically useless. He asked if the lectures were guaranteed by the Royal Photographic Society.

Mr. Snowden Ward explained the principal advantages of the Affiliation in detail, but pointed out that it was not in any sense a business arrangement, but simply an organization whereby certain affiliated societies subscribe a small sum per year, and appoint their own delegates to employ the funds so raised in any way they pleased for the advantage of the societies.

Mr. D. E. Benson (Southport P.S.) said that, from long personal experience as Secretary, he could speak highly of the value of the Affiliation lectures. He was doubtful how a local centre would work, since, although the smaller societies would be very anxious to co-operate, very little co-operation was in their power. Hence the benefits would be very one-sided, the one or two large societies in the district giving all and getting little or no return.

Mr. Fred A. Schierwater emphasised what the Chairman had said about the anxiety of the L.A.P.A. to assist the neighbouring societies in every way possible, but he feared that there were very few of the lectures and demonstrations given at the Liverpool meetings which could well be transferred to neighbouring societies. The Affiliation lectures were specially prepared as travelling lectures, whereas most of the Liverpool Society's arrangements were for extempore lectures or for demonstrations which required the presence of their originator.



Mr. Paul Lange (Liverpool A.P.A.) again emphasised the anxiety of Liverpool to assist as far as possible, but feared that a suggestion which had been made that the Liverpool Society should practically undertake the control of the local centre was one which could not be carried out, as all the working members were more than busy with their own matters, and, further, as a matter of general convenience, it seemed desirable that the smaller societies should volunteer to manage the work. If they did so, he felt sure that they would never appeal in vain to the Liverpool or Manchester Societies for assistance. He asked that Mr. Wade should express the opinions of the Manchester Society, as, in spite of the fact, through a misunderstanding, Mr. Parrott had been unable to take up the work of the centre, he felt quite sure that Manchester was the best place for a nucleus.

Mr. J. W. Wade (Manchester A.P.S.) asked that the representative who had come from London would say exactly what was expected from a society like the Manchester or Liverpool Societies in reference to the smaller affiliated societies, and particularly whether lecturers before the larger societies were felt to be under any moral compulsion to offer their papers to the smaller societies. He feared, if this were so, there would be

much difficulty in inducing good men to lecture. A scheme of federation had been formed a few years ago by Mr. Coulthurst and other Manchester men, but it had failed of materialisation because of the difficulty of providing for the large and the small societies to work on the same lines.

Mr. F. W. Parrott (Manchester A.P.S.) said that he attended the last meeting as the representative of a small Society (Altringham), now he presented a large one, and, though it might seem inconsistent, he must admit that the problem looked very different from the two different points of view. The large societies had practically all to give and little to gain from any increased work in a local centre. As a matter of fact there was a good deal of exchange between the larger societies (Liverpool, Manchester, Leeds, &c.), and their experience showed the enormous value of such co-operation. He felt sure, therefore, that similar interchange between the smaller societies would be equally, or perhaps even more, advantageous. A practical difficulty which had for long prevented his Society from joining the Affiliation was the Affiliation rule whereby a member of an affiliated society had practically an unlimited right of using the rooms, lectures, and other conveniences of any affiliated society. In cases where there was a large society with considerable funds and a fairly high subscription, surrounded by closely neighbouring societies with small funds and small subscription, this rule was felt to be a disadvantage.

Mr. Snowden Ward briefly replied to the last two speakers that there was no "expectation" that, because a gentleman prepared a lecture for a large society, he would necessarily undertake to repeat it for the smaller ones in the district, and that the rule to which Mr. Parrott referred had never been interpreted by the executive as giving visiting members such rights as Mr. Parrott feared, but that it was considered a matter of honour that the members of the affiliated societies should only make use of other societies' courtesy in any way as would not possibly be felt as an abuse. The Liverpool Society had, he believed, found the question arise, and had satisfactorily dealt with it.

Mr. Welch suggested that possibly the larger societies could help the smaller ones when engaging lecturers from a distance, for, if the larger society paid the lecturer's fee and travelling expenses, it was possible that he would arrange to repeat his lecture on the next night for a neighbouring society for a reduced fee and practically no travelling expenses.

Mr. Collinson feared that, even in a group of the smaller societies, his own (Preston) Society could scarcely offer much real help, as its members were bashful, and it was difficult to induce them even to address their fellow-members.

Mr. Benson feared that Southport was in the same position, and that they had the further difficulty that they could hardly invite a gentleman from a distance, since their meetings were very small. They had found the Affiliation lectures answer all practical purposes.

Mr. Schierwater referred to the question raised by Mr. Parrott, who said that the Liverpool society, while most anxious to extend all possible courtesy to all *bond-fide* visitors, had found it necessary to distinctly state that the clause allowing reciprocal advantages as a right must only apply to societies beyond a twenty-mile radius. He moved, as a definite recommendation to the executive, that the rule allowing the privilege of attending meetings, using dark rooms, &c., of other affiliated societies be removed.

Mr. Parrott seconded this, and it was carried.

Mr. Lange appealed to the delegates present to supply a volunteer secretary for local centre, and, after considerable further discussion, in which many detail points in the working of the Affiliation were raised, Mr. Benson proposed that a meeting of the secretaries of the affiliated societies be called once a year, at the beginning of the session.

Mr. George Birtwhistle (Sefton Park) strongly supported this, as also did several other members. Finally, Mr. Welch suggested the resolution be: "That the secretaries of affiliated and non-affiliated societies in the Lancashire and Cheshire district be summoned by the Secretary of the Affiliation to meet during the first week in September, the object of the meeting being to arrange for mutual assistance in drawing up the season's programme." This was carried unanimously.

On the proposal of Mr. Collinson, seconded by Mr. H. Snowden Ward, he thanks of the meeting were tendered to Mr. Welch for his services in his chair, and to the L.A.P.A. for the use of the room.

Class VII. (Stereoscopic Work and Transparencies).—Silver (No. 238), John H. Spencer; silver (No. 241), L. S. Wilks.

Class VIII. (Hand-camera Work).—Silver gilt (No. 262), C. F. Inston; silver (No. 254), W. E. Inston; bronze (No. 250), T. E. Corney Wilson.

Class IX. (Lantern Slides, sets of 6).—(a) Silver gilt (No. 312), Ernest Marriage; (b) silver (No. 320), John Gunston; bronze (No. 325), Wm. Harvey; bronze (No. 343), Eustace Young.

Special.—Gold medal for best picture (No. 39), W. T. Greatbach; gold medal for best set of lantern slides (No. 320), John Gunston; *Amateur Photographer* medal (No. 39), W. T. Greatbach; *Photography* medal (No. 60), James Patrick.

Donors of medals:—Gold Champion Medal—Sir Elliot Lees, Bart., M.P.; C. J. Procter, Esq. Silver and bronze (one of each)—W. H. Lever, Esq.; T. L. Dodds, Esq., J.P.; H. B. Smith, Esq.

The Exhibition, which was a large and representative one, was kept open for two extra days, on account of its very great success. We congratulate Mr. Inston and the executive of the Birkenhead Association on having organized the Exhibition, the photographs thereat constituting about as good a collection of modern work as it would be possible to get together.

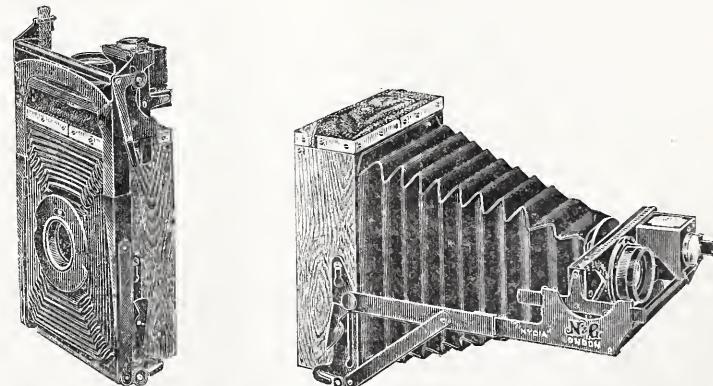
Our Editorial Table.

THE NYDIA POCKET CAMERA.

Manufactured and sold by Newman & Guardia, Limited, 90-92, Shaftesbury-avenue, London, W.C.

The latest introduction of the well-known house of Newman & Guardia, Limited, makes a direct appeal to that large class of photographers with whom compactness and portability of apparatus are *desiderata*. The "Nydia" camera, when closed up, measures no more than $7\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{2}$ inches, and when loaded weighs under one and three-quarter pounds. Thus it may be comfortably carried in most coat or jacket pockets. From a careful examination of the instrument we have been enabled to ascertain that it is quickly "got ready for action," and just as quickly folded up; that the setting and release of the shutter are accomplished by simple mechanical movements, and that the popular "N. & G." changing system has been so improved, that the entire plate is now lifted into the bag, and thus the more easily placed *in situ*. We append a detailed description of the Nydia, which, with the accompanying illustrations will enable the reader to acquaint himself with the minutest details of this cleverly devised and exceedingly well-made little instrument:—

The body is the changing-box itself. A set of light but very strong



metal struts connects this with the front, and holds all parts rigidly set out when in use. The bellows is attached to the box, and by a simple device (a slight rotary movement) it can be instantly fixed to or detached from the back of the shutter, making an absolutely light-tight joint.

The whole operation of setting and re-folding the camera takes only four or five seconds.

The "Nydia" is stocked fitted with four different makes of lenses, viz.:—French rapid rectilinear, f-8; Wray rapid rectilinear, f-8; Ross new symmetric anastigmat, f-8; Zeiss Satz anastigmat, f-6.3. These lenses are supplied in extra light and small cells, and the Zeiss anastigmat has been specially computed by the Jena Works for the "Nydia." All have the normal focus for quarter-plate— $5\frac{1}{2}$ inches. The "Nydia" mount is fitted with a frictionless Iris-diaphragm, and the scale is engraved up to f-45.

The shutter measures only $4 \times 1\frac{1}{2} \times \frac{5}{16}$ inches, and is made entirely of metal and dust-proof. The blades work between the lens combinations, by a vertical slit. The action is smooth, there being no vibration with any exposure. The pneumatic cylinder is entirely enclosed, and the scale is graduated for automatic exposures of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, and $\frac{1}{128}$ th second—all tested. Time exposures can also be made.

The finder is of the real image type, and very light; it gives a picture

THE BIRKENHEAD EXHIBITION.

The following is the list of the Judges' awards:—

Class I. (Landscape).—Silver gilt (No. 39), W. T. Greatbach; silver (No. 15), Edward Atkinson; bronze (No. 23), C. F. Inston.

Class II. (Seascape and Marine).—Silver (No. 122), C. F. Inston; bronze (No. 115), T. E. C. Wilson.

Class III. (Portraiture and *Genre*).—Silver gilt (No. 154), Robert Lyon; silver (No. 145), R. S. Webster; bronze (No. 175), C. M. Wane.

Class IV. (Architecture).—Silver (No. 200), W. T. Greatbach; bronze (No. 196), J. C. Warburg.

Class V. Photo-mechanical).—No award.

Class VI. (Photo-micrography).—Silver (Nos. 231, 232), A. E. Goodman.

$\frac{1}{16} \times \frac{1}{2}$ inch. It can be quickly charged from the vertical to the horizontal position by merely sliding it in and out of its spring holder. The camera has the full range of focus from two yards to infinity. A lever and scale enable the worker to alter or fix the focus in an instant. The friction of the guide-plates is adjustable.

The magazine of the "Nydia" is similar to the "N. & G." changing-boxes. The boxes are made in two forms: No. 1, for twelve cut films only; No. 2, for eight plates or eight films. Any kind of $4\frac{1}{4} \times 3\frac{1}{4}$ films or plates may be used; the latter, however, must be coated on thin glass.

The boxes are all interchangeable, and easily fixed to and detached from the camera, so that, by using several boxes, the number of exposures a photographer can make without resorting to a dark room is practically unlimited.

A vertical swing of ample latitude is provided by the metal framework.

Studio Gossip.

THE biograph now being exhibited at the Westminster Aquarium shows the fight between Sharkey and Jeffries at the Coney Island Athletic Club last year. The films are the largest and longest yet seen in England. They are $7\frac{1}{4}$ miles long, and contain 216,000 separate photographs. The cost of production was £2500., and 4 cameras, 400 arc lights of 800,000 candle power, and 12 skilled operators were in requisition. The light concentrated over the 24-foot ring was sufficient to light a city of 50,000 inhabitants.

MIRRORS of glass were, in all probability, first made at Venice in 1300, and that enterprising republic enjoyed a monopoly of the manufacture for about a century and a half. The Venetians guarded the secrets of the manufacture with the utmost jealousy. By their statutes any glass-maker carrying his art into a foreign state was ordered to return, on pain of the imprisonment of his nearest relatives, and if he disobeyed emissaries were delegated to slay him. From the twelfth to the end of the fifteenth century, pocket mirrors, or small hand mirrors suspended from the girdle, were indispensable adjuncts to ladies' toilettes. The cases in which they were enclosed were generally of ivory, carved with representations of some real or imaginary scene. Sometimes, however, these were of gold, silver, enamel, ebony, and other costly materials, lavishly decorated with the highest efforts of art, workmanship, and jewellery.

News and Notes.

THE NEWCASTLE CONVENTION.—From the list of those present at the Council meeting on the 29th ult. the name of Mr. H. M. Hastings was accidentally omitted.

MR. FREDERIC VILLIERS, the war artist, will, on Thursday, April 19, give a lecture at St. James's Hall, in which he will recount his experiences during the South African War. During the course of his lecture he will show a large number of slides taken from hitherto unpublished photographs.

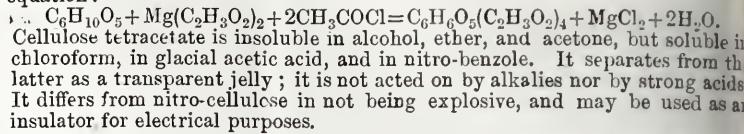
ROYAL PHOTOGRAPHIC SOCIETY.—The Exhibition of pictures by the National Record Association will close on Saturday, April 21, until which date it is open, to those interested, from 10 a.m. to 4 p.m. On Wednesday, April 25, Mr. F. H. Evans will inaugurate an exhibition of his photographs (mainly architectural) at 66, Russell-square, at 8 p.m., with an address. Tickets may be had on application to the Secretary.

DURING a recent visit to Christmas Island, 200 miles south of Java, C. W. Andrews, of the British Museum, was able to verify by photographs the story that the palm crab (*Birgus latro*) climbs trees, which is done not only to secure the fruit, but also to feed on juices from cuts in the tree tops. Some of the smaller land crabs do great service in renewing the soil by continual burrowing, doing work performed elsewhere by earthworms.

THE Easter Excursion of the Borough Polytechnic Photographic Society, this year, is to Chichester Cathedral, under the leadership of Mr. F. W. Gregg, who has prepared, for the information of members and friends joining the party, some useful notes, with plan, giving the most suitable times, formulated by practical experience, for photographing the various aisles and principal objects within the Cathedral. A portion of the party will make a week-end stay, and "do" the surrounding places of interest, whilst the remainder will travel by early train on Easter Monday for the day only. Headquarters will be made at the Bedford Temperance Hotel. A cordial welcome is extended to members and friends of other societies, and full particulars can be obtained from the leader, Mr. F. W. Gregg, 37, Angell-road, Brixton, S.W., or from the Hon. Secretary, Mr. P. C. Cornford, 103, Borough-road, S.E.

HYDROGEN AS A SOLID.—A year ago Professor Dewar astonished and delighted the scientific world by liquefying hydrogen. Now he has gone a step further, and has produced hydrogen as a solid. In a series of beautiful and unique experiments, made before an interested audience at the Royal Institution last week, he showed how this gas could be solidified by surrounding a tube containing it with liquid air to prevent the ingress of heat, and then, by applying a powerful air pump to the liquid hydrogen, transformed it into a white opaque solid. Discussing the question of the utility of solid hydrogen in scientific research, Professor Dewar said the mere fact of its transformation from a gas was interesting simply because it was an elementary body of the lowest atomic weight and its molecules had the greatest rapidity of motion of any known body. One of its uses was in the solidification of oxygen, and it could also be used in the separation of mixed gases.

CELLULOSE TETRACETATE.—A note in *Pharm. Centralh.* states that this ester is prepared by heating a mixture of molecular proportions of cellulose with magnesium or zinc acetate and two molecular weights of acetyl chloride and eventually with acetic anhydride. Nitro-benzole (as a solvent) is gradually added to the acetylising mixture, the greater part being added at the last when the temperature is highest; the reaction is represented by the following equation:—



THE causes of the deflection of a projectile as it leaves the gun is the interesting and important study which Professors Cranz and Koch have begun. The experiments thus far have been made with an ordinary rifle, and the method has consisted in throwing a beam of light from a bright spot on the barrel upon a rapidly moving sensitive film, the vibrations of a tuning fork being photographed at the same time for comparison. The position of the reflecting spot and the size of the powder charges are systematically varied. The gun reaches its greatest vibration after the ball has left it, but motion before is distinctly recorded, and is especially marked with reduced charges. The true theory is yet to be worked out. Release of the barre from the weight of the projectile, waves of heat causing unequal expansion and the thrust of the gas ring against the rising, are among the suggested causes of the vibration, but the real explanation will, doubtless, be found in a combination of several forces.

AT the recent annual meeting of the Association of Chambers of Commerce the following resolutions referring to the metric system were carried unanimously: (1) That steps be taken by this Association to again urge Her Majesty's Government (a) to introduce into, and endeavour to carry through Parliament, as speedily as possible, a Bill providing that the use of the metric system of weights and measures shall be compulsory in this country within a period of not more than two years from the passing of the Bill; and (b) to adopt the system with as little delay as possible in all specifications for Government contracts. (2) That in the opinion of this Association it is necessary, in order to promote knowledge of the metric system of weights, measures, and money among the people, that the Education Department should require Her Majesty's Inspectors to hold a real and effective examination of scholars in this system in the public elementary schools, and that a deputation of this Association do wait upon the Vice-President of the Committee of the Council on Education, and call his attention to the necessity of such examinations by Her Majesty's Inspectors.

ROYAL INSTITUTION.—The following are the lecture arrangements at the Royal Institution after Easter: Dr. Hugh Robert Mill, three lectures on Studies in British Geography; Dr. Alexander Hill, two lectures on Brain Tissue considered as the Apparatus of Thought; Mr. R. Warwick Bond, two lectures on (1) Ruskin, Man and Prophet, (2) Ruskin, the Servant of Art; Professor Dewar, four lectures on A Century of Chemistry in the Royal Institution; the Rev. Canon Ainger, three lectures on Chaucer; Professor Stanley Lane-Poole, two lectures on Egypt in the Middle Ages; Dr. Alfred Hillier, two lectures on South Africa, Past and Future; Sir Frederick Bridge, three lectures on the Growth of Chamber Music from Allegri's Symphonia (1580-1552) to Haydn's First Quartet (with musical illustrations). The Friday evening meetings will be resumed on April 27, when a discourse will be given by the Right Hon. Lord Kelvin on Nineteenth-century Clouds over the Dynamical Theory of Heat and Light. Succeeding discourses will probably be given by Professor T. E. Thorpe, Mr. Sidney Lee, Professor J. A. Ewing, Mr. Francis Fox, Sir Henry Roscoe, and other gentlemen.

THE "Autographed Photograph" Young Lady writes to our contemporary, *The Stage*: "I wrote to Madame Sarah Bernhardt when she was at the Adelphi last June, asking if she would favour me with her signature to an enclosed photograph of herself. As I had no reply, I wrote again, asking if she would allow some one to put it in the post, as it was already done up; and I have written twice to Paris, but can get no answer. I think she might have let me have the photograph back. My crime certainly did not merit so severe a punishment. I have wondered so many times if she ever saw my letter; and you so often mention the subject of autographs that I thought I would venture to ask if you could tell me whether Madame is obdurate on the subject. I sent the same request to M. Coquelin, and he was so exceedingly kind as to send me the signature. I am glad to see that some of the musical profession are following Mr. Barrett's example. But I wrote to an eminent singer in January, asking him if he would favour me with his signature, and enclosing a small donation for the benefit of the funds he might prefer. He has neither answered my letter nor acknowledged the order! I have written four times, enclosing a stamped, addressed envelope each time, but he will not deign to reply. It is not the value of the order I care about—he is quite welcome to that; but I think he might have had the courtesy to send back one of the envelopes just to say he received it. I have been much interested in the account of Miss Hosmer's adventures in pursuit of Sir Henry Irving's and Miss Terry's autographs. I can sympathise with her! I am so fortunate as to possess both their signed photographs. I shall never forget Sir Henry's kindness in sending his; there are not many people like him, for he always does everything in just the right way. No wonder he is loved as he is."

Commercial Intelligence.

THE PHOTOGRAPHER AND THE THEATRE COMPANY.—At the last sitting of the Grantham County Court, before his Honour Judge W. Wightman Wood, Mr. H. J. Bliss, photographer, London-road, Grantham, sued the Grantham

theatre Company to recover the sum of 5l. 17s. 6d., the value of oxygen gas, &c., supplied. The defendants paid 4l. 1s. 4d. into court. Mr. J. B. Barlow appeared for the plaintiff, and Mr. T. Norton defended. In opening, Mr. Barlow said the gas was supplied for the purpose of producing limelight at the theatre, and the contract between plaintiff and the defendant Company's secretary (Mr. J. H. Sneesby) was that it should be supplied at catalogue price. Mr. Bliss said he had supplied the Theatre Company with oxygen since 1894 at catalogue price. He had an interview with Mr. Sneesby in November last, when he arranged to supply the Company at Brin's catalogue price, prompt payment to be made on the fifteenth of each month. He had applied all the gas charged for, and that was at the price quoted in Brin's catalogue. Miss Edith Thompson, in the employ of the plaintiff, gave corroborative evidence as to the agreement for the supply of gas. The defence as that prior to November last the defendants had been getting their gas direct from Brin, and, when Mr. Bliss sought their custom, he was told that they had no objection if he could supply gas at the same price as they had been paying. Mr. Sneesby showed complainant what price the Company had been paying, and complainant agreed to supply it at that price. When the account was sent in it was found to be excessive, and Mr. Sneesby complained of that effect. Mr. J. W. Bolton, Chairman of Directors of the Grantham Theatre Company, said he saw plaintiff at the end of October or the beginning of November last, and complainant asked to supply the Company with gas. Witness asked if he could supply it at the same price as they had been paying, and his reply was that he could. Mr. J. H. Sneesby, Secretary and Manager to the defendant Company, said the arrangement between him and complainant was that complainant should supply the gas at the price the company had been paying when they dealt direct with Brin. Other evidence having been heard, his Honour found for the plaintiff for the amount claimed, £ss 4s. 2d.

LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY, LTD.—The Fifteenth Annual General Meeting of the shareholders of the above-named Company was held on Thursday at 106 and 108, Regent-street, W. Mr. William Clarke, who presided, said: "It is rather curious that about this time last year Mr. Kennard (the Chairman of the Company) was kind enough to make an explanation with regard to my then absence in Egypt, and I have to make a similar explanation on his behalf to-day. He unfortunately, owing to the illness of his wife, has been compelled to take a voyage, and has not yet returned. I think I have very little to say concerning the affairs of the company, but I regard the position as very satisfactory. There was less business done last year in the bicycle branch than had been done previously; but, of course, we knew that that was only a flash in the pan for the time being; but we are still carrying on the business, and find it more or less enumerative. What is more material is the progress of our photography work. As we all know, owing to the war, from the month of October last year to the end of the twelve months pretty well every one who had a 5l. note to spare very generously and properly put it into one of the excellent funds in aid of the families of those who have gone to the war, and I need hardly tell you that in this kind of business, if the spare 5l. note goes in that direction, there is so much less to be spent on what I may term the luxury of photography. Coal and food are necessities of life; but you can hardly say that of photography; and, although every trade must feel the effects of the war, I think it affects us more materially than, perhaps, any other industry. Although we did less amount of business last year in bicycles, it was by no means inconsiderable. It is rather remarkable, but exceedingly satisfactory, to observe that our net profits for the year are practically the same as in the year before. In other words, our purely photographic business was very much better, and our four per cent. which we have earned during the past year was almost solely from photography. I think that is a very satisfactory state of affairs. What this year will bring forth I do not pretend to prophesy. Amongst the large number of officers at the front are many who are our customers, and no doubt we shall feel the effect of their absence. However, we shall do all that we can, and we cannot do more. Up to the present moment our business has been well maintained, and I see no reason to think that it will be otherwise. There is a certain amount of monotony at the meetings of this Company; but it is not altogether, perhaps, unsatisfactory. For three or four years we paid only two and a half per cent., but this is the fifth year that we have paid four per cent. Perhaps that is not a very large dividend; but I would remind you that we have a good deal of 'top hamper' in regard to the amount of our capital, and I think that, if we keep up four per cent. in these times in a business of this character, it is not at all unsatisfactory. I now beg to move the adoption of the report and accounts as presented." Mr. Albert Snee Hicks seconded the motion, which was unanimously agreed to. The Chairman proposed the re-election of Mr. Hicks to his seat on the Board, and the motion was seconded by Mr. Thomson, and unanimously carried. Mr. Hicks thanked the shareholders for their renewed confidence, and said he had no doubt as to the successful future of the Company. On the motion of Mr. Lemaire, seconded by Mr. Stanbury, the retiring auditors (Messrs. W. B. Peat & Co.) were re-appointed. Mr. Cuthbertson moved a vote of thanks to the Directors, and said he thought they were to be congratulated on the results of their efforts for the past year. He believed their personal and practical interest in this Company was very great, and that they spared no pains to put it in a foremost position in London. He was especially gratified to see the efforts they were making in reference to fine-art studies, as he thought that was a move in the right direction. Mr. Douthwaite seconded the motion, which was unanimously passed. The Chairman acknowledged the compliment, and said the Board would do their best to keep up with the times, and meet the competition of the day. They had a large number of things brought to their notice in the shape of novelties and patents, and if they went into all of them they would soon be in bankruptcy. But they tried to select only those things that were of marketable value, and he thought they had been fairly successful in that respect. A great feature of their present work was the photography in relief, which was of a highly artistic character, and was becoming very popular. He concluded by moving a vote of thanks to the General Manager (Mr. Mitchell) and the staff, by whom, he said, the Company was really well served. They

had not only a skilled staff of men, but men who had the interests of the Company deeply at heart. This was not an easy business to carry on, and, under the circumstances, he thought their staff did remarkably well. Mr. Hicks seconded the motion, which was unanimously passed. Mr. J. Lillie Mitchell thanked the shareholders on behalf of himself and the staff generally. He remarked that even the smallest orders involved a large amount of detailed work, and had to be followed through every department. They had recently made a new departure in photography by calling in the assistance of an able artist, who took in hand the photographs, utilised certain parts, and produced an artistic picture in black and white, which was copied and offered to the public. The relief work was also an important branch, and, he thought, a very striking novelty. The Company had, with the patentee, secured the sole right for the next three years of publishing the portraits of celebrities by this process. The Company's pictorial post cards maintained their popularity in spite of all competitions, and he certainly thought they were the best value for one shilling that anybody could have. They were just issuing to the public a souvenir war sheet, comprising portraits of military men who figured most conspicuously in the present war, including one of General Roberts, which was recognised as the best in the market. They were to be sold at one shilling each, but it was the intention of the Company to send copies to the different convalescent hospitals where our wounded soldiers were being looked after, as it was considered it would be gratifying to them to see likenesses of their leaders. At the suggestion of a shareholder who pointed out that this Company possessed the privilege of a Royal Warrant, it was unanimously resolved to send a message of congratulation to H.R.H. the Prince of Wales on his providential escape from assassination at Brussels. A vote of thanks to Mr. Clarke for his conduct in the chair terminated the proceedings.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
16.....	Bootle	{ Excursion: Incé Woods. Leader, Mr. Wright.
16.....	Borough Polytechnic	{ Excursion: Chichester Cathedral. Leader, F. W. Gregg.
16.....	Stafford Photo. Society.....	Prize Slides.
17.....	Gospel Oak	{ Illustrated Lecture: How a Lens is Made. Lent by C. P. Goerz.
17.....	Hackney	{ The New "Pressed" Gas Light for Portraiture. Messrs. Adamson Bros.
17.....	Isle of Thanet	{ Demonstration: Film Photography. Secco Film Company.
17.....	Redhill and District	{ Lakes, Mountains, and Glaciers of Switzerland. Jas. A. Carter, B.A.
18.....	Croydon Camera Club	{ Plates and Papers for Pictorial Effects. A. Horsley Hinton.
18.....	Southsea	{ The Photography of Flowers. H. T. Malby, F.R.P.S.
18.....	Tunbridge Wells	{ Demonstration of Secco Films by the Makers.
18.....	Woodford	Exposure. Alfred Watkins.
19.....	Darwen	Members' Lantern Slides.
19.....	London and Provincial	Projection. Thomas E. Freshwater.
19.....	Oldham	Exhibition of Members' Transparencies.
20.....	Croydon Microscopical	{ Demonstration of the Manipulation of Secco Films.
20.....	West London.....	{ Beginners' Meeting: Subjects and their Treatment. J. Brown.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 5.—Mr. H. C. Rapon in the chair.

Mr. W. THOMAS laid before the meeting a matter which had been brought to his attention by Mr. W. H. Atkinson, of Batley, Yorks. Some three years ago a greenhouse was put up in the neighbourhood, and the builder asserted that the glass used was quite new. Eighteen months after its erection Mr. Atkinson noticed that one of the panes of glass bore a faint likeness of a man's head and shoulders, and looking again, after another four months had elapsed, found that the image was much more pronounced. With a desire to get to the bottom of the affair, he had the glass removed, and this Mr. Thomas now submitted. The image was undoubtedly formed by a lens, and the suggestion was that the glass was a spoiled plate from a photographer's studio. It appeared also that the portrait had been recognised as that of a man living in the neighbourhood, although no steps appear to have been taken to confirm this, and so to trace the photographer. The image was fairly strong, and resembled that on a collodion plate.

Mr. R. CHILD BAYLEY, who had had part of the negatives through his hands, said he had submitted it to various tests. Dilute nitric acid failed to affect it, as did a violent scrubbing with Hudson's soap, and again mixed sulphuric and nitric acids. Not to miss a possible means of affecting the image, cerium sulphate—the new reducer—was tried, but to no purpose. Ultimately it was found that sulphuric and nitric acids put upon the plate, and gradually warmed over the gas, had the desired effect, and the deposit, whatever it might be, was removed.

Mr. S. H. FRY related the details of an incident of a similar nature which came within his own experience. Some years ago a man complained that certain plates had been exposed before coming into his possession in the ordinary way by purchase. He sent along a couple of the plates that he had exposed and developed with the rest of those in the box. Examination of the negatives revealed the fact that there were two images; one was that produced by the photographer, and the other was a portrait of a girl employed in the plate factory. It appeared that the girl served as the model for the testing of the plates, and that these test negatives had been only partially cleaned, recoated, and issued.

Mr. A. MACKIE stated that in the old days, when glass plates were repeatedly used, it was not an uncommon thing to find such secondary images as this passed round, due to imperfect cleaning.

It was found that one side of the plate in question freely took pencil impressions, and scraping with a knife brought something away. But, as Mr. Welford said, although one could easily accept the explanation so far advanced, it was difficult to account for the development (so to speak) of the image while the glass was exposed upon the greenhouse.

PHOTOGRAPHIC CLUB.

APRIL 4.—Mr. F. A. Bridge in the chair.

Mr. W. THOMAS, F.R.P.S., gave a chat on
LANDSCAPE PHOTOGRAPHY,

which was listened to with considerable interest, the capabilities of the lecturer in this branch of photography being well known. With reference to the lenses to be used, Mr. THOMAS remarked upon the deeply rooted impression with most people that good lens of the rapid rectilinear type was a necessity. In his own work, which covered a very wide range, he was shown, however, that this was not necessarily the case. He had secured effects which, in his own opinion, were some of the best he had done, employing cheap spectacle lenses, varying in price, according to his requirements, from pence to three and four shillings. He passed round a set of Busch lenses of this character, with the capabilities of which he was entirely satisfied, the definition being all that he could desire. Mr. THOMAS strongly emphasised the value of long-focus lenses, and showed a picture of Scarborough Headland to illustrate his points. Touching briefly on the much-discussed question of "tinkering" the developer, he then passed on to describe his practice of making rough notes of any effect which might strike him in any of his wanderings, urging the cultivation of a similar habit by others as a considerable aid to picture-making by photography. These notes, for the greater part, consisted of rough sketches in crayon, pencil, or oils, and, when at some future time he might be striving after some particular effect, consultation of these notes proved a great help in carrying out an idea. With practice, anybody, he believed, could acquire sufficient skill to make very useful memoranda of the kind referred to. The lecturer then showed his method of "dodging" or improving a negative, which experience might have demonstrated as in want of a little faking. A piece of tracing paper is laid down on and affixed to the back of the negative. Upon this, with black lead, the "working up" is applied until a satisfactory result is arrived at, frequent "rough pulls" meanwhile being taken to show how matters were proceeding. Several negatives were passed round, some of them particularly fine cloud studies. In this connexion he said that he always used a yellow screen and an isochromatic plate for cloud work, and, in concluding a most interesting and instructive chat, gave expression to the following additional information: In aiming at the production of pictorial work by photography, one must first qualify, he said, as a "good photographer," then as a "skilled photographer," and then, and not till then, attempt to employ that indescribable "something more" which is necessary to the production of a "picture."

A short discussion ensued, in which the Chairman made a few remarks as to truthful photography, drawing comparisons between the kind of work advocated by Mr. Thomas and that known as "bread-and-butter" photography. A hearty vote of thanks to Mr. Thomas for his lecture was given with acclamation.

Hackney Photographic Society.—April 3, Mr. F. C. Gosling presiding.—Among other items was an interesting discussion on the action of rodinal and hydroquinone as developers, alone and combined. The CHAIRMAN showed a very portable home-made view-finder, which was made to fold up for the pocket, and could be used either as a direct vision-finder or with a reflected image. Several members also described home-made contrivances for hastening the removal of hypo from prints and negatives. Finally Messrs. WEBB and PRINGLE gave an exhibition of lantern slides, illustrating a cycling tour in Normandy.

Edinburgh Photographic Society.—At the last meeting, Mr. James Hay presiding, Mr. J. EDINGTON AITKEN read a paper on Paper-making, with special reference to its photographic uses, stating that the British paper-makers had not been able to supply the demand for photographic paper, so that the photographer had been compelled to go to the Continent. The lecture was illustrated by twenty lantern slides, and there was a demonstration of paper-making, a sheet of paper from wood pulp being produced in the room.—Mr. JOHN WARRACK, jun., then read his essay which won the silver medal at the recent Exhibition. The paper dealt with still-life photography, showing that in this line of art the photographer was cut off from illegitimate aids, and nothing but a feeling for composition and a genuine artistic taste could carry him through the ordeal. Richness of effect was not gained by complexity of subject or by the gorgeousness of component parts, but rather by the perfection of harmony that transfigured a few simple elements into loveliness. And if a study of still life brought the photographer to realise this, and apply to his other work the knowledge that it was not what he saw, but how he saw, that mattered, he would find that in engaging in it he had not only gained an inexhaustible resource, but had harboured an angel unawares, and that henceforth his labour had become a delight, and his day's work a romance. Both lecturers were cordially thanked for their papers.

FORTHCOMING EXHIBITION.

1900.
May 23-25 Plymouth Photographic Society. Hon. Secretary,
W. H. Harris, 5, Clarendon-place, The Hoe,
Plymouth.

Those who desire to send photographs to the above Exhibition should write for prospectuses to the Hon. Secretary, whose address is given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between March 26 and March 31, 1900:—

STEREOSCOPIC CAMERA.—No. 5606. "An Improved Form of Hand Camera, Convertible from a Stereoscopic to a Single Pattern by Moving an Outside Lever." W. TYLAR.

DESIGNING MACHINE.—No. 5618. "A Photographic Designing Machine." Complete specification. R. H. BASKETT.

PRINTING FRAME.—No. 5702. "The 'Register' Photographic Printing Frame." G. HYDES and W. BOTTOM.

SHUTTERS, &c.—No. 5737. "Improvements in Appliances for Adjusting and Working the Shutters and Diaphragms of Photographic Cameras." A. WATKINS.

PHOTO-CRHO-MONOSTROSCOPES.—No. 5799. "Improvements in Photo-chromostereoscopes applicable also to Cameras." T. K. BARNARD and F. GOWENLOCK.

PRINT-TRIMMER.—No. 5804. "An Improved Contrivance or Device for Cutting or Trimming Circular or similar Photographic Prints or the like." H. WYKES.

FINDERS.—No. 5934. "Improvements in and relating to Photographic Finders." W. W. BEASLEY.

COLOURING PHOTOGRAPHS.—No. 5939. "Improvements in Colouring Photographic Portraits." F. W. HAYWARD.

STEREOSCOPIC VIEW.—No. 5984. "An Improved Stereoscopic View." W. H. GRANT.

LENS MOUNTS.—No. 6029. "An Improvement in Lens Mounts for Photographic Cameras." Complete specification. W. TAYLOR.

SHUTTERS.—No. 6058. "Photographic Shutter Working without Jerks, and Adjustable for Different Speeds for either Instantaneous or Time Exposures." Communicated by N. Hansen. Complete specification. W. J. MUNDEN.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

THE NEW COPYRIGHT BILL.

To the Editors.

GENTLEMEN,—In the copy of the new Copyright Bill in your JOURNAL of March 30, I see that, "when a photograph is made of any person for a valuable consideration, the owner of the copyright shall not, during the life of the person photographed, be entitled to sell or exhibit, without his consent, copies of his photograph; but, save as aforesaid, the owner of the copyright in a photograph may deal with his right of copyright without the consent of the owner of the photograph, or of any copy thereof."

It seems to me that under this clause the photographer may, after the death of a person, sell copies of the photograph of a private person or a lady, and even transfer the right to do this by mere delivery of a negative (possibly by mistake), and that such such a right is hardly contemplated by those who have draughted the Bill and should be opposed.

It must be evident that, even if a negative were stolen, the family of the subject of a photograph would be unable to prevent the holder of the negative from using it as he chose, to their great annoyance, for it would be practically impossible to prove that copyright had not passed by delivery; in this case therefore there would be no protection even in the good feeling which animates the large body of the profession. I trust that this may be modified, or gentlemen will become cautious how they allow the ladies of their families to sit for their photographs.—I am, yours, &c.,

J. F. T.

AN ADDRESS WANTED.

To the Editors.

GENTLEMEN,—Through the medium of your valuable paper I was enabled to ascertain the address of a sculptor, competent at carving busts from photographs, I now desire a like advantage for the name of a clever hand at cutting cameos also from photographs, thanking you or your informant in advance.—I am, yours, &c.,

W. D.

[We shall be happy to receive such an address from those of our readers in possession of it.—EDS.]

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—I have read with much enjoyment your article on Stereo Photography in the ALMANAC, especially that part detailing your "little

experiment." This I have succeeded in, and can now get a full stereoscopic effect with even unmounted prints. I find, however, that the effort affects my eyes at the time, and my object in writing is to ask you whether, if frequently practised, the effort might not injure the eyesight.

I may say that by getting people to focus their eyes on some object a few feet away, and then to insert in the line of vision the twin photos, viewing them without altering the focus of their eyes, several have obtained the proper stereo effect; but all complain that it affects their eyes.

I am immensely pleased to have acquired this, but should like to be assured on the question of eyesight.

I send you a couple of views of the Falls here (Umgeni River, 300 feet, sheer drop), taken from across the valley. Being only on a visit, I am unable to mount them.

If you have time to reply, will you kindly address me at Box 106, Lorenc Marques, Delagoa Bay. I need hardly say that any remarks re photos sent will be much appreciated. Trusting I am not troubling you unduly—I am, yours, &c.,

H. W. WEEDON.

Howick Falls Hotel, Howick, Natal, March 15, 1900.

[We do not think that our correspondent's eyes are likely to suffer injury by using them in the manner referred to. It is several years since we acquired this command over the power of accommodation, and we have traced no ill effects to it. We have known photographers to exercise this form of optical control for over thirty years, and they have not complained of having harmed their sight. The radii of curvature of the crystalline lens are altered by the influence of the ciliary muscles, which agency also parallelises or converges the optic axes. This is all that may be assumed to take place in looking at binocular views without a stereoscope, and it is difficult to see that any harmful effects can ensue, provided that the photographer is endowed with normal vision and binocular prints are not mounted at wider centres than $2\frac{1}{8}$ in. A separation of over 3 inches certainly strains most eyes, and might cause divergent strabismus. The prints sent are capital.—EDS.]

DUPLICATING DIFFRACTION GRATINGS.

To the Editors.

GENTLEMEN,—As to the question of novelty in making screens on a thin transparent substance from a ruled grating, as shown by Mr. Thorp, of Manchester, and referred to by Professor Wood, I would like to state a few facts as to the originality of this method of making Diffraction Gratings.

At the beginning of this century, Sir Wm. Herschel experimented with of throwing powdered hair into the air before a concave mirror, on which a beam of light was incident, the reflected light received upon a screen gave a perfect spectrum, the particles of scattered hair taking the place of the grating shown by Professor Wood. Sir David Brewster followed up this experiment, and showed an analogous phenomenon in mother-of-pearl, which substance, you know, is obtained from the pearl oyster; and, if a piece with nearly parallel surfaces is taken, and ground down on a stone until the image of a candle, reflected upon its surfaces, is of a dull reddish-white colour, on placing the eye near the plate, we shall see the reflected image of the candle on each side of the centre image, but showing a perfect spectrum, and the angle at which we hold the mother-of-pearl will determine the number of these spectra, exactly as shown by Professor Wood. If the mother-of-pearl is ground extremely thin, and placed in the path of a beam of light, we get the same result exactly as shown with the grating. In making this experiment, Sir David Brewster had occasion to fit a piece of mother-of-pearl to a goniometer with a cement of resin and beeswax, and, upon removing it, he was surprised to see the whole surface of the wax shining with the prismatic colours of the mother-of-pearl. He at first thought that a small film of the substance had been left upon the wax, but soon found this to be a mistake, and it became manifest that the mother-of-pearl had really impressed upon the cement its own power of producing the coloured spectrum. Black wax is the best to use, but transfers can be made on balsam of tolu, isinglass or gum arabic, and to clean surfaces of lead or tin by hand pressure, or the blow of a hammer, and it was calculated that the veins to produce these colours were so small that 3700 of them were contained in an inch.—I am, yours, &c.,

April 7, 1900.

W. P. DANDO.

ORTOL IN INDIA.

To the Editors.

GENTLEMEN,—With reference to the letter on the above subject, on page 143 of your number of the 2nd instant, I suppose that "Tippoo" is trying to be comic in his account of how he failed to make up ortol into a proper solution; but it does not appear to have occurred to him that it was probably his own fault.

Ortol is used regularly by several photographers in my neighbourhood, and they all speak of it in the highest terms. I only write these few lines to prevent others being put off a really good thing by the condemnation of one who has, apparently, made a muddle of his one trial at making up the developer *in one solution*.—I am, yours, &c.,

SULTAN.

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—It is not our business to offer an opinion as to the advantages or disadvantages of the metric system for "the ordinary purposes of life;" the fact that a large proportion of the intelligent public demand it is enough for us to consider. We have, therefore, decided that, in future, all formulæ for our Barnet plates and papers will be given in the metric system as well as the English weights.

For the convenience of our customers we are issuing a little pamphlet giving all our formulæ in this form, together with other useful information, a copy of which we shall be pleased to send, as soon as it is ready, to any one sending us their address.—We are, yours, &c.,

Barnet, Herts, April 7, 1900.

ELLIOTT & SON.

DECEASE OF THE LEWISHAM CAMERA CLUB.

To the Editors.

GENTLEMEN,—I regret having to request you to announce that this Club has been dissolved, a resolution to that effect having been carried, *nem. con.*, at the Annual General Meeting held on the 3rd inst.—I am, yours, &c.,

THOS. P. ROGERS, late Assistant Secretary.

44 Manor-road, Brockley, S.E., April 9, 1900.

STRIPPING ENAMELLED PRINTS FROM GLASS.

To the Editors.

GENTLEMEN,—I have noticed lately a lot of your correspondents complaining of the difficulty of stripping enamelled prints from glass. This difficulty can be entirely done away with by applying a little waxing solution on a tuft of cotton-wool and polishing well afterwards. The prints will then be found to strip quite easily. The waxing solution can be made by dissolving white wax in benzole, or can be bought from almost any dealer.—I am, yours, &c.,

RUPERT GOODCHILD.

Laurel Bank, Alexandra-road, Manchester, April 19, 1900.

REFLECTIONS.

To the Editors.

GENTLEMEN,—In your JOURNAL of the 30th ult. I notice a paragraph, by our dear old friend, Mr. York, with reference to the demolition of that block of buildings at the south end of Tottenham Court-road, which removed, "at one fell swoop," the studio where, more than twenty years ago, the now historical "Brittlebank meetings" were held.

Ah, me! I have been sad ever since I read that paragraph; and even now feel sentimental, and, like Silas Wegg, inclined to "drop into poetry." Twenty-one years ago (echoes of melody whose voice is fled)—yes, here (I mean *there*) in 1879, "in the prime of summer-time" (evenings not "calm or cool," by the bye), a party of gentlemen—members of the old South London—met in that studio, "far removed from the busy haunts of men," and redolent with the odours of fried fish from the restaurant below (the studio, not the gentlemen) to discuss the possibilities of gelatine. "Where is that party now?" scattered! very considerably scattered.

And can it be that the National Record Association, among the hundreds of photographs it has already accumulated, has no picture of these premises? But no matter—a friend has kindly sent one to me, and, knowing your reverence, Mr. Editor, for all that has contributed to photographic journalism, I have taken the liberty of forwarding it to you, that in the quiet evenings ("when the lights are low") you may ruminant on the importance of these early meetings.

Yes, who can tell the influence of those meetings on the future of gelatine? If those gentlemen had never met in that far-distant time to nurse the new baby, how different things might be now. But for these meetings the baby of twenty-one years ago might not be the giant he is at present. The cinematograph might be still unknown, our thoroughfares might never have been traversed by thousands who only "press the button," and leave others to "do the rest." The professional might still be working in an atmosphere of collodion and cyanide; we might still be struggling on with only two photographic journals; photographic societies might not be flourishing (more or less) in every parish; there might even be no National Record Association.

But why continue these sad reflections? Go to! The County Council has spoken; a once-hallowed spot has departed, and, "like the baseless fabric of a vision," left "not a wrack behind."—I am, yours, &c.,

REQUIESCAT IN PACE.

[Our friend is good enough to send us a print from a negative of the celebrated Tottenham Court-road corner, and that print is at once added to our collection. The photographic studio is shown in the top part of the picture, and we see by the theatrical bills on the walls that the photograph was taken in the eighties, *Claudian* and *Called Back* being some of the dramatic fare then current. We never had the opportunity of attending a "Brittlebank meeting," but we have the pleasure of knowing most of those who did. Perhaps no more enthusiastic or better-informed band of workers ever gathered together for purposes of mutual help and study in practical photography.—EDS.]

VIGNETTED NEGATIVES.

To the Editors.

GENTLEMEN,—Referring to the above article in THE BRITISH JOURNAL OF PHOTOGRAPHY, I enclose you a print from a negative vignetted in the camera eight years ago, and recently adopted for the medallion—a style that is much admired in my studio—the rounding-out of the oval with stereoscopic effect has met with great admiration. If you see anything in the photograph worth your notice, I shall be glad to know it.—I am, yours, &c.,

G. HIGGINSON.

The Polygon Studio, Bowdon, Cheshire, April 9, 1900.

P.S.—You may remember my name in connexion with the carbon process when I was in Southport over twenty years ago.

[We are very much obliged to our old correspondent and supporter for the print. As a specimen of camera vignetting, it is admirable, while, as an example of portraiture, it has great delicacy of rendering, and is altogether excellent.—EDS.]

EXPOSURE AND DEVELOPMENT.

To the Editors.

GENTLEMEN,—With reference to a recent lecture of mine now appearing in THE BRITISH JOURNAL OF PHOTOGRAPHY under the above title, may I anticipate any criticisms of its elementary character by pointing out that it is one of a series of six "Lectures to Beginners," prepared by the members of the West London Photographic Society, and delivered during the current session for the benefit of their less experienced fellow-members? The officers of this Society attach great importance to lending a helping hand to beginners, and have endeavoured to give effect to their views in this series of lectures and demonstrations.

The above lecture was repeated by invitation at a meeting of the Chiswick Camera Club.—I am, yours, &c.,

G. F. BLACKMORE.

34, Wendell-road, London, W., April 9, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED :

G. V. Simmons, 53, Bridge-street, Portadown.—Photograph entitled "Hurry back, laddie."

G. B. Bradshaw, High Bank Studio, Altringham.—Photograph of Amateur Naval Brigade in Patriotic War Fund procession, Altringham.

PHOS (St. Paul).—1. We are sorry that such information is not available. 2. Woodbury's book on gelatino-chloride, published by Hazell, Watson, & Viney, 1, Creed-lane, London, might assist you.

CHOICE OF LENS.—P. BIDGOOD says: "I want a lens, and I am undecided as to which to have, a f-5·6 or a R.R. f-8, price being a consideration. Will you, please, tell me if there is really very much difference in their rapidity?"—Yes. The latter will require just double the exposure of the former when both are worked with their full aperture. When both, however, are stopped down to the same ratio, the one will be as quick as the other.

FLASH LIGHT.—A. WILMOT writes: "Will you please say if the enclosed formula is a good one for a flash light. It is said to give a most actinic light, and be of very short duration?"—The formula will give an excellent light, but we should advise our correspondent to have nothing to do with it, as it is a very explosive and dangerous mixture. All these highly explosive compounds are liable to "play tricks" at times, and when they do it is generally when least expected.

GOLD PRECIPITATING.—LANCS writes: "Can you tell me the cause of this? I dissolved a tube of Johnson's chloride of gold in two ounces of water as usual. As soon as it dissolved the solution turned a purplish-brown tint, and next day there was a brown deposit at the bottom and on the sides of the bottle. The bath made with it will not tone at all?"—The cause is either that the water was impure or the solution was made in a dirty vessel, and the gold has been precipitated.

FORMULA WANTED.—AMERICAN writes: "Messrs. —— have recently placed on the market a paper that is worked in a similar fashion to blue print paper, with the exception that it is afterwards passed through an extremely weak hypo bath. As Mr. —— lists this in his catalogue, I suppose it to be a well-known paper, and I would be greatly obliged if you could give me the formula by which it is made."—In reply: If our correspondent will send for Patent No. 8771 of 1884, to the British Patent Office, London, he will probably obtain the information required. The specification will cost eightpence, postage extra.

COPYRIGHT.—LA LA writes: "I photographed a football team for a publisher (he paid me 10s. for cabinet size) for publication. He placed it among several others in book form, and put 'Copyright' on the front cover of book. He now writes to say that, if any publisher wants copies from us for publication, we must refer them to him, as it is copyright. I want to know, is it copyright, as we were never told anything about it before? We have given no consent for copyright."—In reply: The publisher is within his rights. According to the Act, you received "valuable consideration," i.e., payment, and therefore the copyright does not rest with you.

WORKING UP ENLARGEMENTS.—FORWARD writes: "Will you please inform me what is the colour used for working up platinotypes and bromide enlargements? Sepia, when it is used, I find not the exact shade. I have been told lampblack answers. If this is correct, will you inform me what it is soluble in?"—The ordinary water colours are employed, but, of course, they have to be blended to match the tint of the picture. Ivory black, modified with indigo, is very good for platinotypes. "Sepia" photographs are seldom the colour of the true sepia, and the water-colour sepia generally requires modification to match the tint of the picture.

BLACK TONES; SPOTS ON PRINTS.—AMATEUR writes: "Will you please inform me the way to get a black tone, also the cause of white spots on print enclosed? I find the fault is in the negative, as it appears to be full of brown specks."—If a black tone is required, we should advise the platinotype or the carbon processes. Dark purple-blacks may be obtained on albumen paper if a strong negative be employed; but in all silver processes, if dark tones are desired, a vigorous negative is essential. Gelatine papers are not well suited for black tones. The spots in the negative are evidently due to its being printed from damp paper, which has stained the negative or spotted it.

FOGGED PLATES.—R. M. writes: "I shall esteem it a great favour if you will kindly give me the benefit of your advice regarding the accompanying negatives. Do you consider No. 1 too intense, and is it over-exposed? I gave it one-fiftieth of a second with f-11, and I think No. 2 was the same. Both are fogged at the sides, No. 2 more than No. 1; both were of the same batch, and put at the same time in the plate box about a fortnight before exposure. Can you account for this?"—In reply: No. 1 presents the appearance of having been slightly under-exposed and over-developed. The plates were probably fogged before development, and the latter has intensified it. No. 1 would give a very hard print.

FORMULE WANTED.—W. C. NAPIER writes: "1. Would you do me the favour of informing me, in accordance with what formulæ the standard hydroquinone developers put up in packets dry. 2. Also I have seen 'Combined Toning and Fixing' put up in small packets dry. Could you give me the formula of a combined bath for P.O.P. which may be stored dry in packets?"—1. We are unable to give the information desired, as the Company who put the materials on the market do not publish the formulæ by which they are compounded. 2. Here, again, we are unable to reply, inasmuch as chloride of gold is a deliquescent salt. However, any of the formulæ that contain alum, lead, &c., will tone without the gold, and the ingredients can, of course, be put up as a powder.

FIXING TANKS, &c.—C. P. writes: "I use quarter, half, and whole-plates, and in fixing the quarter and half-plates in a flat 10×8 dish it is all right, as one is always fixed by the time I developed one; but, when it comes to developing and fixing several whole-plates at one time, it becomes vexatious, for I am obliged to wait until one is fixed before developing another, and I don't care to pay so much for a porcelain or rubber fixing box, as they cost about three dollars here, but I would like a cheaper yet as good a substitute. I see several washing boxes, but they are made of zinc, and hypo soda is injurious on that metal; could you suggest a cheap and serviceable one?"—In reply: Messrs. Taylor, Tunnicliff, & Co., of Hanley, Staffordshire, manufacture grooved, "granitine," plate-washers, which might answer our correspondent's requirements. They are obtainable from all dealers here.

RETICULATED COLLODION.—G. J. JOHNSON writes: "I am engaged on some fine scale work by micro-photography, using both wet and dry-collodion plates. Unfortunately a troublesome reticulation appears sometimes on the wet collodion, and always on a well-known maker's dry-collodion plate. My object is to secure the finest grain of deposit and the thinnest film. So far I have not succeeded beyond photographing distinctly 5000 lines to the inch. Can you help with any suggestions to avoid the reticulation and to secure fine deposit?"—The only suggestion we can make is to try another brand of collodion for the wet process. If the dry plates show reticulation, it is clearly due to the collodion used, and there is no remedy, as it exists in the film itself. The finest deposit obtainable is by the albumen process. In this process the image partakes more of the character of a stain than an actual deposit of silver.

STUDIO-BUILDING.—"STUDIO" writes: "I am about to erect a studio in my garden, as per illustration, which I trust is made clear to you, but am in doubt about the wall at the farther end of the garden. I should like, if possible, to place the studio at the far end, that is to say, up close to wall, as it will be more convenient. Will you kindly say if you think the wall will interfere with the lighting in studio, or if same will be best placed in the centre of garden. My studio is thirty feet long, with the centre ten feet of roof and both sides glazed, as per rough sketch following. I want to make use of the north light, so shall be extremely obliged if you will enlighten me on the above query before I place studio in position."—The wall at the end will in no way interfere with the light in the studio, indeed it will be an advantage rather than otherwise, by stopping off the afternoon sun. You can place the studio close up to the wall if you choose.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRA.

We have the authority of the *Scientific American* for the announcement that Mr. George Eastman has presented the princely sum of \$200,000 to the Rochester (N.Y.) Mechanics Institute without conditions. The money is to be expended in enlarging the present building. A year ago Mr. Eastman distributed several thousand dollars among *employés*, according to their terms of service. Our contemporary adds that "thus the people of his own city are benefited by his generosity, while the public at large derive benefit from the use of his inventions and appliances. He has been most successful as an organizer and leader of large corporations."

* * *

At the Society of Arts, on Monday evenings May 7, 14, and 21, Professor Vivian B. Lewes will deliver a series of Cantor Lectures on the "Incandescent Gas Mantle and its Use." As the subject is of interest to many photographers, we append the heads of the three sections under which Professor Lewes classifies it:—Lecture I. (May 7).—"The History of In-

candescent Gas Lighting."—The discoveries that led to the mantles of to-day; the oxides suitable for mantle-making, and their preparation; the services of thoria and ceria, and the methods adopted for their extraction. Lecture II. (May 14).—"The Manufacture of the Incandescent Mantle, and the Influence of the Process employed on the Life of the Mantle."—Manufacture by impregnation of vegetable fibres, and by moulding the oxides into thread; the recent advances in mantle-manufacture; the theory of the incandescent mantle, and the causes which lead to luminosity. Lecture III. (May 21).—"The Gas Burners employed in Incandescent Lighting."—The theory of the Bunsen burner; the adaptation of the Bunsen burner to the incandescent mantle; modern burners and their alms; the effect of the chimney; chimneyless burners; high-pressure burners; the influence of the quality of the gas on the conditions of burning; the use of water gas in incandescent mantle burners.

* * *

In the JOURNAL of February 16 we referred to the Order in Council providing that acetylene, when in admixture with atmospheric air or oxygen, should be deemed to be an explosive within the meaning of the Explosives Act, 1875. It is now stated that the operative clause in the Order is as follows: "Her Majesty is pleased, by and with the advice of Her Privy Council, to order and prescribe that acetylene in admixture with air or oxygen, declared to be an explosive by this Order, shall be prohibited from being manufactured, imported, kept, conveyed, or sold. Provided that nothing in this Order shall apply to acetylene in admixture with air when such admixture takes place only in a burner or contrivance in which the mixture is intended to be burnt. Provided also that nothing in this Order shall be held to apply to an admixture of acetylene and air which may unavoidably occur in the first use or recharging of an apparatus properly designed and constructed with a view to the production of pure acetylene."

* * *

THE shelves of the Patent Office must be well laden with specifications of patents for modes of soldering aluminium, yet

still it remains a most difficult feat, as the work might almost be called. We hear of still another patent, and, of course, it is said to be good, in fact to answer extremely well. We believe the method hitherto considered the best is still jealously regarded as a trade secret. Apart from secret processes, the great point in soldering this most difficult metal is absolute cleanliness. The parts to be soldered must be scraped or filed till perfectly clean, and then thinly "tinned" by heating or rubbing with a stick of solder. The surfaces are next brought together and the soldering iron drawn along the joint, using a small quantity of extra solder.

* * *

WE do not now hear much of annatto, which once was widely recommended for plate-backing, caramel having met with greatest favour of late, and being, indeed, an excellent agent by reason of its solubility, avoiding any difficulty in sullying the gelatine surface. It has been suggested to us lately that the well-known *dragon's blood* might be used with advantage, but we cannot see that its use would be free from the drawbacks of other powders, for, though it is soluble in alcohol and ether, it is insoluble with water. It would, no doubt, be less costly than coloured collodion, and more readily removed, but the collodion idea has been well exploded some time since. We note an ingenious method of obtaining a pure caramel by first heating pure sugar to 180°–190° C. in the usual manner, and getting rid of the unchanged sugar by adding yeast, and thus causing fermentation; but, for photographic purposes, a little unchanged sugar is of no injury.

* * *

THE question of the absorption of Röntgen rays by various metallic solutions has been investigated by Messrs. Gladstone and Hibbert. They find that, using the same acid in combination with various metals, the opacity increases as the atomic weight of the metal increases. Bromides and iodides are very opaque, and of other salts the nitrates, chlorides, and sulphates obstruct the rays with increasing strength according to the order we place them in. The opacity is not a simple function of the thickness of the layer, but varies logarithmically with the thickness.

* * *

FOR ordinary purposes, a well-made litmus paper—and there are wide divergencies of excellence and of sensitiveness in the various litmus papers sold—answers for most photographic requirements, the testing of the silver floating bath for albumenised paper being nowadays the main occasion when anything of the sort is needed, though it is still of importance where wet collodion is employed, as usually in process block-making, &c.; but, when we come to test the purity of our chemicals, a good indicator is an almost necessary adjunct. The most recent candidate for public favour is a new agent termed luteol, whose merits are extolled in an article in the *Moniteur Scientifique*, as quoted in the current number of the *Chemical News*. Our readers may not deem it necessary to know much of its chemical constitution; still, we may quote the writer, who states that luteol is "nothing else but" oxy-chlordiphenyl-chinoxaline. It is easily soluble in alkalies, alkaline carbonates, or ammonia, and gives then a pronounced yellow. The moment enough acid is added to neutralise the alkali, the luteol is precipitated and the colouration disappears, a faint white cloudiness taking its place. This indicator appears to be of marvellous delicacy, a distinct yellow being

visible when either litmus or phenolphthalein cease to indicate; and, what is of importance, the change of colour brought about by the change from acid to alkali, or the reverse, is very quick.

* * *

MR. C. G. ABBOTT, who has charge of the Astro-physical Observatory of the Smithsonian Institution, has been comparing the light from the Welsbach and other incandescent mantles with the indications given by the orlometer, so as to form an estimate of their relative efficiencies. He found the illuminating powers to differ considerably, and even the Welsbach burners were, compared with the actual energy produced, very wasteful. The greater part of the energy obtained lay on the infra-red region, where, of course, it was useless for light-giving purposes. Excluding, however, this portion of the spectrum, the Welsbach proved superior to any of the others, and more particularly in the red, orange, and yellow regions. In contrasting Welsbach burners with other sources of illumination, for a fair comparison to be made, a mantle that has been in use for some little time should be employed, for we need scarcely draw attention—at any rate to habitual employers of this light—to the fact that the illumination given by a mantle, say a month old, is a fraction only of that given off from one recently put on the burner. Whether this loss of power be due to the dissipation of one of the mantle constituents or to the deposit of iron carbonyl upon the meshes does not need to be decided, the fact of the loss of power is too true.

THE FORTHCOMING ECLIPSE OF THE SUN.

As some of the most important facts regarding the constitution of the sun are only observable on the rare occasions of its eclipse, such an event naturally holds a place of high importance in the investigations of the various astronomical associations of the world, and the impending eclipse is attracting exceptional interest on account of the central line of totality passing through regions within easy distance of our own shores notably in Spain and in Portugal. A wise preliminary precaution has been suggested, in view of past experience thirty years ago, that is, to make all possible arrangements before hand with regard to customs duties and customs officers, who of course, are known all over the world for their courtesy and consideration! We call special attention to this matter from a knowledge of the large number of individual observers who are going over on the present occasion.

The observatory of Madrid naturally offers special facilities for the work of observation, and the Spanish Government will offer every facility to foreign astronomers who may come for the purpose of observation on the 28th prox. It is probable however, that few will avail themselves of this opportunity, as Madrid is not well suited for the purpose, Naval Moral, on the Caceres line, and 200 kilometres from the capital, being far better, the period of totality extending there for two minutes.

Many observers are going to North Portugal, and will probably choose Oporto as their post of debarkation, and proceed from there to Ovar, which is close to the coast, and only twenty-two miles distant from the former town. Many reasons will deter them from choosing Lisbon, which, besides, possesses little interest to the traveller. There are no seaport towns on the west coast of Spain where the eclipse can be observed; if a coast station be desired, a Mediterranean one would have to be

elected. Eclipse observations owe the greater part of their value in recent times to the aid which photography renders, and we anticipate a large number of practical astronomers will be on the spot. They may be expected after the serious work is over to secure what views they can of popular interest, and within thirty or forty miles of Oporto lie Baetalha and Alcobaça, where may be seen what are reputed to be the most beautiful specimens of pure Gothic architecture to be found in Europe. There will, it must be remembered, be no hotel accommodation at Ovar, but easy tram and railway communication with Oporto exist. It has been stated that the fare from Marseilles to Oporto and back will only be 18*l.*, but to get to that port in France from London would need, first-class, perhaps another 15*l.*, while the fare by the Royal Mail Company's boats to Oporto and back from Southampton is only 10*l.* 17*s.* 6*d.*

It will, perhaps, be interesting to those unfamiliar with the subject to know what the professional observers will actually do when they get to work on the eclipse day. For some days beforehand their instruments will be erected, and a series of full-dress rehearsals made daily of the various operations to be carried out at the critical moments. Taking the work done by the eclipse expedition at Viziburg, as recently described at length in *Nature* by Sir Norman Lockyer, the following brief synopsis may serve this purpose. Numbers of assistants were detailed to various duties in addition to those performing the actual photographic operations. These consisted of photographs taken with a six-inch prismatic camera, with two prisms; with a nine-inch ditto, with one prism; with an integrating spectroscope and its camera; with a six-inch equatorial and a graining spectroscope (17,296 lines to the inch); and with the coronagraph. Finally, the now ubiquitous kinematograph was at work, besides a number of hand and stand cameras in charge of Mr. Turner, assisted by five volunteer observers. In addition to this, the Marquis of Graham brought with him two kinematographs—one for recording the whole phenomena of the eclipse, and another for photographing the moon's shadow as it swept across the earth's surface.

One point that renders the forthcoming eclipse of such special interest is the fact, that not until June 29, 1927, will there be an eclipse of such easy access as the present one, and in that year the east coast of Ireland and the north of England will be favoured with the sight of a total eclipse. There will, it is true, be one in 1905, visible in the neighbourhood of the Pyrenees and Sicily. We shall not be entirely without a sight of the eclipse, partial only, in our own country, for in the south-west counties the obscuration will extend to three-quarters of the entire disc, and in the Orkneys to one-half.

We may conclude our epitome of the points of interest in regard to the eclipse of May, 1900, by pointing out that at the British Astronomical Association meeting of the 28th ult., a paper by the Rev. S. W. Johnson was read, on "Suggestions for the Observation of the Partial Phase (such as seen in England) of the coming Eclipse." Among these suggestions were to search for irregularities in the dark limb of the moon, especially if any of the black disc of the moon could be seen outside the sun. At the same meeting Mr. Maunder suggested that in this country it would be very desirable to photograph the corona at the time of the greatest obscuration. To do this well it would, of course, be desirable to have a telescopic finder (with sunshade, of course), but that need not be a difficulty. It could easily be attached to a camera, and if

the latter were supplied with a tele-photographic lens, used at its utmost power, there is no doubt that at the time of greatest obscuration views of the sun and corona might be obtained quite large enough to be both of interest and observational value.

THE NEWCASTLE CONVENTION.

The arrangements for the meeting of the Convention at Newcastle-on-Tyne in the week July 9 to July 14 next are in such a forward state of preparation that it is expected the *Handbook* will be sent out to members early in May. In style and get-up the book will be more attractive than hitherto, and it will have several illustrations.

The Trade Exhibition—always a useful feature at Conventions—may be expected to be large and interesting at Newcastle. Already many important firms have booked space, and it is anticipated that the whole of the accommodation available for this purpose will be taken. Its geographical position constitutes Newcastle-on-Tyne a most important centre for photographic business, and there is little doubt that a great many visitors to the Convention would appreciate the opportunity of inspecting the latest novelties on the market.

The evening meetings promise to be unusually attractive. We have been informed that Dr. P. H. Emerson, the renowned author of *Naturalistic Photography*, will read a paper. It is expected that Mr. C. H. Bothamley (a past President of the Convention) will communicate the results of some experiments in connexion with development. Sir J. Benjamin Stone, M.P., President of the National Photographic Record Association, will address the Convention on "Record Work by Photography," a subject in which he takes such deep interest. Probably Mr. J. Bridges Lee, M.A., will deal with the important matter of metro-photography. These arrangements are not yet complete, but it is anticipated that one of the attractions of the evening meetings will be a series of photographs illustrative of the part which the camera has played in the war in South Africa.

It is only three weeks since we outlined the programme of receptions and excursions which have been arranged by our Newcastle brethren. We need not again refer to it, except to say that visitors to the Convention will be singularly fortunate in the opportunities that have been provided for them of doing photographic work amidst the historically grand surroundings which Hexham, Alnwick, and Durham, as well as Newcastle itself, are celebrated for. So far the Newcastle Executive has worked remarkably well in the matter. The London Executive, with Mr. F. A. Bridge, as energetic and thorough-going as ever, at its head, is loyally co-operating to make the meeting numerically and otherwise successful, and the entire programme, when it is issued, will, no doubt, show that the Fifteenth Convention holds out every inducement to old and new members to be present and take part in the proceedings.

THIRTY YEARS OF AMATEUR PHOTOGRAPHY.

[Paper read before the Dundee and East of Scotland Photographic Association.]
I AM not sure that I could furnish any good reason for having chosen this subject, further than that I feel somehow impelled towards it. I heartily agree with Thoreau, when he says, "I have yet to hear the first syllable of valuable, or even earnest, advice from my seniors. Here is life, an experiment to a great extent untried by me, but what does it avail me that they have tried it?"

I give no advice to the young. Photographic life is untried by them, what avails it that I have tried it? It is thankless work giving advice, and this is as it ought to be; for, when the best is said, are we not all fools to begin with, and is experience not the best teacher for us?

For over thirty years I have wandered in the pleasant highways and byways of amateur photography, and, while I make no attempt to instruct the young, I would like well to compare notes with my contemporaries, to take the bearings, and see whether the devious paths all lead to the same goal.

This is to be no mere recital of early processes and plans of doing things, no more is it to be an attempt at a humorous description of the many makeshifts that had to do duty for a proper equipment. I mean to aim at a higher mark.

First, then, I ask myself have I found what I sought when I took photography up? Do I still consider that the mistress I have so assiduously wooed for so long is worth the winning? To this question I unhesitatingly answer, Yes! I answer yes, although, to my certain

knowledge, I have never in all those thirty years, produced one *perfect* picture. It would seem that this is little encouragement to those only as yet setting out, but it is not really so. In photography, as in most of sports, the life of the thing is in the chase, and success, or capture of the quarry, means an end and ringing down of the curtain. When I think of the toilsome days, and the sleepless nights, which my hobby has cost me (not to mention the pounds, shillings, and pence at all), and then cast my eye over the handful of passable pictures I have done, my mind is apt to misgiv me, and suspicions enter my head that I might have been more profitably employed. This is a sordid and unworthy view of the matter, and I soon rise superior to it. Although the possibilities in photography were only half what they are, it would well repay one for the spending of his leisure time upon it, and, although the results in the shape of tangible entities were even non-existent, the amateur photographer would still be no worse off than the chess-player, who, like the fishers of old, toils all day and catches nothing. Judged by results, would any one say that the bush or tail of a miserable fox is an adequate return for thousands spent on a hunting stable?

I allow that the results in photography are miserable enough, even the best, but they are there, there is *something* for your trouble, and you can at least assert that you have been guilty of no cruelty to obtain them, you have selfishly sacrificed no creature's life for mere sport to yourself.

My thirty years, if they have brought me many of the happiest days of my life, have also brought me some sharp disappointments. Wonderful as the results of photography are, I have yet to see the photograph which entirely fulfils my ideal.

It may be the absence of colour, it may be the incorrect rendering of the tone values of nature, it may be the human eye which sees a something which never can be *mechanically* reproduced. I do not know, but, even on the low plane of a mere copying machine, a camera comes far behind the human hand guided by the human heart and the human head.

I am not foolish enough to maintain that a photographic reproduction of a simple subject, such as an engraving or a plaster cast is not true to nature, but the havoc which the camera and plate play between them with the subtler effects of nature are deplorable. The very minimum of information which an artist tries to convey informs you as to the kind of day he represents. The artist in black and white even can do this, and, if moderately skilful, manages to infuse a something which suggests morning, noon, twilight, or night.

Exclude blazing sunshine and snow, and who can tell from a photographic picture what was the kind of day which gave the impression.

A trifling under-exposure converts a sunny effect into the gloom and darkness suggestive of a thunder-storm, while a dungeon photographed suggests, where the light falls, beams of pure sunlight.

You meet me, of course, with the remark that these are instances of failure from incorrect exposure. To that I reply, Granted; but if such widely divergent effects are got inadvertently, and even by experts, man's short life here is insufficient to give him the cunning to infallibly seize the subtle sweet and mysterious effects he sees in nature. How many touches go to produce the effect upon an artist's canvas, and every one, without doubt, an experiment? Were it not so, why touch and touch again? It is a case of trial and error with him a thousand times repeated, for, even should he alter nothing, he builds up on the assumption that the effect is not yet correct.

Contrast this with the one *single* experiment, the exposure, in a photograph, and can you wonder that we so seldom succeed?

But you may say, There are innumerable fine photographs; how do you account for this? I account for this, or rather I reply that, fine as they are, they are, nevertheless, as dirt to the glorious effects in nature which called them into being. Let those who doubt this ask themselves. Have they made an entirely successful rendering of a snow-scape? Have they reproduced the little points of pure white, the delicate half-tones, and luminous shadows?

Or, again, have they photographed the breaking wave on the seashore, successfully rendering the tone values of the crest, the green shadow, and the blue of the sky reflected in the backwash?

"Now fades the glimmering landscape on the sight,
And all the air a solemn stillness holds."

Let the sceptic sally forth with his camera and try to seize this "glimmering landscape fading on his sight." No, no! for some reason it is beyond him if he knows enough to see it.

This, then, was the first of the serious disappointments in my photographic experience; it was, I must add, the most unexpected. Likeness to nature, "the heritage of the youngest photographer," I have as

yet found to be unattainable either by me or any other one working with a camera.

My second serious disappointment came when I discovered how futile it was to attempt to make pictures either by selection of subjects or creation of them. Selection, so far as it goes, does something for you; it should never be neglected; but, oh, how seldom does it make a real picture for you! Suppose you were to succeed, by selection of view, in eliminating objectionable features (a thing you will rarely manage), does not yet follow that a fine picture is left. People say, "Oh, nature is always beautiful!" But nature is not always notable, far less at her best, conditions necessary to render it worth while reproducing her. When I say that by selection, you may eliminate objectionable features, I do not only mean chimneys, walls, commonplace houses, or details of that kind, but I also include objectionable composition.

In this connexion let me state that the really grand photographic pictures which have come under my notice have shown little evidence of intention on the part of the artist to arrange or select. I do not mean that the pictures were in any sense accidents; I merely suggest that the real pictorial value lay in nature's arrangement, and that the part played by the artist was rather that of a discoverer. If I were inclined to give advice at all, it would assuredly be to content yourselves by playing the rôle, and to lay this thoroughly to heart, that success in photography lies almost entirely in the *discovery* of pictures, and that very, very little is left to the photographer in the making of them.

This applies with as much force in portraiture as in landscape, and it is an easy matter to pick out figures that have been posed from those who have posed themselves. Professional portraitists have made merry over the ridiculous poses assumed by those who desire to pose themselves. I am not so sure but it would be the better plan, however; and to allow an awkward fellow to pose himself would, one would imagine, give more of the character of the man. If I cannot have art and truth together, give me truth by preference. I know a particularly sedate lady, who happens to possess a very fine profile. She is straight in the back, and altogether a difficult subject to throw into graceful lines. This lady has been photographed again and again, and the usual way of getting over the difficulties of her case is to turn and twist her about, and compel her, for art's sake, to assume positions which she never, consciously or unconsciously, adopted in her life. The consequence of this treatment is that, in her portraits, she has the appearance of a giddy young thing, a painfully palpable absurdity to any one who knows her.

Of course, the sensible man says, "Oh, I would never dream of adopting such a pose in such a case." Well, if he would not do this or something approaching it, he is one in a thousand, and deserves to be encouraged. In portraiture, as in landscape, evident arrangement must be conspicuous by its absence. And what can be said of those frightful atrocities where the whole subject is made up and arranged? A moderately good-looking girl is discovered; she is clothed in a muslin rag of some kind, with a waist band and shoulder straps; she stands leaning upon a canvas fountain, a jug in one hand, a bunch of paper roses in the other; she turns her eyes devoutly upwards (why, goodness only knows) and the picture is complete. The lighting is the lighting of a studio, and she is no more a "drawer of water" than I am. Indeed, if you look closer, you will probably discover that it is not a water vessel at all she is to carry home the water in, but a terra-cotta reproduction of some ancient Egyptian urn more suitable for the custody of the ashes of her fathers. This, by your leave, is an "art study." Sham is writ large on the face of it. She is an English girl, and not a foreigner. The lighting is of the studio, not of the street; the fountain is paper, so are the roses the expression put on for the moment. Who can work up any enthusiasm over this sort of thing when, by looking closely, you can see she uses "Thingumy's" patent hair-fasteners? Of a verity this the familiarity which breeds contempt. I must know a deal less about my heroine to think much of them.

Double printing has much to answer for, and it is my opinion that it is beyond the power of man to make a connected and accurate whole from parts. It is not enough to see that the lighting is falling in one direction. The precise amount of light falling upon each and every part must also be correct, and, manifestly, this cannot be correct if you first photograph the landscape without the figures, and then the figures without the landscape, for you do this of set purpose to alter the relations of the one to the other. These have been my chief disappointments, and, although not many as to number, serious as to kind. Whether you work with pencil, brush, chisel, or other tool, the very first requisite is, surely, that your slave be obedient, for, if there be a will in the machine you use, who knows what share you have had in the joint production?

In photography, conscious, deliberate art cannot be hid. The lens is a searching tool that it lays every trick of the trade bare and painfully exposes the sham. I visit an old man in a garret, who makes a scanty living by constructing bird-cages. The walls of his little place are blacked with age and broken up by a great number of nails, nags, and hat not. The contents of his room are littered about in sweet but natural confusion. His little broken-down fireplace is heaped with unremoved ashes. He sits upon a low stool opposite a diminutive window, his long grey hair falling down in ragged, unkempt tresses over his job. He works in his shirt-sleeves, sleeves that are a perfect dream in tone from long absence from the washing tub. The whole combination is a picture, and many a time I have wished to turn my camera upon it, though this is impossible from the cramped conditions and size of the garret. I have discovered this picture. To alter or arrange in any way would spoil it. Take it as it is, and truth is stamped upon every detail; nothing is out of place, nothing is awanting. The more searching the definition of your lens, the more evident the reality. Think how impossible a thing it would be to set such a piece to bear the searching scrutiny of the lens. In the first place, these effects of light and shade are impossible in the studio. These old walls cannot be produced by other means than time and the smoke of half a lifetime. The man has been produced only after years of stooping over his bird-cages, and his grey hair falls into a natural position by the action of gravity working for a long time upon it. He handles his half-made cage in a way no mere actor could be taught to do, and the expression is of one who is desperately in earnest.

A lay figure may do well enough for the painter, who composes his picture chiefly from recollections of natural conditions stored up from previous experiences, but the photographer may have seen many cracked and walls and wrinkled old men suitable for his subject now, but he cannot work them into his photographic picture as the painter does. In case of falling back upon previous experience for the cracked wall and wrinkled face, he must, if he would make a picture of them, have them here before him; and, this being a difficulty, he unfortunately makes up something which he fatuously believes cannot be distinguished from them. I vote for truth and reality in photography as the highest art, as the only possible art. If you earnestly desire to elevate the art, arranging, and inventing, and elevating your own taste. Keep your eyes open. Whenever you come upon a little bit of nature that appeals to your artistic sense, take it. Ask no one to stand as a figure in the picture; they will show up extraneous, or worse. Bind yourselves by no rules, but let your feelings guide you. It will be no long time before experience will have taught you what you may attempt, and what not. You may be told a hundred times and forget after all, unless you try and fail. As a set-off against my disappointments, I have lived to see the advent of snap-shot photography. The bulk of snap-shots are cominable, but now and again, when circumstances are propitious, or other words, when the picture is really there to take, see what glorious results. The war correspondents in South Africa have given us one or two gems. Looking at them, even in the cheap reproduction by process lock, one has sometimes a doubt whether, after all, they are not copies from some fine old works of art. I am not referring, of course, to the violent elaborations from photographs which one sees in every journal, but to the genuinely untouched snap-shot.

And now, as a wind up, let me say a word or two on small matters. Thirty years of experience have littered up my den with cameras of all kinds and sizes. It has filled my shelves with countless books on the subject; it has crowded every available corner with tripods, rolling resses, burnishers, and I know not what all besides; it has left me with chemicals enough to stock a laboratory; and all this to no purpose now. I have learned wisdom, and I have paid the price. My working plant now is simple enough. I have a light stereo camera, with four double dark slides. I have a light alpenstock tripod. I have a dish or two. I have a small vial of dilute ammonia and bromide, and a jar of hypo. I have a couple of stereo printing frames, a few pieces of sensitised albumenised paper, and a small stock of mounts. I think, with horror, of the terrible loads I used to shoulder; with horror of the vast accumulations of prints, apparatus, and material I had to find room for. Never again shall they hang round my neck, like the old man of the sea. They were my willing slaves and companions in many a long summer-day's outing, and I have a kindly feeling towards them; but it is all over between us, or all that. They will not be parted with; they will have house room; arefully tied up and put snugly away.

As I began with a quotation from Thoreau, so I end with him, and side with him when he says, "When I see a poor labouring man, staggering along with all his possessions in one bundle on his shoulders, I

do not pity him for having so little, but commiserate him for being burdened with so much."

I look back to the days of my youth and innocence with longing, when my kit was so simple that a soap-box easily contained it all. I was free then, with a freedom which bade me a long good-bye as my photographic flocks and herds (so to speak) increased a thousand fold.

J. K. TULLOCH, M.B.

PHOTOGRAPHIC CRITICISM.

In *Camera Notes* for April, M. Robert Demachy, the eminent French photographer, submits the following ideas on the subject of photographic criticism: "Ten years ago criticism on photographic exhibits was an easy thing indeed. Any sort of photographer could write four columns of mixed praise and blame; and, after having digested this, the reader knew exactly what to think of Mr. So-and-So's work, for the scientific critic had told him on what paper the negatives had been printed, how deep, and in what colour. A short paragraph on the marvellous definition, the crisp high lights and well-detailed shadows, and a line or two describing the subject, completed a criticism that left nothing to be desired. The next exhibit would perhaps be considered disgraceful, over-exposed, unequally toned, slovenly focussed, &c. This time not a word on the subject itself, but—'what were the Judges thinking of when they admitted a photograph taken with a lens that did not cover more than two-thirds of the plate?' and so on. At that time exhibitors did learn something from the critics. They knew when their work was bad, and they knew why. So they hurried to Dallmeyer's to buy marvellous lenses; they worked out abstruse calculations with pencil and actinometer; invested in new measuring glasses and patent scales, and finally turned out the perfect negative, yielding a perfect print. And they were happy and contented, because their work was good; they knew for a certainty that it was good, and that no photographer worthy of the name could say it was bad, or imagine anything better.

"Things are changed nowadays. We can never be really satisfied with our work, for there is no limit to its improvement; and our critics, who are not satisfied either, do not seem to know why and wherefore, if I may judge from most of the articles it has been my lot to come across.

"Photography, or, to speak more correctly, a certain number of photographers, have taken up a new line. Their goal is different from that of their predecessors; their standards of excellence are borrowed from those of other crafts, and yet their Judges remain the same. If a surgeon used his scalpel to carve a statuette from a piece of oak, would the Royal College sit as a jury and ponderously examine his work from a medical point of view? This is, however, the sort of thing we have to submit to most of the time. It is worse, indeed, for us poor photographers (pictorial photographers, we call ourselves, for life is precious, and we keep clear of the word 'artist'), who stand under cross fires, abused by our community and slated by illustrious painters, who seem to write more often than they paint. We have lost Mr. Gleeson White, whose straightforward criticisms, founded on clear and sound reasoning, gave precious lessons without causing offence. His place has not yet been filled, and now nearly all critical articles on photographic exhibitions teach photographers nothing, and leave them either indifferent or confused in their minds.

"For criticism does not consist in telling a man that his model is bandy-legged, or that his landscape would look better if it was hung upside down. Of course this is very witty, but it has nothing to do with criticism, for a critic ought to speak like a sort of doctor, who diagnoses the disease and points out the remedy. To be able to do this he must have studied both, and made a careful examination of the patient himself.

"Do our photographic critics proceed in this way? I have seen some of them at work, rushing through the exhibition rooms notebook in hand, and their eyes fixed downwards on the point of a rapidly scoring pencil, in tow of some panting organizer; indeed, I have played the part of the tug-boat myself, and viewed the proceedings from a closer position. But let it be understood that I have met a few exceptions to the rule—rare ones, it must be owned. These men worked several hours a day, for three or four days, on a hundred and fifty pictures each. They knew these pictures so well that they could have drawn a scheme from memory of every one, and they hated the very titles of them for weeks afterward. But their criticism had weight. It might be disputed, but at any rate it was founded on patient study, and it gave sound reasons for its verdict. Criticism of this order is never offensive and unkind. It does not aim at being satirical or funny. The little pin scratches, and the little jokes of

the genuine critic, even if they are perpetrated in a moment of irritation, do not stand the polishing process, or they vanish later on under the stroke of the red pencil. This sort of criticism makes photographers look at their work with other eyes; I have often met men who laughed at such or such a suggestion offered in a serious and polite style in the course of one of these articles, but, through a mysterious coincidence, it happened that this very suggestion was accurately carried out in their next production, which looked all the better for it.

"Our critics, nearly all of them, have adopted a very useful exordium, which will conveniently fill up a column and a half, and will leave a deep impression on the easily convinced public. It is generally headed 'Photographs that are Not Photographs,' and the curses of Daguerre are called down upon men who 'imitate' wash drawings, charcoal drawings, or aqua fortis. But nothing has ever prevented artists in monochrome from using our dirty black, purple violet, or sickly brown tones for their pictures. It seems to me that if they choose lampblack, India ink or sepia, it is merely because these colours give a very superior artistic effect, and for no other reason. And yet we should be ordered to keep to our old silver tones and effects, just to please Daguerre—whose metallic-surfaced prints, by the way, had no earthly resemblance to the gelatino-chloride outrages of to-day.

"After this exordium comes the question of brushmarks in bichromated gum prints, treated in such a way that we believe the critics are under the ridiculous impression that brushes are really not needed in developing gum bichromate, but that they are purposely dabbed all over the print just before framing, to try and get the effect of oil painting.

"Further on we come across the names of Rembrandt and Van Dyck, Velasquez, and Rubens, and other demi-gods, and the learned critic takes some pains to impress us with the patent fact that our photographs are far from equalling the work of these celebrated painters. But if we are suspected of having studied their composition and their treatment of light and shade, a thing that every painter does, we are accused of imitation and lack of personality.

"Finally, we are severely warned that a photograph ought to be a photograph and nothing else. Now, this sounds very fine, and at first sight appears to be very clear. But what is a photograph? How shall I know a photograph from something that is not a photograph? A simple-minded man would answer: 'A photograph is an image produced by means of a lens or a pinhole, and fixed on some medium or other by means of a chemical reaction caused by light.' But this answer does not explain matters satisfactorily, for pictorial photographs are produced in this very way, and yet they are often accused of not being photographs. Is a photograph to be recognised by its aspect only? Then, which is the photographic aspect? A print on albumen is quite different from a Daguerreotype, and has nothing in common with a platinum print; carbon does not look like gelatino-bromide, and chloride paper has a different aspect from tin-type. Which style are we to adopt if we want to glory in the name of photographers?

"Perhaps the critics mean that a photograph is undoubtedly a photograph when it is printed on a distinctly inartistic medium, highly glazed, and when it represents a subject utterly devoid of composition, offensive in tone and false in values. This might be the true reading of the enigma, but then we must admit that the critics encourage us to produce detestable work, and this is impossible, of course.

"All this is very confusing, and yet it could be made so clear. Why do not critics admit that a photograph can be of any sort of colour, printed on any sort of paper, developed by any sort of means, sharp or fuzzy, light or dark, provided it is taken with a camera and printed from a negative? Then let them divide photographs in two classes, the technical and the pictorial, and judge the work of a man according to the end which he pursues, not according to fixed rules and standards that have been invented in other times and for other purposes. If the critics come across a print of a new and disconcerting aspect, instead of saying 'this is not a photograph,' let them understand that it is only a photograph different from other photographs, just as salted paper was considered very different from Daguerreotype in the old times. And, lastly, let them give us good reasons for their praise or for their blame, reasons that may encourage us on the road we have chosen, or teach us what we are to avoid in the future."

THE NATIONAL PHOTOGRAPHIC EXHIBITION.

ABOUT sixty firms of photographic manufacturers, &c., will be represented at the Second National Photographic Exhibition, which will be held at the Portman Rooms, Baker-street, London, W., from Friday next, April 27, to Saturday, May 5. It may therefore be anticipated that a

large and varied display of photographic apparatus, material, and "appliances"—a truly comprehensive word, according to Mr. Justice Kekewich—will be on view, and that the visitor, be he professional, amateur, or trader, will see everything that is new and noteworthy in the way of manufactured productions designed for use in the taking of photographs. The Exhibition is fixed at a time of year when the interest of the public and consequently that of the trade, in photography is at its keenest, and the Portman Rooms are so accessible from all parts of the metropolis that a large attendance may assuredly be counted on. During the fortnight there will be many daily attractions in the shape of lectures on X-ray photography, colour photography, cinematography, liquid air, telephotography, and other subjects, by Messrs. T. C. Hepworth and Cecil M. Hepworth, and the Imperial Band will also frequently perform. Thus the Exhibition promises to be a pleasant place for the photographer to visit. We wish it every success.

FURTHER HINTS ON P.O.P. MANIPULATION.

THE writer's article entitled "P.O.P. Manipulation," which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY on January 5, 1900, having elicited several inquiries upon points which he did not at first think it necessary to touch, perhaps the following supplementary remarks may be useful to those who have had no previous experience of P.O.P.

P.O.P. is what is technically known as an emulsion paper; i.e., an emulsion of the sensitive silver salts is prepared in a colloid, which is then spread upon the paper. The colloid used for P.O.P. is gelatine in a more or less hard or insoluble state, whence the emulsion is known as gelatino-chloride, and, by reason of the fact that water and heat combined dissolve gelatine, P.O.P. prints cannot be dried off with blotting-paper or by the action of heat, neither can they be hot burnished; the prints also require a little more careful handling than albumen while in the wet state, as they are rather tender, especially in hot weather, and, if they are washed in a rotating washer, a very great force of water should not be employed.

P.O.P. is supplied by the manufacturers in the usual sheets, and various standard sizes, besides which they will always cut odd sizes in quantities; but photographers who do a very varied trade do not find it convenient to buy all their sizes ready cut, as it sometimes means keeping a very large stock of paper; so they buy the sheets and cut them as they require. When this is done, the fingers should not be in a hot and moist state while handling the paper, or finger-marks and lines will be left upon the finished print. These will generally tone redder than the other parts of the picture. If the hands perspire freely, common white cotton gloves should be worn during the operation, when the paper may be handled with impunity. Still, if ordinary care is used while handling, no more trouble should be experienced in cutting P.O.P. than in cutting albumen. P.O.P. may be exposed for a short while to subdued daylight while cutting, but, if left for any considerable period, discolouration may take place, as the paper prints rather quickly. Ordinary gaslight, incandescent electric light, or candle light, have no effect upon it, but the light of incandescent gas, acetylene gas, or the electric arc, will discolour it, although usually it requires a considerable exposure unless the lights are very strong.

When a tube, box, or packet of P.O.P. is first opened, if the edges are discoloured, even if only slightly so, it may be taken for granted that the paper has been manufactured some considerable time.

If P.O.P. prints are not squeegeed down, a good way to dry them is to thread some common wooden paper-clips (which can be obtained commercially at about 6d. per dozen) upon a string, hang the string across the room like a clothes line, placing in a draught if possible, clip each print by the corner, and leave until dry. The only disadvantage about this way is that the corner by which each print is clipped must be cut off, as the wet film sticks to the clip. Perhaps an even better way is to have a small wooden rod suspended across the room, and pin the prints to this by the corner, leaving them to hang, thus only a pinhole is left, and this may be so close to the edge that it is removed in the final trimming. The writer has tried hanging a string across the room, and simply laying the prints over this, film outwards, in the same manner that clothes are sometimes hung, but he finds that there is usually a mark left across the print where it has hung over the string, and which often shows up when mounted.

It is very important that P.O.P. should be kept in a dry place until it is required to be used, as it keeps very much better in a dry state. If the place where it is kept is damp, it should be placed in a box at the bottom of which is some common chloride of calcium. This greedily absorbs moisture, and, when it gets damp, it may be dried by the action of heat, and used indefinitely. The length of time that P.O.P. will keep is largely determined by the way in which it is stored. The best way of storing it is undoubtedly to keep it in a flat state under some pressure, and covered with clean brown paper to exclude light and air as much as possible, for access of the latter quickly discolours it. Where sheets

ave to be stored, it is rather awkward to keep them in a flat state, so they should be tightly rolled and kept in the tubes supplied by the manufacturers, and covered with the damp-proof paper as also supplied by hem. It is not advisable to keep P.O.P. for any great length of time if it can possibly be avoided, but sometimes, through circumstances over which photographers have no control, such as living in remote districts or fluctuations of business, it is necessary to keep it for some little time, and then a little care will keep it in good and workable condition for a few months, where neglect will spoil it in as many days. P.O.P. should not be left lying about exposed to the air, as this quickly discolours it even in a dark room, and particles of dust, more particularly if they are of a metallic nature, settle upon it and leave black spots upon the paper. These are often very small, and usually appear as if ink, or some other black substance, had been splashed upon it; and, although this difficulty may be overcome to some extent in the shadows, in the high lights they are very troublesome.

There is very little difference in most of the commercial P.O.P.'s, although some photographers can work best with one brand, while another photographer cannot get on with it at all to his satisfaction; still, a good photographer should get good results with any good make. Most P.O.P.'s have some little peculiarity which one photographer seems to manage better than others do, and this probably accounts for the fact that one photographer swears by one particular brand, and declares that it is the best, while another is equally convinced that some other make is the best, and the one used by the former photographer is no good, when, as a matter of fact, the only difference is in their methods of working, which are more adapted to the particular brands they affect.

In trying various P.O.P.'s, it will be found that some kinds are very much thicker than others, this sometimes occurring with different batches from the same maker. Many photographers are under the impression that this is due to one film being thicker than the other, and in their opinion better; but such is not the case, and it would be almost impossible to make such a marked difference with the film alone, and would never happen with the same manufacturer, as the machinery by which P.O.P. is coated practically ensures that it cannot vary in thickness, for with this machinery it is very difficult to lay an abnormally thick coating of emulsion upon the paper. The difference is caused by the variation in the thickness of the baryta substratum with which the raw paper is coated previously to receiving the emulsion, and it makes no difference to the print itself whether the paper is thick or thin. The thick paper has the advantage that it is perhaps not quite so liable to tear when wet as the thin paper is; but one great disadvantage is that, when thick paper is mounted, it projects very much above the mount, and looks rather unsightly, besides which, in quantities, there is a difference in packing as well as the cost of carriage, for baryta is a very heavy substance.

C. T. SUTTON.

PHOTOGRAPHERS AND THE ILLUSTRATED PRESS.

THE ILLUSTRATED PRESS: A NOTE.

THE reading public ought to be fairly well supplied in the matter of illustrated weeklies soon. The *King* and the *Sphere* have come to swell the ranks. Long life to them will be the wish of most, although some may consider that the market is already crowded. Certainly the competition is keen; but the reading public is always increasing.

There is one feature concerning Messrs. Newnes' new weekly which will appeal to journalists as contributors, and that is, it is announced that payment will be made for contributions on acceptance. Few existing journals adopt this policy. The methods adopted by certain journals is certainly not a credit to journalism. There is one pretentious journal which manages to exist on something very much approaching misrepresentation, to put it mildly. An intimate friend did a considerable amount of work for it, and invariably had much difficulty in getting payments. Before breaking off his connexion with it, he sent a number of photographs to it, which were accepted for reproduction. A price was agreed upon, and the photographs duly appeared, but enlarged to about four times the original size. Months went on, and no payment was forthcoming. But this particular journal is still in existence, and some of the leading photographers allow their work to be reproduced in its pages. Doubtless they are paid promptly enough, and, as they probably belong to the Copyright Union, they would not charge a less reproduction fee than half a guinea. If a journal cannot deal honourably with its contributors, why should it exist at all?

That photographers can increase their incomes by allowing their work to be reproduced in the respectable illustrated journals is undeniable. A young professional of the writer's acquaintance made over 30*l.* in this way in one year simply in his spare time. There are many firms, of course, who make a speciality of presswork, and a fairly long list of individual photographers might be given who are practically journalists though photographers.

But one or two of the existing journals should be avoided, i.e., if you desire something more remunerative than merely seeing your photographs published and your name in print.

PHOTOGRAPHS versus DRAWINGS.

Photographs versus drawings is a matter just now receiving a considerable amount of attention at the hands of those connected with the illustrated Press, and it is a question probably not without interest or importance to many of the readers of this JOURNAL. The writer has more than once seen it asserted in prominent publications recently that the illustrators are viewing with alarm the increase in the number of reproductions from photographs which find a place in the illustrated journals. It needs no pointing out at this time of day that the photographer cannot be ignored by the illustrated Press. At the same time, no one, I think, would care to see the black-and-white man ousted altogether. Photographs generally probably can appreciate a good drawing as well as a good photograph. "Art and Actuality" is the motto of one of the prominent illustrated weeklies, and a judicious blend of photographs and drawings probably finds most favour with the purchasing public.

In a paper such as the *Daily Graphic*, where it would be commercially impossible to employ art paper, a line drawing is preferable to a smudgy photo block, although where there is no great detail, as in a portrait, a photo block can be satisfactorily reproduced.

In connexion with the general question, the following notes written by the contributor of the "Art Notes" in the *Pall Mall Gazette*, who is no mean authority, may not be without interest. He writes:—

"Somebody has estimated the increased sale of the higher class of illustrated journals since the beginning of the war at one hundred thousand copies, and there is no reason why the estimate should be extravagant. Not only are the bookstalls crowded with excellent illustrated matter, but there seems a ready welcome for every new comer. From the artist's point of view, the one depressing fact is the enormous preponderance of photographic blocks. The public want pictures, but are no longer to be taken in, apparently, by the imaginative 'war artist,' whose knowledge of battles was often confined to the weekly bout with his landlady or his washerwoman. Sometimes these stirring *tableaux* were done from sketches more or less authentic, but a vivid imagination and a handbook of the British Army were more abiding aids. Now, in the uncompromising craze of the day for reality, the photographer has gone to the front—into the fire zone, even—and the result, if not so imaginative, is vastly more interesting. Two of the latest new illustrated weekly papers differ essentially in their choice of the old and new methods of war illustration. I would like to say that the artists score off the photographer, but they do not. The public want the facts as near as may be, and are too deeply stirred to be put off with melodrama. The *Charge of the Lancers*, done (in St. John's Wood) with a fine artistic instinct, has no chance against the much more prosaic picture by the photographer, *The Black Watch Advancing in Open Order at Magersfontein*, or *The Men of the Suffolks Preparing their Christmas Dinner*. And why should any artist grudge the photographer his success? A 'news block' (to use its technical term), reproduced from a photograph, is the 'penny-a-line' illustration of journalism, and, however interesting, has nothing to do with art. The 'living picture' of the biograph and the dead one so common at the Academy are not more divided in purpose or execution. When unthinking people say, 'I prefer a photograph to an illustration,' they compare things that have no possible ground of comparison. We ought to welcome the photographer in the newspapers, for he teaches a number of lessons that the public is otherwise slow to learn, and we need not regard him as the supplanter of the artist. Truth to tell, illustrations of stories and incidents in which the artist is tied down in theme and treatment can rarely be dealt with seriously as works of art. Occasionally the artist rises superior to his limitations; sometimes the subject evolves the man, but, generally, we are all too ready to class as 'art' that which has no relation to it. Because a number of estimable young men who do not like office work have taken to pencils rather than to pens, we are asked to call them artists and to be generous. There is only one consolation. If the draughtsman is rarely an artist, the photographer never is an artist."

Some of the papers are not disguising the fact that they are relying mainly on their photographers, and a glance at the periodicals in question will readily confirm this.

Now let us hear what Mr. Clement Shorter, the editor of the new comer, the *Sphere* has to say, and no man is able to speak with greater authority on all matters appertaining to illustrated journalism. He says, "My ideal newspaper—at any rate, at sixpence a week—is assuredly not a journal entirely composed of photographs. . . . I am inclined to think that we are on the eve of a great reaction, and that the sixpenny illustrated newspaper composed almost entirely of photographs has but a very poor future. Photographs are cheap, the general effect cannot be other than monotonous, and it does not seem to me that, as compared with newspapers which employ good black-and-white artists, the public can be considered to get a very good sixpennyworth for their money. I do not mean to say that there is not plenty of room for photographic journals; it is merely my contention that they could be done much cheaper than at sixpence. . . . I wrote an article on 'Illustrated Journalism' in the *Contemporary Review*, I declared that the essential thing to recognise was the limitation of the photographer and the limitation of the artist. Your photographer can do many things better than the artist, he can give a sense of reality to many an incident that the most accomplished

artist will fail to do, but there are a hundred occasions on which the photographer utterly breaks down; at a royal wedding or a royal funeral he is entirely out of place; he may not enter Westminster Abbey, and, were he to do so, the results would not be very satisfactory." Mr. Shorter goes on to say that it is true that on the battle-field the photographer can do much, mentioning what arrangements he has made to be supplied with photographs from the front. I think it will be admitted that here we have two interesting opinions which fairly cover the whole ground.

It must, in justice to the photographer, be pointed out that not infrequently a very effective drawing is made by the black-and-white artist from a photograph. In some cases it is quite possible that, through one cause or another, it may be impossible to reproduce a photograph depicting an important incident of the war. Through insufficient exposure or other cause, it may not be possible to make a reproducible block, but sufficient detail may be shown in the photograph to give the artist material for his picture. Surely an editor, who claims that in his journal only actual photographs are reproduced, would fail to take advantage of the black-and-white artist in this case. Actuality need not necessarily be sacrificed.

A COPYRIGHT NOTE.

If a contributor obtains from a photographer photographs for reproduction, an interesting point to be considered is, should the contributor in question pay the reproduction fees before the photographs have been reproduced? To illustrate this point I give an instance. Some months ago a contributor to one of the magazines obtained a number of photographs from a worker who has made a speciality of a certain subject. The photographs (and accompanying matter) were accepted for reproduction in the early autumn of last year. They have not, however, yet been published. The photographer in question, desiring his fees, writes to the contributor referred to for payment, and, there being several photographs, this is not an inconsiderable amount. He claims that it is nothing to do with him as to whether or when the photographs are published, or, indeed, whether the photographs are published at all, for we can, for the purpose of argument, assume the possibility of the journal in question failing before the photographs are published, which, in these days of competition in illustrated journalism, is not an impossible event. The contributor is willing enough to pay the ordinary price of the photographs, but does not feel disposed to pay the photographer his reproduction fees until the photographs have been actually reproduced, for the contributor does not benefit, at any rate only indirectly, by the publication of the photographs. If the photographs were not used by any chance, the question is, is the contributor still responsible for the payment of the reproduction fees? It seems rather unusual and unreasonable that the contributor should both find a possible market for the photographs and have to take all the risk. If the photographs are published and paid for, it is the photographer who will benefit to the greater extent.

J. A. REID.

EXPERIENCES OF A PHOTOGRAPHIC DEALER.

"He is a jolly nice fellow, but a poor musician!" This is a German saying, well understood in the Fatherland. This might be varied in the case of a great many amateur photographers—"He is an excellent musician, but a terribly poor photographer!" There is Mr. Harmonicus, for instance, professor of music, an authority on organ-building, but his knowledge of photography is of the most primitive order, in spite of his having invested some years ago in a well-advertised quarter-plate camera. Music he has at his finger-tips, but the focus of a lens is still a hidden mystery to him.

When the musician called on the dealer the other day, he incidentally mentioned that he was writing an article on "The Construction of the Piano," illustrated by some drawings, and wanted to know whether the drawings were fit for photographic reproduction. On being shown the drawings, it was pointed out to him that the paper they were done on was too yellow to yield a good result by photography, and that finger-marks would be painfully evident in the negative. He then mentioned that he was the possessor of a camera, but never could get on very well with it; could not get the picture sharp, and the negative went black all over in the development. It was suggested he should fetch the camera, as it might be possible to find out what was the matter with it. It was accordingly submitted for inspection. The owner had no idea that the lens moved in the focussing jacket, and knew nothing about stops. He didn't know he might reverse the slide, and take vertical as well as horizontal pictures. So far he had only used the slide horizontally. This was probably the result of having purchased the apparatus at some store, where no attempt would be made to explain the various parts of the apparatus to him, the business idea being simply to price the article down at the lowest that the proprietor would permit, and take the cash. Whether the apparatus was in order, or understood by the purchaser, was farthest from the saleman's thought, the only idea in his mind is another "line," get the money and put the sale down on the sheet. The owner of the camera had, in fact, not mastered even the rudiments of photography. After the various movements of his instrument had been explained, he left, supplied with a dozen quarter-plates and twelve ounces of developer (hydroquinone), in two bottles, labelled No. 1 and No. 2.

The day following, our amateur turned up again, somewhat annoyed, and said: "Look here! the plates you sold me yesterday were no good at all. I exposed several, and developed them, but could not get anything out at all; and, to test the matter, I took the others out into the light and looked at them, and, from what I see, I don't think they are of the right colour." The dealer assured him the plates were all right, and, as he had been sold an unbroken box, he might depend upon it that they had not been tampered with. To convince him, the dealer invited him into the dark room, and showed him an unexposed plate, and then took him into daylight to compare this plate with those he had brought back, and so convinced him there was nothing wrong with the plates. The dealer inquired what exposure he had given, and was told about three seconds (this was in the middle of the summer). It was at first a puzzle why the professor had not succeeded with his plates; but, when he turned to the dealer and said, "Do you mix the two solutions for development?" the explanation was not far to seek. The dealer's reply, "Of course; didn't you do so?" brought the answer, "Oh, no, I only poured the solution from No. 1 bottle over it, and, when nothing came out, I put it into the fixing bath, thinking it might come out afterwards, but it didn't."

After explaining that the solutions have to be mixed in equal proportions before development, he invested in another box of plates, and went away a wiser and more determined man.

Next day the professor turned up again with two terribly fogged and out-of-focus negatives, and wanted an opinion of them, and whether they could be printed from. The defects were pointed out, and he was told they were no good at all, and, to illustrate this, a good negative was shown him. He saw he was hopelessly out, and the two negatives he had brought went promptly, where all bad negatives should go, into the dustbin. However, he had with him two more exposed plates, and asked for them to be developed in his presence. This was agreed to, but they turned out worthy companions to those he had developed, being out of focus and badly fogged. After putting several questions to the professor, as to his dark-room, light, keeping the focussing cloth over the camera when drawing out the slide, &c., it was found that he did not possess such a thing as a focussing cloth. To demonstrate to him the use of a focussing cloth, we went into the garden, taking a stock camera, and, after posing the professor, with some shrubs as background, exposed a plate, which, when developed, yielded a good-quality negative. This the professor took, without waiting for it to be washed or dried. So much for the dealer's work, and this is the last that has been seen of him for any business purpose. It is supposed he has been more successful since, and so does not need the "advice" of a mere dealer in photo goods.

"Do you keep Snook's combined toning and fixing bath?" is a customer's question at 9.45 p.m. (The dealer lives in a somewhat busy and late neighbourhood). "No, we do not," is the reply, "but perhaps you may get it at the pawnbroker's and photographic dealer's lower down." "Oh, no, they don't keep it, I have been there already." "Perhaps you may get it at the drug store," was the dealer's reply. "They were just shut up when I got there" was the reply. "Why not try the chemist a little higher up," the dealer ventured to suggest. "Do you think he is still open? You see, it is not for myself, but for a friend of mine. I generally get mine in town, at So-and-So's stores. Sorry to have troubled you." "Oh, don't mention it," the dealer replies. "Good night, sir."

"How much are those whole-plate porcelain developing dishes?" is another customer's query. On hearing the price he suggests he ought to get them a little cheaper if he took two of them. It is agreed to make a reduction of sixpence if he takes two. "Well, I shall not want them just now, I'll look in at the end of the week." Thus the dealer draws another blank.

Now and then our friends the photographic chemists are at fault, and their chemical knowledge is rather at sea as far as photography is concerned, for, being in want of some potassium ferridcyanide, the dealer in his turn called at one of the local chemists, who also sells photographic materials and chemicals, and asked for an ounce of potassium ferridcyanide. The assistant hunted high and low for about ten minutes, and, being unable to find any, told the dealer he did not think they kept it in stock, as it is so seldom used. When told that it was almost in daily use for reducing negatives, he replied: "Oh, we generally reduce our negatives with bichloride of mercury!" On being challenged on this point, he admitted that he had made a mistake, but imagine the position of the poor amateur who takes such advice. It is to be hoped that photographic chemists do not generally speak with such authority if they are in doubt. A bread pill is a safe prescription and a little liquorice compound harmless, but picture the face of an amateur photographer who tries to intensify his already too thin negative with potassium ferridcyanide, and sees it disappear altogether; or, on the other hand, to reduce the under-exposed and over-developed one with bichloride of mercury. That face will pale by degrees as his negative gets whiter and whiter, and then another will be added to the collection of spoilt negatives. The experiences of the dealers is, as a rule, willingly and cheerfully placed at the disposal of amateur and other photographers, and it is only fair when this is so that the services should be appreciated. In the old days a substantial fee was charged for instruction in photography, but with competition, and very severe competition too, came the announcement, "No charge for instruction" to purchasers of apparatus. This being so, it is only right and just that the matter should be reciprocal, and if a dealer gives the photographer in-

formation that is useful to him, and helps to turn failure into success, he should, if he does not see his way, or hesitates to pay, directly for the information, make it a matter of honour to buy what he wants in future of him, or as far as he possibly can, so that there may be a *quid pro quo*. The dealer, no matter how he may be interested in his business and love photography as an art, keeps his place open to endeavour to get a living—for the rates and taxes fall due whether customers or other photographers' negatives turn out faulty or not.

Hypo.

INVISIBLE STARS.

In a recent lecture on this subject, Sir Robert Ball, the Astronomer Royal for Ireland, made the following eloquent remarks to his audience: Go out on a clear night and raise your eyes to the sky. There you see shining above you some bright and beautiful gems, and many hundreds of small stars. Next get an opera-glass to strengthen your view, and immediately the number of visible stars would increase tenfold. There they lie in profusion, from the brightest glories of the firmament down to the feeblest points, whose twinkle you can only just discern by glimpses. Make now a supreme effort to sound the depths of the universe to the utmost extent to which our faculties are capable. Call to your aid the experienced engineer and the skilful optician; bid them construct the mightiest instrument that their combined talents can fabricate, convey your telescope to the summit of a lofty mountain, under the purest and most translucent sky which this globe has to offer, and then on the clearest and darkest night place your eye to that magic tube. There are displayed a host of sparkling points, innumerable as the sands on the seashore, and so faint as to be only just discernible when our vision is strained to the uttermost. Are we to suppose that even under these circumstances we have seen all the stars of heaven? We have seen but the merest fraction of them. Out beyond, out far beyond that star dust, which is the last thing our mightiest telescope discloses, lie stars and systems of stars, which no human eye has ever seen or ever can see, even when every aid has been invoked to strengthen the senses with which nature has provided us. These are the invisible stars. There is a peculiar difficulty in photographing the stars, with which every practical photographer will sympathise. The sitter will not stay quiet. We cannot arrest the diurnal movement of the heavens; but what we can do is to cause the whole apparatus to move smoothly and regularly so as to follow the stars. No machinery could be relied upon to carry the plate forward with the precision which is necessary for a perfect picture. Its performance must be checked by the incessant attention of the observer who is seated at his post. By gently turning a handle to or fro he can so control the machinery that each star shall be kept at the same point of the plate for hours, until at last a perfect picture rewards his patience. My esteemed friend, Dr. Gill, her Majesty's Astronomer at the Cape, has sent me, for the purpose of this lecture, a superb plate which he has taken of the most famous star cluster in the heavens. In the centre lie a mass of stellar points so close together that you can hardly distinguish them separately, while all around are multitudes of the outlying stars belonging to the same system. A few minutes' consideration will, I think, show that never before has a more majestic spectacle been inscribed within the four corners of a photographic plate. A globe resembling our earth, complete with all its continents and all its oceans, would be an utterly imperceptible object if placed among the glittering points in that system. Those stars are suns of stupendous magnitude and gorgeous lustre. It is possible that, among so large an audience as I am now addressing, there may be some colour-blind people. The normal human eye will distinguish the seven colours of the rainbow, the red, orange, yellow, green, blue, indigo, violet. If, however, you had an ordinary photograph plate at the back of your eye instead of that marvellous retina, the red in the rainbow would be discerned but feebly, you would begin to see the green and the blue much better, the violet would seem brighter still. The most vivid hues would be in the inner part of the arch, which to the ordinary eye appears to be quite devoid of tint, but is, nevertheless, painted with many particular kinds of light to which the photographic plate is peculiarly sensitive. If we could imagine

photographic plate to express its candid opinion of the visual powers of the human race, it would say that every man, woman, and child among us was most miserably colour-blind; for the sun and every star pour forth a multitude of beams of light. Some of those beams belong to colours which we can see, others consist of the invisible light which can affect the photographic plate. Modern research is gradually making us in some degree acquainted with the marvellous complexity and interest of this thing which we call light. How wondrous is the subtlety of that mysterious ether which fills the firmament. At one time it can tremble with ripples no more than the ten-millionth part of an inch in length, and at another time it can roll with ethereal billows which measure a thousand miles from crest to crest. Our eyes show us a few vibrations in one particular region, photographic plates disclose a few other vibrations, while yet others are exhibited to us in the splendid experiments of Hertz. Had we eyes to which this Hertzian light was visible, we should be able to see through stone walls with the same faculty as we can now see through glass. It sometimes seems to me that our eyes are as inadequate

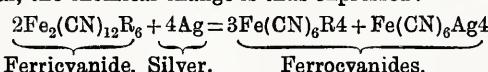
to interpret fully what the sun dispenses as would be the ears of a man who could only hear the beating of a drum when attempting to listen to an orchestral performance of a symphony. The solemn tones of the organ, the exquisite delicacy of the stringed instruments, would strike no responsive cord within him. Almost equally imperfect are our eyes for the interpretation of those marvellous radiations which the sun sheds abroad with such prodigality. His beams really contain a vast orchestra of vibrations, of which our eyes can only disclose to us a couple of octaves. At certain places within the mighty compass of the instrument we can devise a photographic plate or a Hertzian resonator to astonish us with a few additional octaves, but of the full volume of the harmony we are almost entirely ignorant. When we think that the other suns in space, to the number of uncalculated millions, are each of them simultaneously filling the ether with its particular orchestra of vibration, when we think of the marvellous way in which that medium transmits those delicate movements throughout the length and breadth of this universe, then, indeed, we begin to realise the sublimity of those words uttered in the beginning, "Let there be light."

TONING WITH FERROCYANIDES.

[Translated from *Camera Obscura*.]

THE first use of ferrocyanides as toning agents was the process of uranium intensification published by Selle in 1866. In 1867 Eder and Toth, in *Photographische Correspondenz*, gave the theory of this process, which, as further described by Stieglitz in 1895, and afterwards by Valenta, is widely used at the present time in various commercial solutions. I recently undertook the study of this question from both the theoretical and practical sides, the results of my labours having been communicated to the French Photographic Society in January 1899.

I may first refer here to the use of ferrocyanides for toning purposes in general before I proceed to give practical details. If an image in metallic silver be immersed in a solution of a metallic ferricyanide, the result is the formation of a ferrocyanide of silver and of the metal originally combined with the hydro-ferricyanic acid. Thus, if R represent a monovalent metal, the chemical change is thus expressed:



If the working conditions are such that an insoluble ferrocyanide is formed, the silver of the original image will be finally converted into one of ferrocyanide. Most ferrocyanides being highly coloured bodies, and the colourless salts of this acid being readily converted into coloured substances, it is evident that this process places at our disposal a large number of colours.

The various metallic ferricyanides requisite for producing these colours are not commercial substances, and some of them, moreover, are extremely unstable bodies, so that it is necessary to make use of solutions which will generate the ferricyanide required at the moment we require it. This is done by mixing in certain proportions a solution of any alkaline ferricyanide (that of potassium is generally used) with a solution of the salt of the given metal, which must obviously be a salt which has, of itself, no action on the silver image. Ferric chloride and cupric chloride are, for this reason, to be avoided.

In instances where the metal forms several ferrocyanides of different colours (uranium is a case in point), every variation in the proportion of the two salts favours the formation of one or other of these ferrocyanides, and therefore produces a different colour of the image. It is an invariable rule, however, to avoid excess of alkaline ferricyanide in the toning bath, for the reason that excess of this salt favours the formation of ferrocyanide of potassium, a soluble salt which diffuses through the liquid precipitating some of the salt of the other metal. Hence a certain proportion of the coloured ferrocyanide is lost to the image, and goes to cause trouble in the bath. The conversion of the mixture of potassium ferricyanide and of the salt of the second metal into ferricyanide of this latter metal is never absolutely complete, however small the proportion of ferricyanide in the solution; there is always a certain proportion of uncombined alkaline ferricyanide, the prejudicial effect of which is magnified when the image under treatment is subjected to continual motion, because, under these conditions, the soluble salt which is produced will have a chance to diffuse into the liquid before being converted into insoluble form at the place at which it has been formed.

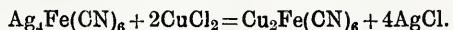
It is important to note, too, that the presence of any ferrocyanides in the solutions before use must be guarded against, as must also its formation by causes other than those already mentioned. As pure a solution as possible of potassium ferricyanide forms the basis of the several processes, and, as the various baths are more or less sensitive to photochemical decomposition, it behoves the operator to work in a fairly weak light. Care must also be taken to remove all substances other than metallic silver which can reduce ferricyanide. The treatment of the image in a solution of an oxidising agent is a plan to be commended, as a preliminary to toning, for the sake of obtaining pure tones and high lights.

It must be noted as well that most coloured ferrocyanides are extremely readily affected by the most dilute alkaline solutions, even of alkaline carbonates. Ordinary tap waters contain notable quantities of carbonate of lime, the action of which upon the insoluble ferrocyanide must be prevented. This means that washing must be done in acidulated water.

The tones obtained are the same so long as the proportions of the reacting salts are kept constant, whether the solution be used strong or weak. Weak solutions, it need hardly be said, offer the very practical advantage of controllability of action.

In the majority of cases the white and opaque ferrocyanide of silver which is formed only chokes up the image. In all cases where the process is used for toning (and not for intensification) purposes, it is advantageous to remove this ferrocyanide of silver by the action of some solvent which has no effect on the coloured deposit; sulphocyanide or thiosulphate is suitable for this purpose, according to circumstances. If, however, it is left in, there is the advantage that, if the colour is not suitable, the original image can be resuscitated by a series of very simple operations. The introduction into the toning bath of solvents of silver salts will be thus avoided in the case where such introduction is possible.

Instead of removing this ferrocyanide of silver, it can be utilised as the basis of fresh coloured products identical with, or different from, those already obtained. Thus, silver ferrocyanide in the presence of ferric or cupric chloride is at once converted into ferric or cupric ferrocyanide:



This change can then be followed by an intensification or modification of the colour produced by the first toning. The toning can be effected simply by immersion in two successive baths, the first converting the silver into ferrocyanide, and consisting of an alkaline ferricyanide; the second converting this ferrocyanide into a coloured ferrocyanide. This transformation is possible only so far as the reaction, analogous to that foreseen by the previous equation is exothermic (*i.e.*, produces heat when it takes place). This will be the case whenever the chloride of the metal, the ferrocyanide of which is required, can be used. Toning in a single solution is, however, to be preferred to the use of two solutions, for the sake of the control it gives over the progress of the reaction, and the more vigorous image given when it is used.

Preparatory Measures applicable to all the Toning Processes.—These toning processes are applicable to any image obtained by development on a surface coated with sensitive silver salts, and some of them (uranium, molybdenum) actually intensify the prints; others (copper, iron) reduce them. The development of the print should therefore be stopped so as to produce an image of suitable density. The greatest care is necessary in fixing and washing. After thorough treatment in water, which is changed at frequent intervals, the prints should be placed for a few minutes in an oxidising bath, composed of a one per cent. solution of nitric acid or of persulphate of ammonia, followed by a further short washing.

The first solution to be prepared is that of ferricyanide of potassium (red prussiate). This solution is readily decomposable in the air, especially when exposed to light, and should therefore not be kept any longer than is necessary. The crystals should be washed with a little water prior to being weighed out.

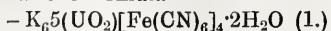
A.

Potassium ferricyanide.....	4½ grains or 10 grammes.
Glacial acetic acid.....	44 " " 100
Water	1 ounce " 1000 c. c.

This solution will be mixed, according to the directions below, with various other solutions. In all cases the dish in which toning is conducted should be kept still; the toning should be done in a feeble light, preferably by lamp light, and in the intervals between examining the print the dish should be covered with a card. The image, having reached the desired tone, is rinsed several times in acidulated water (acetic or nitric acid may be used for this), and is then washed for a few minutes (not more than four or five) in ordinary water. This brief washing in ordinary water will not, with most kinds of tap water, in any way reduce the image.

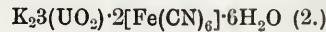
If the foregoing precautions be taken, toning will take place with great regularity, and gives great range of tones according as the process be arrested at an early or late stage in the operation. The prints show only the slightest tinge of colour in the highest lights, so slight, indeed, as to be quite unobjectionable in paper prints. This can, however, be completely removed by very short immersion of the print in a very weak solution of carbonate of soda, the action of which can be stopped by transference of the print to a weak acid bath, and afterwards to water. The permanence of the prints produced in this way is perfect. I have kept them for ten years in the windows of a chemical laboratory under the most unfavourable conditions, including damp, light, sulphuretted hydrogen, and acid vapours. Prints toned with uranium and iron have withstood these prejudicial agents, and have not shown the least sign of alteration.

Uranium Toning.—The theory of the process is briefly as follows: Two double ferrocyanides of uranium and potassium are known. The one, of a fiery red colour, has the formula—



It is somewhat soluble in pure water, but insoluble in water made acid with certain acids, notably acetic acid. It is formed when a few drops of a uranic salt are added to a strong solution of alkaline ferrocyanide. Under these circumstances, the most usual result is a limpid liquid of a bright red colour, which, when neutral, deposits the ferrocyanide formed, only very slowly. It is possible, however, that in such a medium as a gelatine film, which obstructs the movements of solutions to a great extent, this reaction would come within the range of practical use.

The other ferrocyanide is of a reddish-brown colour, and has the formula—



It is completely soluble in water, and is formed when a few drops of a dilute solution of ferrocyanide of potassium is added to a strong solution of uranic salt kept in excess. The precipitate quickly coagulates into an amorphous, almost opaque, mass. We thus see that the excess of uranic salt in the toning bath favours the production of brown tones, whilst the excess of ferrocyanide enables red tones to be obtained, but at the risk of diffusion upsetting one's calculations.

The commercial salts of uranium are the acetate and the nitrate. Although the latter can be used, it seems more reasonable to use the acetate, seeing that the solution is acidified with acetic acid. The equation already given and the formula just cited show that, for the formation of the brown ferrocyanide (2), the proportion of the two salts must be 8 molecules of potassium ferrocyanide ($\text{K}_6\text{Cl}_2(\text{CN})_{12}$) to 18 molecules of uranic acetate ($\text{UO}_2 \cdot (\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$), *i.e.*, 5264 parts of the first to 7668 parts of the second.

The red ferrocyanide is formed, on the other hand, by mixing 8 molecules of ferrocyanide and 15 molecules of uranic salt, *i.e.*, 5264 parts of the first with 6390 parts of the second. It is advisable to exaggerate these proportions in actual practice, increasing the proportion of uranic salt if the brown ferrocyanide is desired, and the relative weight of ferrocyanide if the red ferrocyanide is wished for. After toning, the gelatine has become insoluble in water at a temperature of 60° C.

In practice I use the following solution (cold):—

B.

Uranic acetate	4½ grains or 10 grammes.
Glacial acetic acid	44 " " 100 "
Water	1 ounce " 1000 c. c.

The solution of the acetate is so slow that it is necessary to prepare the solution some time before. The solution, however, keeps indefinitely. The toning bath is made by mixing A and B at the time of using as follows:—

Tone	Sol. A.	Sol. B.
Sepia brown	50 c. c.	100 c. c.
Reddish-brown	50 "	70 "
Fiery red	50 "	55 "

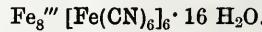
[The English reader may substitute minimis or drachms for c. c. in the above formulæ.—TRANSLATOR.]

If the tone is too intense, it can be reduced by a longer washing in ordinary water (unacidulated); but a better plan is to immerse it after several rinses in a ten per cent. solution of sulphocyanide of ammonium, which will give great transparency to the image and will leave a better gradation. The same volume of solution can be used to tone several prints successively; but, as the liquid soon becomes turbid, it cannot be kept for use on another occasion.

Iron toning.—The theory of this process is somewhat as follows:—

If a few drops of a solution of a ferric salt be added to a solution of potassium a blue liquid is produced, but no precipitate, *i.e.*, a soluble blue is formed which treatment with an alkali shows to be a double ferricyanide of potassium and iron (ferrous) and not a ferric ferrocyanide.

The only insoluble ferrocyanide which can be used in toning with iron salts is Prussian blue:—

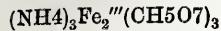


This is obtained by adding a few drops of ferrocyanide of potassium solution to a solution of a ferric salt. This substance, which is absolutely insoluble in water, in cold solutions of acids, is instantly decomposed by ammonia, and by caustic alkalies, having a residue of reddish ferric hydrate, $\text{Fe}_8(\text{OH})_6$.

Only one coloured product entering thus into the case, the tone obtained varies only very slightly with a very considerable variation in the proportion between the two constituents of the bath. The point to be avoided is a too large quantity of ferricyanide, which favours the formation of soluble blue. If, on the other hand, we wish to obtain a clear blue colour, we should keep down the proportion of ferric salt, an excess of which tends to greenish tints, though less so if the immersion of the print is not prolonged.

The choice of the ferric salt is an important point; those combined with a mineral acid act directly on the silver image, *e.g.*, ferric chloride, sulphate, and nitrate. Although I have successfully used ferric sulphate, the results with these salts are most capricious. The ferric salts of

organic acids are much more suitable, and from them we select ferric ammonium citrate on account of its good keeping properties. It has the formula—



The exact proportions corresponding to the formation of Prussian blue, without excess of either reagent, are one molecule of ferricyanide of potassium and one molecule of ferric citrate, or 658 of the first to 716 of the second. The presence of an acid in the solution is an advantage on the score of opposing the formation of insoluble basic salts.

In the practical use of the process I make the following solution in the cold:—

C.

Ferric ammonium citrate	... 4½ grains or	10 grammes.
Glacial acetic acid	..... 44 "	100 "
Water	..... 1 ounce	or 1000 c.c.

This solution should be kept away from the light, preferably in bottles of non-actinic glass. It should be thrown away if it is found that, when mixed with A, a blue precipitate appears. The toning solution consists of:—

Tone.	Sol. A.	Sol. B.
Blue	50 c.c.	75 c.c.

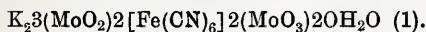
This mixture is made and used in as feeble a light as possible; it is, in fact, the ordinary sensitising solution for ferro-prussiate papers. The image turns at first a bluish-green, passing afterwards slowly to a clear blue. Washing may, in this case, take place in ordinary tap water. The image can be cleared by placing the print for a few minutes in a bath of sodium thiosulphate, afterwards washing well in water. If only a slight blue fog is to be cleared off, immersion for a few seconds in an extremely weak solution of ammonia (about one per cent.) will answer. This brightens the blue, which takes on a violet tint; but in a very short time, especially if the ammonia solution is not sufficiently diluted, the image entirely disappears. This treatment must therefore be used with caution.

Uranium-iron Toning.—For the production of green tones, the use of uranium and iron salts in conjunction has been frequently recommended. A print toned by uranium to a red colour is immersed in a solution of a ferric salt, which, attacking the ferrocyanide of silver, produces a certain quantity of Prussian blue, the mixture of which in the film with the red uranium ferrocyanide gives rise to a green. This method is, however, very fitful. It often happens that, in consequence of the impermeability of the gelatine in the toned parts, the ferric salt only gains access to the silver ferrocyanide in the clear parts, producing therefore a very curious two-colour effect. It is very much better to form the two ferrocyanides at one and the same time. Thus:—

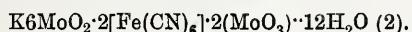
Tone.	Sol. A.	Sol. B.	Sol. C.
Green	50 c.c.	50 c.c.	50 c.c.

The practical precautions have been mentioned above when describing the production of red and blue tones. I may repeat that the solution must be kept at rest, and the operation performed in a feeble light. Washing takes place in acidulated water.

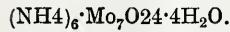
Molybdenum Toning.—The addition of a few drops of a solution of ferrocyanide of potassium to that of a salt of molybdenum gives a brown precipitate of the formula (according to Wyronoff):—



With excess of alkaline ferrocyanide a brown, limpid liquid is produced, which deposits, after some time, a different double ferrocyanide of brownish-red colour, but which, judging from its solubility, scarcely lends itself to the production of coloured images. It has the formula:—



We will select, as a source of our molybdenum, the commercial ammonium molybdate—



In this case the reaction can take place regularly only in the presence of a fair proportion of acid which will combine with the ammonia coming from the molybdate, and with the potassium from the ferricyanide.

It is easy to see that the necessary proportions of the several salts are 15 molecules of molybdate to 28 molecules of ferricyanide, with at least 216 molecules of acetic acid; this means 18,540, 18,424, and 12,960 parts by weight respectively of these substances. Much excess of potassium ferricyanide in the bath would bring about the loss of the image by diffusion. Without, however, going so far as this, the tone can be pushed towards the red, owing to the partial formation of red ferrocyanide of molybdenum. In practice we just prepare the following solution:—

D.

Ammonium molybdate	... 6½ grains	... 10 grammes.
Glacial acetic acid	..... 44 "	... 100 "
Water	..... 1 ounce	... 1000 c.c.

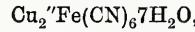
The molybdate dissolves only very slowly. It should be finely powdered,

and the mixture heated at intervals until the dissolution of the salt is complete. To make the toning bath:—

Tone.	Sol. A.	Sol. D.
Sepia brown	..... 50 c.c.	60 c.c.
Reddish-brown	..... 50 , , ,	50 , , ,

After toning and washing, the print may, if it is thought desirable, be placed in a solution of thiosulphate in order to give it greater transparency. The prints obtained in this way are of an agreeable tone, and less sensitive to the action of tap water than those toned by uranium. Pure whites are easily obtained, and the process is very inexpensive. The bath can also be mixed with the bath for toning with iron (C), but the results obtained exhibit no special features.

Copper Toning.—When ferricyanide of potassium is added to an aqueous solution of a copper salt, a precipitate of cupric ferricyanide falls down. A solvent for this precipitate must therefore be found before a toning bath can be made. Ammonia, sometimes suggested, is of no use, because it dissolves also the cupric ferrocyanide formed in the reaction. I used last year with great success an acid solution of potassium oxalate. Quite recently W. B. Ferguson has recommended the use of a neutral solution of potassium citrate. Cupric ferricyanide,



is formed as a gelatinous purplish-red powder when one mixes sufficiently concentrated solutions of any copper salt and ferrocyanide of potassium. The best salts of copper are the acetate or the sulphate, which is a very common commercial product, and is easily prepared in solution. The necessary proportions are one molecule of ferricyanide to three molecules of copper salt, a slight excess of copper salt being used to slow down the action of the ferricyanide on the silver. This means 658 parts of ferricyanide to at least 747 of copper sulphate, a proportion (6:7) almost exactly the same as that advised by Mr. Ferguson. In practice, therefore, the following three solutions are prepared:—

No. 1. Ten per cent. solution of neutral potassium citrate.	No. 2. " cupric sulphate (cryst.)
No. 3. " " potassium ferricyanide.	

Mix in the order given just before use.

Tone.	No. 1.	No. 2.	No. 3.
Purple	100 c.c.	7 c.c.	6 c.c.

No attempt should be made to clear the image after toning. To do so would mean the probable removal of the image itself. By adding a certain quantity of ferric ammonium citrate to the above solution beautiful violet tones are obtained.

Restoring the Original Image.—It is always easy to bring back the image to its original condition (whatever may have been the treatment of it) so long as the salts of silver formed in the course of the various reactions have not been removed. All that is necessary is to first remove the coloured ferrocyanide, and then reduce the residual silver salt to the metallic state. For the first operation a very weak solution of an alkaline carbonate answers for uranium, and a similarly dilute bath of caustic alkali for iron-toned prints. The ferrocyanide of silver thus left is converted into chloride by means of a weak solution of hydrochloric acid, washed, exposed to light, and developed with any developer. The density is exactly that of the original print.

L. P. CLERC.

WEST'S PRINTING PROCESS.

[Patent No. 2373 of 1900.]

DR. WEST applies a compound which, when the print is immersed in a bath of water or other suitable material, will be dissolved, and with the bath form a solution for toning or fixing the print. With a paper sensitised in accordance with his patent elsewhere specified, which includes ammonium nitro-ferricyanide and ammonium ferric citrate, the coating on the back of the paper will consist of a concentrated aqueous solution of a salt of copper, which is allowed to dry.

For this purpose I prefer the double citrate of copper and magnesium, but other cupric salts will give more or less satisfactory results when used in this manner. The purpose for which this coating of a copper salt is applied to the back of paper sensitised in accordance with my patent above specified is that, after such sensitised paper has been exposed to light, as in printing under a negative, and the same placed in a little water, the copper salt is dissolved off from the back of the paper, as well as are the salts from the sensitised side of the paper, and the two combined form a mordant or fixing solution, which effectually prevents the prints from becoming blue, as would be the case were such prints not subjected to a proper fixing agent. In my patent elsewhere referred to, and in the use of the common sensitised paper, it is necessary to place the fixing or toning chemicals in the bath preparatory to immersing the print; but, with sensitised paper having the fixing or toning solution applied to the back, the necessity of preparing a toning or fixing bath is avoided, the copper salt on the back of the paper being dissolved in the first washing water, which is added in small quantities, and not changed for a sufficient length of time, say, about ten minutes,

to enable the copper to act freely upon the print. After this bath nothing is required except a brief washing in clear water, as is usually done with prints fixed or toned in a separate bath. As before stated, different colour effects may be produced by changing the fixing or toning compound."

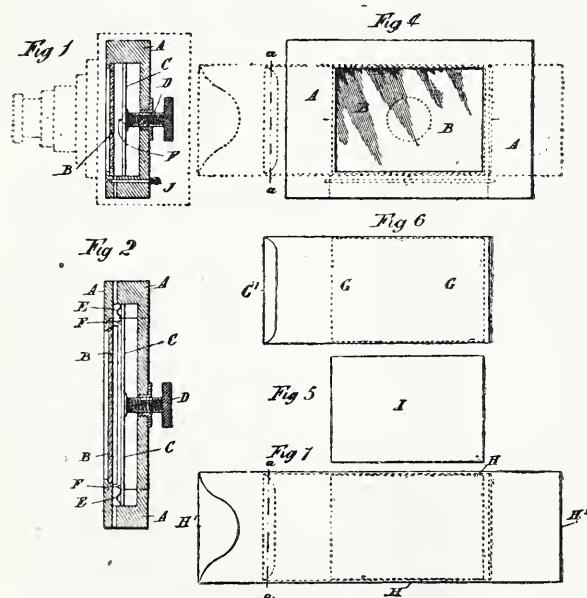
WRIGHT'S FILM AND PLATE-CHANGING APPLIANCES.

[Patent No. 4621 of 1899.]

THIS is a camera box with a movable internal leaf adjustable and affixable by a screw or other appliance from the back, the plate being so arranged that it can be drawn sufficiently backwards to allow of a film or sensitised plate with its holder to be inserted through a slit, and by a forward movement of the leaf be pressed closely towards a glass or opening in the face of the box. The inner leaf has a cutter or blade at each of the two ends which pierce, and by which a film or plate can be retained in position, and the holder after insertion can be severed ready for withdrawal through end slits of the box, the ends of the holder projecting for that purpose. There is also a slit at the bottom of the box to allow of the film or plate to fall into a bag beneath, the screw or nipping appliance being moved sufficiently for the film or plate to be released, and then for a slider to be drawn backward to allow the film or plate to drop. The holders are in the form of envelopes, and preferably two of these are provided for each film or plate, one envelope being enclosed within the other, and the film or plate so arranged as to be centralised in the box that the one end of each envelope projects ready to be drawn out and thereby leave the film or plate exposed for the image.

The inner leaf has rubber or felt pads which close up the slits.

The operation is as follows: The films in a flat condition with the envelopes are slipped into the box, the leaf is moved towards the glass, and in so doing the envelopes become pierced by the blades, the closed



ends of both envelopes on one side of the box are cut or torn off, the envelopes are withdrawn separately from opposite ends, the film is pressed to the glass, the image is then taken, the inner leaf is moved away from the glass, and the slider is withdrawn, the film or plate falling into the bag, and, on a complete backward movement of the slider, the box is ready for a fresh envelope, and film or plate for a repeat.

The following is the description:—

A, box or case, with glass, B, fixed in front opening; C, back-closer, operable by screw, D, from the back; E, E, pliable fillets for back-closer to press against the internal portion of box, A, to prevent entrance of light to the film or sensitised plate; F, F, knife or lancet blades, so fixed in box, A, that the points retain the plate or film in position, and also serve as piercers to pass through the two envelopes, G, H, when the back plate, C, is forced home by the screw, D.

The cutting edges of the knife or lancet blades look in both directions, and can sever either envelope, according to whether they are inserted from the right or from the left-hand side of the box, A.

It is preferable to insert the envelopes, with the film or sensitised plate within them, from the right-hand side, and with a portion of each end of the larger envelope exposed, one exposed end, say II¹, of which has to be cut or torn off, and with it is also cut one end of the inner envelope, say at the line a, a, leaving the opposite end, II², exposed, to be drawn out from the side of the box, A, said envelope being severed, preferably centrally, along its length for its free exit when drawn out.

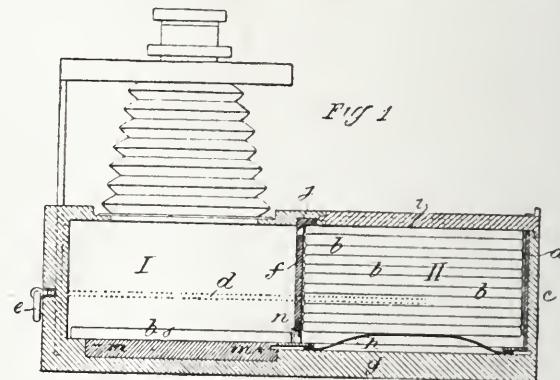
The cut end, g¹, of the inner envelope, G, is now left exposed, and, as it is gripped and severed centrally lengthwise and drawn out, the film or

sensitised plate, I, is left within the box, A, and close to the glass front, on the further movement of the leaf, C, will be pressed to glass, B, for the picture or image to be taken in the ordinary way by the camera lens, all light being excluded in the manner already described.

DE GEOFRY'S MAGAZINE FOR HAND CAMERAS.

[Patent No. 6705 of 1899.]

THIS magazine consists of a drawer, a, in which are placed, in the ordinary way, metal frames, b b b, in which are held the sensitive plates. It can be moved into a space formed at the back of the dark chamber by a box, c, which is fixed or removable (in the latter case, it is provided with a screen or shutter). This box is of such dimensions that, besides the necessary space in I, in the optical axis of the objective, for lodging the plate to be exposed, there is sufficient space in II to receive the drawer, a. This drawer may be moved so as to be drawn either into the



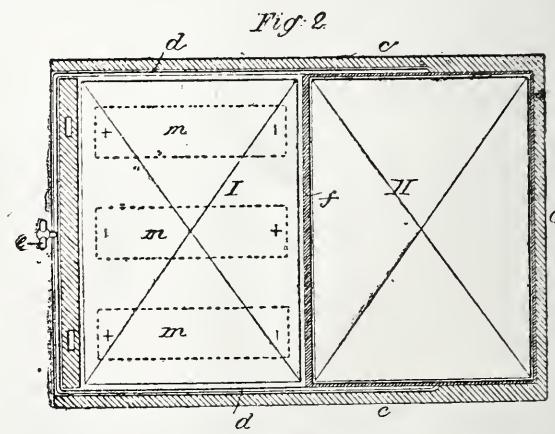
position, I, or the position, II. One or two rods, d d, which are fixed to the drawer, and which terminate in the ring, e, on the exterior of the box, c, permit of this operation being performed.

The side, f, of this drawer, which also forms one of the walls of the dark chamber proper, is of a height equal to the total thickness of all the plate frames, less, at each end, the portion necessary to allow the passages of the end or top and bottom plates.

Upon the bottom, g, of the box, e, are fixed in the part, II, of the magazine, one or more flat springs, h h, which press the piles of plates against the opposite wall, i.

These springs are placed according to the line of displacement of the drawer, so as not to prevent the movement of it.

At the upper part, i, of the box, b, are arranged one or more small



pieces, j, in the form of inclined planes, which project only sufficiently to seize one frame, b, and so placed as to permit of the frames coming along with the drawer, from the position, II, into the position, I (by reason of the flexion of the springs), but so as to hold the top frame by catching its edge when the drawer returns to the position, II.

The apparatus will then be in the position shown in fig 1, that is to say, the top frame, b, being held back by the stop, j, falls, when the drawer is pushed right back, and has come to the position, II, and the fallen frame takes up then the position, b, s, and is held there by the force of one or more permanent magnets, m, let into the floor, g, at the bottom of the chamber, I, and flush with the inside surface, the frames which hold the sensitive plates being made of suitable metal. When the frame has fallen to the bottom of the chamber, I, it is held there stationary by the magnet or magnets.

Our Editorial Table.

A SECOND edition of Mills' *Photographer's Exposure Note Book* has been issued by Messrs. Dawbarn & Ward, Limited, of 6, Farringdon-avenue, E.C. In assisting the photographer to arrive at correct exposures, and in supplying him with means for making records of them, this little book, which is published at 1s., should be found of very great use.

ROANOID.

MESSRS. LONSDALE BROTHERS, of Green-lanes, Harringay, N., write: "Noticing an inquiry for a material suitable for covering hand cameras, &c., we beg to send for your inspection a sample of our Roanoid, which we are selling for this purpose. It is thirty-five inches wide, price 4s. per yard, any length. You will see that it is almost indistinguishable from real hide. It will not scratch or rub up on the surface like leather, and is in consequence more durable, besides being waterproof." Judging by the sample sent, Roanoid appears to be an excellent substance for covering hand cameras.

INSTRUCTION IN PHOTOGRAPHY. TENTH EDITION.

By Sir W. de W. ABNEY, K.C.B., D.C.L., F.R.S.

London: Sampson Low, Marston, & Co., St. Dunstan's House, Fetter-lane, E.C.

We have in our possession the first public edition of Sir William Abney's book, an admitted classic in photographic literature. It was issued when the author was instructor in photography at the School of Military Engineering, Chatham, and it consists of 168 pages. The date on the titlepage is 1874, and the information it contains is entirely pre-gelatine in character. Since then each succeeding edition has grown with the growth of our knowledge of photography, but the book has never departed from its reputation of being a well-considered guide in practical photographic work, based upon that authoritative mastery of theory with which Sir William Abney's name is rightly associated.

The tenth edition of *Instruction in Photography* numbers some 500 odd pages, and the newest matter principally relates to half-tone work in monochrome and colour. Some of the subjects dealt with in the course of the volume are the action of the spectrum, the theory of development, phenomena in development, the dark room and its fittings, lenses and shutters, preparation of plates, gelatino-bromide paper and films, defects in gelatine negatives, wet-plate photography, collodion dry-plate processes, production of transparencies and enlargements, artificial lighting, theory of silver printing, preparation of sensitive papers, the platinum-type printing process, mounting prints, the carbon process, photo-lithography and zincography, photo-reliefs and photo-engraving, &c.

Abney's *Instruction in Photography* is a work which has always appealed to those photographers who are not content with a mere superficial smattering of the subject, and of the new edition it is right to say what has often been said before of this valuable book, viz., that it should always be at hand for reference. The tide of publication of late years has been heavily laden with photographic books, but Abney's *Instruction* is in no danger of being swamped. Unquestionably it remains the ablest and most useful photographic text-book in our language.

Studio Gossip.

A NEW YORK correspondent states that, while photographers were at work in the Orange Mountains, New Jersey, recently, taking a series of pictures which were to be reproduced on a kinetoscope as representing the battle of Spion Kop, one of the cannons was fired prematurely. Two of the most prominent actors in the sham fight were seriously injured. The incident will, doubtless, add unexpected realism to the scenes. Many pictures have been "faked" in this way, purporting to be reproductions of battles in Cuba, the Philippines, and South Africa.

THE Röntgen rays have been called in to throw their light on a point of law. During the hearing in the Chancery Division of an action by the Dunlop Pneumatic Tyre Company to restrain an alleged infringement of a patent, an expert stated he had examined a tire by the Röntgen rays in order to determine its position under air pressure. It was then suggested that Mr. Justice Buckley should have the advantage of a personal examination. Assent being given, the whole Röntgen apparatus was set to work on the Bench beside the Judge, who was able, by the aid of a screen, to see how the otherwise invisible wires concealed in the rubber tire lay against the rim. The demonstration occasioned much interest in court.

THE new material for paper-making, about which a good deal has been said of late, turns out to be the guaxima, which grows wild in great abundance in Brazil, particularly on low lands near the sea. Brazilians believe that this fibre would prove an excellent substitute for jute, which is all imported, and that it would prove the basis of an important industry. The threads are long

and very strong, and will resist the action of water, the fibre being used by fishermen for their nets, which last for years if soaked in a tincture of aroeira bark. The process of elaboration of the guaxima fibre does not require long maceration in vessels, as is the case with jute, immersion for a few days in running water being sufficient to loosen the green outer bark with the hands, after which the rods are exposed to the sun in order to dry the woody part; this then contracts and allows the fibres to be easily separated.

THE PARIS EXPOSITION.—The Paris correspondent of a contemporary says that outside Paris a few days ago over 2000 trucks filled with exhibits were lying exposed to wind and rain, and by the order of the Government not one was allowed to enter the grounds before the 18th inst. It is probable that, now that the official opening is over, the Exhibition will be closed for a few weeks in order to give the workmen breathing room. If the public is admitted indiscriminately, the show will never be finished. The question of illumination is hopeless. Up till last Friday night the cables had not been tested, and in some instances the connexion had not been established. If there is at night anything like the crowd at the opening of the 1889 show, which trampled under foot the glow-worm lamps in the gardens, the installation will have to be practically recommenced. One of the most amusing bungles is the question of statuary. The welcoming figure over the main entrance is *La Parisienne*. It is a modern creation, and infinitely more suggestive than the usual goddess of labour using her wings as umbrellas for a savage-looking workman with a pick axe, and a woman with a child at her breast, apparently keeping off flies with an olive branch. After it had been put up, the authorities noticed that the *Parisienne* was dressed in furs, and came to the conclusion that this was out of place for a purely summer show. Whether she has to be smashed up and removed is still an open question. As to the statues in general, they are asleep in their boxes, and for the very good reason that the pedestals have not yet been built; and a study of Venus in the simple costume of a pure mind, leaning against a tree, and Adam and Eve basking on a tulip patch, might reasonably be considered as inartistic.

News and Notes.

PHOTOGRAPHIC CLUB.—April 25, at eight o'clock, Lantern Evening. Slides by Mr. E. A. Newell.

VISCOUNT MAITLAND, who is the adjutant of the 20th (Rough Riders) Battalion of the Imperial Yeomanry, left for the front on Saturday last.

THE Southport Photographic Society's Exhibition of members' work will be open from May 28 to May 31 inclusive. The Society's silver and bronze medals will be placed at the disposal of the Judges, to be given, if the work merits it, for the artistic and technical excellence of photographs.

EXHIBITION OF MODERN ILLUSTRATION.—The Science and Art Department have consented, at the request of the Council of the Society of Arts, to organize an Exhibition of Modern Illustrations, consisting of specimens of typographic work suitable for books, magazines, and newspaper illustrations.

WOODFORD PHOTOGRAPHIC SOCIETY.—Mr. E. J. Wall will give a technical lecture on Colour Photography before the members of the Woodford Photographic Society on Wednesday, the 25th inst. If any gentleman interested in the subject, or any members of neighbouring photographic societies, would like to attend, the Hon. Secretary, Mr. F. G. Emley, of the Florence Villas, Chelmsford-road, Woodford, would be glad to supply the necessary permission.

THE next meeting of the Physical Society will be held on April 27, at eight p.m., at the Solar Physics Observatory, South Kensington, when Sir Norman Lockyer, K.C.B., will give a short account of the physical problems now being investigated at the Observatory, and their astronomical applications. If the night is fine, the thirty-six inch reflector, and ten-inch and nine-inch reflectors, will be used for the observation or photography of celestial objects and their spectra. The large Apps-Spottiswoode coil and Rowland grating will also be shown in operation.

CARBIDE OF CALCIUM PROSECUTION.—At the Thames Police Court on Thursday, April 12, the Argo Steam Shipping Company, of 4, Cullum-street, E.C., were summoned for an offence against the Petroleum Acts. Mr. Bunting, who prosecuted on behalf of the Thames Conservancy, said the steamship *Reiter* brought a case of carbide of calcium up the Thames, above Thames Haven. Such a thing was prohibited, unless it was in a special vessel. The case in question was brought to the docks, and, after the defendant's attention had been called to the fault committed on the other side, they had the case reloaded and sent back to Bremen. Carbide of calcium was a dangerous substance, as, when brought into contact with damp, it gave off an explosive gas. Eventually the magistrate imposed a fine of 40s. and 2*l*. 2*s*. costs.

KINDNESS REWARDED.—Max Martin Ross, a native of Swindon, aged forty-five, was charged at the Birmingham Police Court with stealing a camera, two lenses, and three dark slides, value 5*l*., the property of Joseph Medlam, of 125, Livery-street, Birmingham. It appeared from the prosecutor's evidence that he took the prisoner into his house about Christmas time out of compassion, having known him twenty years previously. As he represented that he understood photography, witness gave him the use of a dark room, and a room as a studio. After staying with him for some time, the prisoner suddenly disappeared with the goods in question, which he pawned for 25*s*. The prisoner, who pleaded guilty, was sentenced to three months' imprisonment, the Chairman saying that he had shown a very peculiar kind of gratitude to a man who had been so kind to him.

Commercial Intelligence.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. T. E. Colney Wilson, 16, Swiss-road, Fairfield, Liverpool, for his negative, *Evening Calm*.

MESSRS. TENNANT & WARD, of 289, Fourth-avenue, New York, inform us that the demand for copies of the *Photo-Miniature* has necessitated the reprinting of No. 3, dealing with "Hand-camera Work;" and No. 4, dealing with "Photography Outdoors."

THE PRACTICE OF PHOTOGRAPHY is reported to be making headway among amateurs in the Bilbao district of Spain. Photographic goods were at first supplied by French houses, who were subsequently largely supplanted by the exertions of German agents, who offered cheaper articles. British houses are stated to confine themselves to sending catalogues of their goods; there also appears to be an impression abroad that British photographic materials would be more expensive than German, and that cameras and plates would be made to measure different from those in current use.

THE WARWICK COMPETITIONS.—The following is the list of awards of the Warwick Competition for the current month:—10*l.* prize, Alfred Bainbridge, 342, Leeds-road, Nelson, *Quiet Moments*; 5*l.* prize, W. B. Green, Grasmere, Gladstone-road, Watford, *All on a Gallows Tree*; 1*l.* prizes, R. H. Beavan, 74, Petteril-street, Carlisle, *A Portrait*; J. Brooks, 35, Liverpool-street, Brighton, *The Foot Bridge*; Albert Durn, The Studio, Wootton-under-Edge, *The First Copy-book*; Nichol Elliot, The Studio, Coldstream, N.B., *A Portrait of Lady*; G. H. Gill, 133, Trinity-road, Upper Tooting, S.W., *Our Cook*; C. R. Girardot, 11, Westland-road, Watford, *The Little Mill*; P. Goodchild, 2, Colonnade, Leamington, *The Gleaner*; W. G. Gould, 47, Kenwyn-road, Clapham, S.W., *My Father*; Lillie Green, Hunton Bridge Farm, King's Langley, *Threshing Wheat*; A. G. Lawson, 32, Ashley-road, Crouch Hill, N., *March Many Weathers*; W. H. Machin, 82, Bedford-street, Moss Side, Manchester, *Violin-maker's Workshop*; J. Peat Millar, Braehead, Beith, N.B., *Portrait of Little Boy*; V. T. Paul, Photographer, 1r. Morrab-road, Penzance, *Lilies*; E. W. Philpott, 96, York-road, New Cut, Bristol, *After Rain*; J. R. Reynolds, 15, St. Mary's-road, Sheffield, *Winter Weather*; S. von Schubert, Downside College, Bath, *In a quiet Somerset Wood*; J. W. Smith, 4, Britannia Buildings, Chesterfield, *An Electrical Dynamo*; W. T. Stokes, Ivydean, Grove Avenue, Moseley, *Berry Hall*; C. E. Thompson, Fordingbridge, *A Portrait of Dog*; J. Watson, 3, Grey-road, Walton, Liverpool, *A Letter from the Front*.

IN the Peterborough County Court last week Samuel Finney claimed 10*l.* 16*s.* 3*d.* from the Eastmid Company, Limited, for wages due and expenses incurred on behalf of the defendants. The Company entered a counter claim for 17*l.* 11*s.* 2*d.* for damages for leaving without notice, using the studio, &c. Mr. F. W. Atter was for the plaintiff, and Mr. J. Batten for the defendant Company. Finney stated that he was engaged by the Eastmid Company, Limited, which consisted of Mr. Parr (Secretary), Mr. Marriott, jun., and Mr. Marriott, sen. (Directors) on June 19. A letter was received on June 14 offering the position at the Peterborough studio at a salary of 30*s.* per week, with certain commission. The terms were accepted, and there was to be a month's notice on each side. All went well until November 20, when claimant agreed, on certain conditions with the Company, to accept a salary of 25*s.* a week in future. The claimant wrote a letter stating the conditions, but not one was complied with, and therefore he claimed the whole of the 30*s.* On June 5 he left without giving any definite notice. As to the counter claim, Finney admitted having used the studio for lodging for some time. There was no objection made to this, neither was there any intimation that a charge would be made upon him. He provided his own bedding, and used the gas when required. Asked why he left the Company's employ, Finney stated that he had not received any salary for several weeks, although he had applied to the Company for his wages on many occasions. After a lengthy hearing, evidence having been given by Mr. Parr, the Judge reduced the plaintiff's claim, and allowed several items on the counter claim, which gave plaintiff 5*l.* 7*s.* 8*d.*

THORNTON-PICKARD, LIMITED, v. THORNTON.—The Thornton-Pickard Manufacturing Company, of Altrincham, write us: "It is a source of satisfaction to us that the Judge's verdict was in our favour as to the constructive portion of the agreement, and that he stated that in his view Mr. Thornton had broken the agreement in commencing to make films. After having established so much, it is very disappointing that the verdict should go against us on such a technical point as the over-wideness of the clause relating to 'other photographic appliances.' In our opinion, the Judge gave this Company credit for claiming more than we have ever wished to claim. We have never held the opinion that the agreement would prevent Mr. Thornton from commencing business as a chemist, and selling nitrate of silver, bromide of potassium, gelatine, distilled water, or the numerous other chemicals and articles which, when brought into certain combinations with each other, form photographic appliances. For instance, we hold that he would be perfectly justified in making or selling the articles mentioned above as such, but when an emulsion is made of gelatine, nitrate of silver, bromide of potassium, &c., and it is coated on to some substratum such as glass or celluloid, then we arrive at a photographic appliance, which we hold that Mr. Thornton is debarred from dealing in either directly or indirectly. We have not as yet had time to consult our solicitors as to the advisability of appealing to a higher court, but we have little doubt that they will recommend us to do so. We add one or two extracts from the official shorthand report of Mr. Justice Kekewich's judgment. Speaking of a film, his Lordship says: 'I suppose it might be otherwise described, but it is a photographic appliance, and, being a photographic appliance, it comes within the words here, "other photographic appliances," and Mr. Thornton seems to me, according to the strict construction of this clause, to have clearly prohibited himself from directly or indirectly carrying on, or being engaged in, or concerned in, or interested in the business of a manu-

facturer of or dealer in films.' Again, speaking of the constructive part of the agreement, he remarks: 'So far I am entirely with the plaintiffs, and think there has been a distinct breach of the covenant. Then comes the more difficult question to my mind whether the covenant itself is void in law.' As you know, the Judge ultimately decided that the covenant, or at any rate the clause relating to photographic appliances, was void in law.

Patent News.

THE following applications for Patents were made between April 2 and April 7, 1900:—

SENSITISED PAPER.—No. 6074. "Improvements in Photographic Sensitised Paper and the like." J. E. THORNTON and C. F. S. ROTHWELL.

PROJECTION.—No. 6086. "Improvements in the Method of and Means for Taking and Projecting Photographs." T. THORP.

SHUTTERS.—No. 6088. "Automatic Timing Device for Photographic Shutters." J. E. THORNTON.

PANORAMIC CAMERAS.—No. 6235. "Improvements in Panoramic Cameras." Complete specification. M. T. STONE.

CAMERAS.—No. 6346. "Improvements in and connected with Cameras to enable Sketches or Tracings to be made." A. R. TINDALL.

KINEMATOGRAPHS.—No. 6351. "Improvements in and relating to Kinematographic Instruments." Communicated by L. Senfter and H. Terrot. W. G. HEYS.

SHUTTERS.—No. 6461. "Improvements in or relating to Photographic Shutters." Communicated by H. M. Reichenbach. A. J. BOULT.

RELIEF PHOTOGRAPHS.—No. 6531. "A Process for obtaining Objects in Relief by Means of Photography." J. ITIER and W. C. ELBOROUGH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
23.....	Bradford Photo. Society	Negative-making, by the Members.
23.....	Glasgow and West of Scotland	{ Paper on The Composition of a Picture. —Exhibition of Prize Slides.
24.....	Aintree	The Lowlands of Scotland. D. J. Neill.
24.....	Birmingham Photo. Society	{ Demonstrations : Development. E. Underwood, C. F. Jarvis, and G. Whitehouse.
24.....	Bootle	{ Demonstration : Wellington Films. Harry Wade.
24.....	Hackney	{ On Tramp with a Camera. H. W. Dunkley.
24.....	Isle of Thanet	Demonstration. Mr. Forwalk.
24.....	Leeds Photo. Society	The Lofoten Islands. Howard Priestman.
24.....	Royal Photographic Society	{ The Latest Developments of Metro-photography. Bridges Lee, M.A.
25.....	Photographic Club	Lantern Evening: Slides by E. A. Newell.
25.....	Woodford	Colour Photography. E. J. Wall.
26.....	Leigh	Enlarging. Mr. Foxhall.
26.....	London and Provincial	Open Night.
26.....	Oldham	{ Technical Control for Pictorial Results. Reader, C. A. Hempstock.
26.....	South Norwood	Demonstration of the Secco Films.
27.....	Croydon Microscopical	{ Practical Demonstration of the Various Methods of Reduction and Intensification. Mr. Baldock.
27.....	Whitby	Prize Slides.
28.....	Borough Polytechnic	{ Excursion : Edgware and Whitchurch. Leader, F. W. Bannister.
28.....	Brentford	{ Excursion : Abrook Common. Leader, Hilton Grundy.
28.....	Liverpool Amateur	{ Excursion : Rosset and District. Leader, W. A. Taylor.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 10,—Ordinary Meeting.—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

NEW MEMBERS AND FELLOWS.

Nine new members were elected, and five candidates for membership were nominated. The President announced that five members had been admitted as Fellows of the Society.

THE MUNICIPAL ENCOURAGEMENT OF PHOTOGRAPHY.

MR. THOMAS BEDDING read a paper with the above title, in which he called attention to what had already been done for photography by some of the English municipalities, and suggested another field of usefulness for the Society, besides those at present before it. To photographers, he said, there should be something more than indirectness of interest in the fact that in several of our large towns the art-loving instincts of the inhabitants had manifested themselves by the erection of galleries, which were used in many cases for the reception of permanent collections of paintings, sculpture, and so forth, by past and present masters, and in others for the holding of periodical exhibitions of such works. He submitted that the interest of photographers in the matter lay in the hope that the encouragement thus afforded to the older forms of graphic expression might in future comprehend the youngest of them, namely, photography; and the object of the paper was to show that many

local authorities had already taken sympathetic action upon the subject, and to suggest that the Royal Photographic Society should take advantage of its power and position to co-operate in movements of the kind whenever opportunities occur. The recognition of photography by some of the great municipalities as worthy of being brought as prominently to the notice of the public as paintings and other works of art must have a most important influence in what is generally termed "raising the status of photography," and was equivalent to an admission that, in its pictorial aspects, the work of the camera had earned the right to a distinct place amongst modern methods of graphic expression. Further, a well-arranged display of the best modern work in a provincial town would not only agreeably surprise the public who inspected it, but would also have an educational influence on professional men and others acutely concerned in lifting commercial photography off the plane of mediocrity on which most of it unfortunately stood. The paper proceeded to refer in detail to the winter courses of lectures on photography delivered from time to time at Liverpool and Manchester under the auspices of the Corporations, the inclusion of a photographic section in the spring exhibitions of paintings at the Walker Art Gallery at Liverpool, the exhibitions organized by the Leeds Photographic Society, with the assistance of the Corporation, and the municipal photographic exhibitions held at Bradford, Derby, and Huddersfield. The author of the paper thought that the evident willingness of the great municipalities to encourage photography might be stimulated to further efforts in the same praiseworthy direction if it were known that, in addition to the co-operation of the local societies, that of the Royal Photographic Society was also available. The loan of the Society's permanent collection, when requested, would be a step in the right direction, and the influence which the principal and most representative Society in the world could bring to bear on foreign as well as British exhibitors would, no doubt, materially add to the success and prestige of a purely local display. In the matter of facilities for studying photography in the laboratory and the Exhibition gallery, London was well provided for; but the paper concluded with the statement that, however great the municipal encouragement of photography might eventually become, it would be incomplete without the intervention of the most powerful municipality in the world, that of the City of London. The City had done a great deal for many forms of art and industry, and, if at some future time the Royal Photographic Society could be instrumental in persuading the historic Corporation to lend its powerful encouragement to photography, in the form of a comprehensive exhibition or otherwise, a useful step forward would have been taken.

Mr. C. R. ROWE mentioned the action which had been taken in the West of England and at Derby with regard to photographic matters, and suggested that Mr. Bedding's paper should be printed in pamphlet form and forwarded to the town clerks of some of the larger boroughs, in order that it might be brought under the notice of the Corporations.

Mr. J. A. SINCLAIR referred to the excellent work which had been done by the London County Council at the Bolt Court Technical School, which, he said, was frequented by large numbers of apprentices employed at newspaper offices and photo-mechanical works, and who took a very keen interest in the instruction that was given.

Mr. J. W. MARCHANT thought the present was an opportune time to bring the subject forward, so far as London was concerned, having regard to the fact that the new municipalities created by the recent London Government Act were to come into existence in November next.

COMING EVENTS

April 24, Technical Meeting, "The Latest Developments of Metro-photography," by Mr. J. Bridges Lee, M.A. On April 25, Mr. F. H. Evans will formally open the third of the series of House Exhibitions with some remarks upon the examples of his architectural and other works, which he has consented to exhibit in the Society's rooms.

Hackney Photographic Society.—April 10, Mr. A. Barker presiding.—A demonstration was given by Mr. D. C. NIGHTINGALE on the new developer kachin. It was claimed that this was equal to any other developer, and possessed, besides, advantages peculiar to itself. It was clean, very stable, easily controlled, and economical in use, it being possible to use the same solution repeatedly. It gave good warm tones in gaslight development papers, without addition of ammonium carbonate.

North Middlesex Photographic Society.—April 9.—Mr. J. H. GEAR gave a lecture on

NEGATIVE AND PICTURE-MAKING.

He dealt with exposure of the plate, and impressed the necessity of getting it correct to get good results. He gave a formula for a standard pyro-soda developer, and said that for slight under-exposure rodinal or para-amidophenol was good for reducing contrasts, while hydroquinone, if properly used, was good for over-exposure or increasing contrasts. Sodium nitrate was a very useful chemical in the dark room, and was more serviceable than potassium bromide for stopping development. Sharpness of definition, in his opinion, should always be obtained, any degree of softness desired could be obtained in after-manipulation. He then passed through the lantern slides from negatives without any after-treatment, and from the same when clouds and other additions had been made, pointing out the reason for doing so. He showed how the introduction of suitable figures improved and harmonised with an otherwise uninteresting landscape, and gave many other hints in picture-making.

Aintree Photographic Society.—An excellent paper was placed before this Society last week from the Royal Photographic Society, entitled,

PHOTOGRAPHIC DEFECTS AND THEIR REMEDIES,

by Mr. E. Dockree, illustrated by fifty lantern slides, the whole proving a good object lesson to beginners and veterans alike, such subjects as vibration, halation, fog, irregular development, injudicious use of apparatus, focussing, and distortion, with their cure, being fully demonstrated. Every Society would do well to procure this paper and slides for an evening, as it cannot help but be interesting to those who dabble in photography.

FORTHCOMING EXHIBITIONS.

1900.

- May 23-25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.
July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

MYSTERIOUS IMAGES.

To the Editors.

GENTLEMEN,—With reference to the phenomenon brought to the notice of the London and Provincial Association by Mr. Thomas, I would remind you that in the old days, when we had to do everything for ourselves, it was the practice to test the efficiency of the cleaning of our plates—especially when they had been used before—by breathing on them, when traces of imperfectly removed images showed on the surface; in this case it would seem probable that the plates had been imperfectly attended to, and that consequently vapour had settled unequally on the surface, and thus caused an unequal deposit of the fine dust always flying about; we all have experience of the way in which this deposit adheres to our windows, and in this case the result has been the production of the old image in a visible form.

My own practice was to leave plates for a whole night in a ten per cent. solution of nitric acid, and I never found any relics of the old picture after they had been well sluiced in abundant water, not even when mercury had been used to intensify.—I am yours, &c.,

April 12, 1900.

J. F. T.

OZOTYPE.

To the Editors.

GENTLEMEN,—Some time ago Mr. Manly told one of your correspondents that there would shortly be on the market an improved solution and tissue for the practice of Ozotype. I have seen nothing of this since, though I have looked out anxiously for it, and should be glad to learn if there is any prospect of an early redemption of the promise.

Whatever the advantages of carbon are to the professional photographer, it has the disadvantage to the amateur, who only wants very few prints from any one negative, that experiments are necessary to ascertain the proper exposure for the picture, and that they have to be repeated for each negative, and the results noted. Platinotype does not require this, as a very short experience enables one to print with fair certainty. Ozotype promises to put carbon printing in this respect on a par with platinotype. This would be a great boon to amateurs, for the black tones of platinotype do not quite meet the wants of all subjects. I very seldom lose a platinotype print when the weather is decent, but should, I fear, lose a good many in carbon as at present worked.—I am, yours, &c.,

J. F. T.

A CINEMATOGRAPHIC FEAT.

To the Editors.

GENTLEMEN,—Knowing your desire for accuracy in noting any photographic achievement, I beg to point out the fact that the feat you give publicity to has been beaten some time ago by the British Mutoscope and Biograph Company, Limited, and a record established which will be very difficult to break.

I will not trouble you by citing innumerable parallel cases with the above, as they are an every-day occurrence with the above Company, but, as an instance of marvellous dispatch and organization, the following, I think you will agree, makes the record:—At the Crystal Palace, in May last, at the opening of the Article Club by H.R.H. the Duke of Connaught, the arrival of the Duke and Duchess, just before one o'clock, was photographed on a film of considerable length, the negative developed, dried, and a positive printed, developed, dried, and prepared for exhibition, and shown upon the screen at the Crystal Palace (Biograph Pavilion), at three o'clock the same afternoon.

The developing, printing, &c., was all done in an improvised dark-room, fitted up expressly for this picture, where the great facilities the Company have in their extraordinary dark rooms at Windmill-street, were missing. I may also instance, as an equally great feat (showing

what perfect organization can do), the Grand National Race of last year, when the finish of the race at Liverpool, late in the afternoon, was brought to London and shown at the Palace Theatre the same evening, all the developing, printing, &c., being done at Windmill-street. Every week at the Palace Theatre events taking place in the afternoon are shown the same evening, and, during the last few months, war pictures have been shown with marvellous quickness after the event, that to give you any details would occupy too much of your valuable space. Hoping you will insert this, as your leaderette might create a false impression, except to those familiar with the Biograph at the Palace Theatre.—I am, yours, &c.,

W. P. DANDO.

18 & 19 Great Windmill-street, London, April 13, 1900.

EXHIBITION OF THE SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

To the Editors.

GENTLEMEN.—In connexion with the Fifth Annual Congress of the South-eastern Union of Scientific Societies, to be held this year at Brighton on June 7, 8, and 9, a photographic Exhibition is being organized to illustrate the various applications of photography to scientific work. The Exhibition will not be limited to work done by members of the affiliated societies, but the Committee will welcome any offers of loans that would be likely to prove interesting and instructive. Should any of your readers desire to send exhibits, either in the way of prints or lantern slides, I should be glad if they would communicate with me not later than May 7.—I am, yours, &c.,

H. E. TURNER,

Hon. Photographic Secretary.

Lindfield Lodge, Folkestone, April 16, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

A. Wragg, 30, Burscough-street, Ormskirk, Lancashire.—Photograph of Ormskirk Parish Church.

E. Eccles, 15, Broad-street, Bury, Lancashire.—Four photographs of Mr. James Byrom, Mayor of Bury. Photograph of the Bury Football Players.

REFERENCE.—C. T.—If your late employer refuses to give you a reference, there is no law to compel him to do so. It would be useless for you to go to the County Court on the matter.

R. G. (Manchester).—The paper is not manufactured in England, but you may obtain it of the agents, Messrs. Otto König & Co., 27, Cross-street, Finsbury-pavement, E.C., or through a photographic dealer.

COLLOTYPE WORKER. We have some recollection of the attempt to float the Company, but none of the publication of any details of the process, which we were privately informed was some form of collotype.

STEREOSCOPIC RELIEF.—STERO. The exaggerated relief in the slide is due to the lenses being much too far apart for a subject so very close to the camera. In this instance they should not have been separated more than two or two and a quarter inches.

SANDARAC SOLUTION.—W. CONWAY writes: "Is not gum sandarac soluble in methylated spirit? The book says it is, but the man from whom I got some (sample enclosed) says it is not. Any how, I cannot get it to dissolve."—The sample sent is not sandarac at all, but a common kind of gum arabic, which, of course, is not soluble in spirit.

BOOKS WANTED.—E. JONES writes: "Will you please tell me of a book on portraiture without a studio, and also a book on retouching, and where they may be obtained?"—*Home Portraiture*, by Richard Penlake, published by L. Upcott Gill, 170, Strand, W.C., price 2s. 6d.; *The Art of Retouching Negatives*, by Robert Johnson, published by Marion & Co., Soho-square, W., price, we believe, 2s.

BOOK WANTED.—H. GREAVES writes that, as a reader, he will feel obliged if we can favour him with any information as to how or where he might purchase any book publication on the working up of bromides in black-and white, as also on retouching, that is to say, giving best instructions on same.—In reply: Johnson's *Art of Retouching, and How to Finish and Colour Photographs*, published by Marion & Co., Soho-square, W., should suit our correspondent.

ALTERATION OF FOCUS BY STOP.—T. ABRAHAMS says: "I have a rapid rectilinear lens (no name), and when I focus it with the full opening and get a sharp image, and then put in a smallish stop, it does not seem so sharp as it did at first. Why?"—The lens evidently has a considerable amount of spherical aberration. You will have to focus with the stop with which the negative is taken, or one a size larger, when the light is too feeble to see with small stops.

PRINTS ON SALE OR RETURN.—STATIONER writes: "An amateur here asked me to sell some of his views, saying he would send some on sale or return. I sold a few and returned the rest. He refuses to take them back, and wants me to pay for the lot, saying that, as I put them in the window, they had turned yellow and are no good to him. Can he recover?"—Certainly not, if they were supplied on sale or return. If the prints have turned yellow or faded, that is his fault—his careless work.

VEILED LANTERN SLIDES.—FOG complains that all the slides he develops with ferrous oxalate have a veil or deposit on the surface. As he prefers the colour given by this developer, he wants to know how to avoid the veil.—The water used clearly contains lime, and the deposit is oxalate of lime. The only way of avoiding it is to employ distilled water, or water free from lime. The deposit may, however, be easily removed. Simply flow over the plate a little very dilute hydrochloric acid, which will dissolve it at once, leaving the picture clear and bright.

PHOTOGRAPHIC SUPPLIES ON THE NORWAY STEAMERS.—INQUIRER writes: "I should be greatly obliged if you can inform me whether it is correct that during the visitor season to Norway the boats are fitted with a photographic store for the sale of photographic materials; and, if so, I should be glad if you can give me the name of the firm or firms who have the right of sale."—In reply: We believe that dry plates and other photographic materials are obtainable on the Norwegian steamers leaving Newcastle-on-Tyne. For the name of the firm having the right of sale, we must rely upon some reader who has made the trip.

WATER.—1. The hardness of the water is caused by the presence of lime. The well-known Clark's test consists of the addition to the water of a solution of soap in alcohol; the quantity of soap in the solution is known, and, according to the quantity of soap used in producing the desired results, so the degree of hardness of the water is determined. 2. Desirable, certainly. 3 and 4. Lime salts are deposited in prints, negatives, &c.; though, chemically, their presence may be disregarded. 5. Not by a mere attachment to a tap that we know of; your simplest plan will be to boil the water you use for developing, toning, fixing, &c. This will get you over your difficulties.

COPYRIGHT.—COPYRIGHT writes: "Will you kindly tell me (1) if I can now copyright an old view negative, which I recently lent to be copied on to an illuminated address, and which would give me power to stop the sale of collotype copies which are being offered. (2) Also if I can claim damages for copies already sold, as I know the number of copies that have been supplied to the dealer. I have been so badly treated in the matter, and don't wish to take any action unless I get further annoyance. So far as I can remember from your Correspondence columns, registration would be as effective now as if it had been done at first. (3) You might also tell me what issue of THE BRITISH JOURNAL OF PHOTOGRAPHY contains copy of the Copyright Act."—In reply: 1 and 2. Registration can, of course, be made now; but we doubt if any action you brought would have a retrospective effect in the recovery of penalties, &c.; but for infringements after the date of registration you could, of course, recover. 3. It is printed in our ALMANAC for 1900.

LENS FOR STUDIO.—EDWIN MATTHEWS writes: "In the Answers to Correspondents column of your issue dated March 30, in reply to 'Craniot,' you say you do not know of a lens that will take 'full lengths' in a studio of 15 ft. length. I am working professionally in an ordinary bay-windowed room, and have only a space of 14 ft. 6 in. from background to lens, and in that space I manage both 'full lengths' and other styles (cabinet). The lens I am using, is a $6\frac{1}{2} \times 4\frac{1}{2}$ Special Rapid portrait lens by Houghton & Sons, and the price (don't laugh) 2l. 15s. I enclose a few prints, all taken with this lens. You will admit, I think, they are not bad, considering the conditions. I shall be glad to give any information in my power to your correspondent."—There is a wide difference between working in a studio but 15 ft. long, and having a space of 14 ft. 6 in. between the background and lens. The camera, stand, and operator require another two or three feet. The full-lengths sent, with one exception, are children, the exception being a lady of short stature placed quite close to the background. In this, the bottom of the dress is quite out of focus. What is generally understood, with reference to lenses, for full-length portraits, is of adults of average height, say, five ft. eight or nine, and that is what opticians mean in their catalogues.

STUDIO-BUILDING.—C. F. A. writes: "1. I intend erecting another studio, and near the glass side there will be a stone wall, about 3 feet 6 inches high at one end, and 4 feet 6 inches at the other. How near could I come to that wall without interfering with the light of studio? The glass side of studio will be next the wall, with N.E. aspect. 2. What focal length are portrait lenses used for general purposes—say, for taking full-length *cartes-de-visite* to cabinet groups? Or, in other words, what would be the most suitable focal length for general professional work, excepting large groups? 3. Would a studio 20×8 feet be large enough for such work as that mentioned? 4. As a length of 25 to 30 feet is recommended for a studio lighted at both ends, would 15 to 20 feet be long enough for one intended to be wrought from one end only, and be efficient for professional work? 5. What would be the most suitable focal length of lens for a studio 20×8 feet?"—1. If you get 4 or 5 feet from the wall, there will not be much light obstructed. 2. The lens most generally used for full-length *carte-de-visite* portraits is about 8 inches equivalent focus, and for full-length cabinets about $11\frac{1}{2}$ inches. Both these lenses require a distance of 18 feet between sitter and camera. 3. The studio would be too short for either of these lenses, therefore shorter-focus ones must be used. 4. The lighting has nothing to do with the length of the studio. 5. For full-length *cartes*, 6 inches, and for full-length cabinets, about $8\frac{1}{2}$ or 9 inches.

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EX CATHEDRÂ.

WE are happy to announce that the third Traill Taylor Memorial Lecture will be delivered in London next November by Mr. F. E. Ives. The subject of the lecture will be "The Optics of Trichromatic Photography," and the author will treat of it in its historical and practical aspects with illustrations and demonstrations. Mr. Ives promises to show some new devices of his own, which he is reserving for first exhibition on the occasion of his lecture. In all probability the lecture will be delivered at the House of the Royal Photographic Society in Russell-square, and may be relied upon to attract a large and interested audience. Mr. Ives has been engaged for over twenty years in studying the application of the colour-sensation and colour-vision theories to photography, and has probably added more to our knowledge of this fascinating subject than any other living experimentalist. In our ALMANAC for 1899 we briefly summarised his heliochromic work, the full record of which has occupied a large part of our space for many years past.

PHOTOGRAPHERS nowadays have little to do with dangerous chemicals. The case was different in the collodion days, when a good supply of ether was generally in stock, and cyanide of potassium was the general fixing agent. At present photographers have little use for collodion, except for enamelling, when a little ether is often required for thinning it. Many amateurs, however, are not aware of its dangerous properties, and that its vapour is highly inflammable at ordinary temperatures, and, when mixed with a certain proportion of air, highly explosive. Last week two serious accidents in London from volatile chemicals were chronicled. One was from an explosion of ether, when several men were knocked down and two so badly injured as to necessitate their removal to the hospital. The other was from the bursting of a carboy of bisulphide of carbon, when two shops were wrecked, though no one, except from broken glass, was injured. Although the newspaper reports attribute the explosions to the bursting of a bottle of ether in the one case and of a carboy of bisulphide of carbon in the other, there is little doubt the explosions that did the damage were due to a mixture of the vapours with atmospheric air. Those photographers who have to do with volatile chemicals, such as ether, benzole, bisulphide of carbon (one of the solvents of indiarubber), and the like that give off inflammable vapours, should, for safety, store them in a cool out-house during hot weather, as they may expand, burst the bottles, or blow out the stoppers, and let the highly inflammable and, under some circumstances, explosive vapour escape, when, if a light is brought near, a serious accident may happen.

* * *

At a recent meeting of the Edinburgh Photographic Society a paper was read on paper-making, with special reference to its photographic uses. The author made reference to the fact that the British paper-manufacturers hitherto had not been able to supply a photographic paper, and that photographers had to go to the Continent for it. We have often commented on this fact, and expressed surprise that the whole of the photographic paper used throughout the world is made at two, or at most three, German manufactories, where the output must be enormous. The price they charge for it is considerably in

excess of the best English papers, therefore it is much to be wondered at that British makers do not enter the field with a suitable photographic paper; still more so, remembering that, in the old calotype days, it was only English-made papers that were found suitable for the negatives—Turner's, Hollingworth's, Whatman's, &c. It is evident that British makers let the photographic paper trade slip out of their hands, and, so far as we are aware, have made no serious attempt to get it back again, and that is not a little surprising. Although this country is dependent upon Germany for its photographic paper, large quantities of the best British papers go to Germany. A friend of ours, travelling in Germany last year, asked at two or three different stationers' shops for the best quality letter paper, and with each purchase the water-mark bore the names of our best manufacturers.

* * *

THE Danish police, like their *confrères* here, evidently utilise photography, for we read, in a telegram from Copenhagen, that a report on the examination of the royal saloon car in which their Royal Highnesses the Prince and Princess of Wales travelled when the dastardly attempt was made upon the Prince's life had been sent to the police at Brussels. This report was accompanied by some five or six photographs of the interior of the carriage, as well as the bullet that had been found. In some countries on the Continent, we are told, photography is more largely employed by the police than it is here, and that the work is, as a rule, of a better quality technically. We are sorry that we cannot accord a high standard of excellence to the general run of the photographs produced by our Police department.

* * *

MESSRS. DAWBARN & WARD, Limited, of 6, Farringdon-avenue, E.C., draw our attention to two lists they are issuing, which should find very widespread uses. The one is a list of books and periodicals supplied by the firm. The portion of this list which relates to photography occupies eight closely printed pages, and it includes all standard books on the subject that are in current request. Some such list as this was greatly needed; for, although it carries completeness to the point of including many rubbishy productions which the photographic world can easily do without, its handiness as a source of reference may be depended upon to constantly assert itself. The second of Messrs. Dawbarn's lists relates to the Index of Standard Photographs—"age cannot wither nor custom stale" our unalterable objection to that dreadful word photogram—which aims to be a guide to the hundreds and thousands of subjects in the collections of photographic publishers and professional photographers. We learn that this list has grown from an estimated 112 pages to over 300 pages, and the subscription has consequently been raised to fifteen shillings. Editors, publishers, and others should find that outlay a highly profitable investment, for a list of photographs like that given in the Index is of incalculable value.

* * *

OLD BOND-STREET on Saturday morning last witnessed the speedy gathering of a typical London crowd full of vocal enthusiasm for one of the heroes of the hour, Sir George White, the defender of Ladysmith. It appears that Sir George, who was repairing to the handsome studio of Messrs. Langfier, Limited, of 23A, Old Bond-street, for the peaceful purpose of sitting for his portrait, was recognised by the

passers-by, who rapidly congregated in considerable numbers and cheered the gallant General to their hearts' content. We understand that Messrs. Langfier, whose skill and enterprise are undeniably great, took several excellent negatives of Sir George. It is to be hoped that it will not be long before his fellow-generals who are still fighting in South Africa will find themselves confronted with no more arduous task than that of facing the photographer's lens in the capital of the Empire they are serving.

* * *

LAST week the Artistic Photographic Company, Limited, of 72, Oxford-street, London, W., published a two-column advertisement in the *Daily Telegraph* relating to a free gift for a limited period to every reader of that journal, simply as an advertisement. It ran as follows: "In order to further increase the popularity of our renowned permanent guinea enlargements, which we reproduce from any ordinary photograph for the exceedingly small sum of 5s. 6d., we have decided to present each purchaser, with their first order, for a limited period, a charming little miniature on porcelain, framed complete, in chaste English-made gilt frame. Instructions: Send us a photograph (*carte-de-visite* or cabinet) and we will reproduce from the same a beautiful photographic enlargement, guaranteed absolutely permanent, skilfully finished by hand, and handsomely mounted on plate-sunk India tint mount, measuring 18 x 14½ inches, resembling a rich steel-plate engraving, for which one guinea and upwards is usually charged, together with a miniature, as before stated, for the small sum of 5s. 6d. inclusive."

* * *

THE advertisement elsewhere says that it is "almost incredible that for 5s. 6d. we [the Company] reproduce a large portrait, equal in every respect to those for which ordinary photographers charge from one to two guineas." It is not by any means the first time that we have called attention to advertisements of this kind, offering the public low-priced bromide enlargements for which it is said that photographers charge pounds or guineas where only shillings are asked by the enterprising firms who conduct profitable businesses by almost giving photographs away. The Artistic Photographic Company know perfectly well that five-and-sixpenny bromide enlargements are not sold for one or two guineas, and that consequently ordinary photographers do not make such charges for work obviously not worth it. We suggest that in future they omit such erroneous statements from their advertisements. It will not harm their business one bit, but it may save "ordinary photographers" from the possible charge of making exorbitant profits.

* * *

A FRIEND who occupies a prominent position in the photographic world sends us a copy of a circular issued by Mr. Walter McIntosh, of 46, Ryevale-road, Balham, London, S.W. This refers in glowing terms to an instrument termed the realistoscope, obviously a stereoscope, and to the wonderful effects seen in the realistographs, commonly called stereoscopic slides, when viewed by that instrument. We must do Mr. McIntosh the justice of saying that his eulogies of stereoscopic photography are expressed in ornate and glowing language which excites our deepest envy; we can never hope to approach him in the power of investing binocular work with a wealth of verbal glory such as Mr. Swinburne himself might find it

dicult to equal. We have no recollection of having seen any Mr. McIntosh's realistoscopic work, and are therefore prised to find in his circular that we are quoted as terming "beautiful and fascinating. They" [some slides], we are de to say, "will bear examination and re-examination." reover, "The Editor of the *Photo-Almanac*" (reference presumably being made to ourselves and our ALMANAC) is also dited with this criticism: "An elegant, interesting, welcome lition to the drawing-room table. The effects must be seen be adequately appreciated. 'A thing of beauty,' it will phatically prove 'a joy for ever.'" Whenever we pass an nion in these pages or in those of the ALMANAC, we have no lection to its reproduction, but we demur to having thrust on us the paternity of sentiments that have an alien origin. Probably Mr. McIntosh's stereoscope and his binocular slides all that he says they are; but, as we have not seen either one or the other, we must ask those of our readers into whose hands his circular may fall to note that we are not responsible for the favourable criticisms Mr. McIntosh assigns to us.

VIGNETTED NEGATIVES AND VIGNETTING.

An article a few weeks ago we described a few methods of producing vignetted negatives so as to avoid the vignetting in printing. From communications since received we judge that the idea of making vignetted negatives was quite a novelty to many, while, as we explained, it is one of the oldest methods of producing this style of picture. Since the present system of making vignettes, namely, by vignetting each print in the printing frame, became almost universally adopted, very little improvement seems to have been attempted to improve the artistic appearance of the pictures. They are simply the figure shaded off into blank space, sometimes cleverly done, at others just the reverse. Often the negatives are taken with a light background placed behind the sitter, sometimes with one with a light landscape scene, or, indeed, with any other that may be in general use at the time. Some photographers, however, who produce the best vignetted portraits employ special backgrounds for them. These are light at the top and shaded off with cloud-like effect towards the bottom. Such backgrounds are a great aid to the printers, as they render the vignetting easier in the printing.

Amateurs generally employ vignetting glasses or the vignetting masks, with the conventional oval or pear-shaped openings, sold by the dealers for the purpose. Professionals, however, usually employ masks, which they make themselves to suit the subject, cut out of cardboard, brown paper, zinc, &c., placed at the distance in front of the negative while printing; the further the mask is from the negative the softer and more delicate, of course, is the vignetting. A very light background, as first mentioned, is an assistance to the printer, but it does not in most cases improve the effect of the portrait, it being usually almost of the same tint in the print as the lighter portions of the face and the dress; whereas a darker one would throw out the portrait better if it were softly and delicately shaded off, but that would naturally increase trouble and involve more skill on the part of the printers. However, vignettes as they are now made are unquestionably very popular with the general public, and in all probability will continue to be so for a long time to come. Although that is the case, is there any reason why they should not be improved upon? In the majority of cases there is ample scope for it.

It is a noteworthy fact that, while the uniform shading off of the background and figure in direct prints is almost universal, the case is different with worked-up vignetted enlargements. Here the artist usually introduces a little sketchy hatching, or cross hatching, in the background, and where the figure is shaded off somewhat after the style of the celebrated Richmond drawings. This when artistically done—which, by the way, is not always the case—greatly enhances the picture. That being so with enlargements, why should it not be so with direct prints?

Our older readers will remember the photo-crayon portraits of thirty or more years ago, and the favour they met with at the time, that is, in the hands of those who could produce them successfully. When skilfully done, these pictures could scarcely be distinguished from veritable crayon drawings, although, as a matter of fact, there was not a particle of hand work upon them; consequently they were very profitable to their producers. For the benefit of our younger readers, we will explain what they were, and how they were produced, as it will serve to illustrate our remarks on the effect that a little sketchy work has upon a vignetted photograph. An enlarged transparency by the wet-collodion process, vignetted in the camera, was made usually on a 15×12 plate. It was imperative that this transparency—and here was the difficulty—must be exceedingly thin, though full of detail in every part; indeed, it was but a phantom image when viewed by transmitted light. This transparency was simply backed up with a piece of white or tinted crayon on paper, upon which some sketchy hatched lines were lithographed. The hatching, of which there were different forms, was so located that it just came where the picture and background was vignetted off, and gave the finish. The effect, as we have just said, was scarcely distinguishable from a well executed crayon drawing, upon which a considerable amount of skill and time had been expended. The difficulty that many found in making these pictures was in getting full detail in the transparency while it was thin enough, and of suitable warm black colour by reflected light. These pictures were the invention of the late Mr. Napoleon Sarony.

The above named gentleman, about the same period, also introduced hatched vignettes, direct prints, after the style of the Richmond heads. We shall now describe how they were made, as the methods may serve as a hint to those who, at the present time, may desire to improve the present style of vignettes, making, of course, such modifications in the systems as may suit their practice. One of the methods was vignetting the negatives in the camera, and that, on the whole, is the more simple plan, inasmuch as no vignetting is required in the printing. A mask, with a suitable opening for the subject, is placed in the camera, well out of the focus of the lens, similar to that described for producing dark vignettes a few weeks back. After the portrait has been taken this mask is replaced by another—its counterpart—which protects only the previously exposed portions of the plate. A white screen, upon which there are some suitable sketchy, hatched lines, is then placed in front of the camera, and the lens focussed upon it, and a second exposure made. We now get the figure vignetted into the hatching, with a margin that is quite opaque.

Another method of getting a similar result, in the finished picture, is by double printing. In this case a vignette is made in the printing frame in the usual way. Then a negative, taken in the camera, of a hatched drawing on white paper, is placed on the print and exposed to light, though not

deeply printed. The opaque portions of this negative will protect the parts already printed, and the effect in the finished picture is very effective and artistic. It is scarcely necessary to mention that a series of negatives, with hatching to suit different subjects, is essential, as it also is when vignetted negatives are made in the camera, for it is obvious that what would suit one subject might not be suitable for another. What would suit a three-quarter figure would by no means suit for a head and bust.

At the time that Mr. Sarony introduced this style—about 1865—the *carte-de-visite*, on glossy albumen paper, with purple-brown tones, was all the rage, and these pictures, though novel, were not quite in keeping with the celebrated Richmond heads—the pictures were incongruous. The case would be different now with cabinets on platinum papers. We recently saw some platinotypes in this style that were very artistic and effective, and they were very unlike ordinary photographic vignettes. They very closely resembled small crayon drawings, as the paper was rather rough. Of course, a still rougher paper might be employed for larger portraits with good effect. We commend the idea to professional portraitists who may be on the look-out for a novelty for the season.

A Long Eclipse.—As additional to our remarks upon eclipses in our last, it will be of interest to note that the 1905 eclipse we referred to as occurring in a district within easy distance from this country is specially remarkable in one respect—the length of time the sun's disc will remain obscured. It is by no means probable that any one viewing that will again have the opportunity of photographing the phenomenon for so protracted a length of time. It is impossible, of course, to predict what science may do for human longevity, but it is fair to assume that it will not help a man to live to the age of over three hundred, that being under the time that will elapse before a totality of nearly three minutes and three-quarters—the duration of the 1905 eclipse—will occur. Time, an hour after midday, August 30, 1905; place, in central line, Burgos, Spain, is a date to make a note of.

Minimum Limit of Star Magnitudes.—Our readers are, of course, aware that the smaller the magnitude of a star the longer the exposure necessary, and it might be supposed that, granted suitable means for keeping the image always on one spot, there would be no limit to the magnitudes that could be photographed if exposures sufficiently protracted, extending say over several nights, were to be given. But in practice it is not so, there is a practical limitation existing, governed by "atmospheric glare." So far as this country is concerned—in dry countries at high elevations the limit might possibly be extended—Dr. Roberts, practice indicates, as far as can at present be predicated, that, when a plate has been exposed for a sufficient number of hours, for a star of the eighteenth magnitude to be impressed, the fog brought about by the photographic power of the atmosphere itself, or of the natural luminosity of the sky, is so great that any increase of exposure would produce "fog" sufficient to overpower any star image whose luminosity was in defect of that of an eighteenth-magnitude star.

Becquerel Radiations.—The study of the field so ably worked by M. and Mde. Curie is fertile in new discoveries. M. M. A. Debierne appears to have separated—in an impure state, certainly—another new substance with active radiation power. At present it has only been obtained in an impure state—in fact, a sort of impure thorium; but it is shown that the new metal is not either polonium or radium, the Curies' discoveries, though all of the trio are extracted from a similar source—the residues obtained after the treatment of pitchblende.

The Eclipse at Sea.—The Orient Line, in the interest of those who might like to see the eclipse from the deck of a steamer, have arranged to so navigate their Royal Mail steamer *Ormuz* as to

bring the vessel off the coast of Portugal, during the eclipse, upon the central line of totality. The course of the vessel is from London or Plymouth to Gibraltar or Marseilles, and the trip will occupy fifteen days. The *Ormuz* is to leave London on the 25th proximo.

The Picture Season.—Next week the Royal Academy will be opened. The Spring Art Exhibition at Vienna is now open, so is a loan Exhibition of paintings at West Ham, as well as the annual show, under the auspices of the Corporation of the City of London, at the Guildhall. Several other exhibitions of pictures will also be open shortly. The Exhibition at the Guildhall this year is confined to the work of British artists only, and only one picture by the same painter is shown. This gives students the opportunity of seeing and comparing within a small space the distinct styles of the different artists better than perhaps could be done in a larger exhibition, such as the Tate Gallery. There are in all 115 paintings by the same number of artists. Many of the works are loaned from the permanent collections of several other Corporations—Manchester, Birmingham, Liverpool, Leeds, Nottingham, Glasgow, and other towns. The National Art Galleries of Sydney, N.S.W., have also contributed from their treasures. This Exhibition will remain open, Sunday afternoons as well, for several months. Photographers will do well to visit the pictures, as they will probably never have the opportunity of seeing such a collection again in a single building.

IN connexion with the Vienna Art Exhibition we read that the small gold State medal has been awarded to three British artists. One of the chief arguments of the advocates of the abolition of medals at photographic exhibitions is that the Royal Academy gives none, yet British artists compete for them on the Continent—or, if they do not compete for them, we have never heard of an instance where they were refused because their acceptance would be *infra dig.* when awarded. In most of the annual exhibitions at Munich R.A.'s and A.R.A.'s come in for some of the medals, and we have little doubt they are highly appreciated by their recipients.

JOTTINGS.

THE copyright agitation may as well be relaxed for the present, a Lord Monkswell's new Bill, which was read a second time in the House of Lords last month, and referred to a Select Committee, was Governmentally declared, by the mouth of Lord Balfour of Burleigh to have no chance of passing into law this session. It has to be submitted to colonial opinion and criticism, and after that to make its way through the two Houses of Parliament at home—a long journey through a hostile country, to be sure; for the friends of photography cannot hope that an almost idyllic measure, which classifies the productions of the camera as artistic work, gives protection for life and thirty years afterwards, and abolishes compulsory registration, will escape the unpleasant attentions of the little knot of painters and publishers who are in league for the purpose of persuading Parliament that the photographer has no mission in life except to be the prey of unsympathetic competitors. But I have mis taken the temper of the Copyright Union if, next year, when the Bill is under consideration, past experience is not taken as a guide in preventing, as far as possible, the conversion of a measure by means unfavourable to photography into such a scandalous attempt at spoliation as that which formed the subject of discussion at the Society of Arts a month or two ago.

MEANWHILE a new and closer danger threatens those photographers whose work is reproduced in the illustrated newspapers. From the evidence that has been placed before me I conclude that an offensive alliance exists amongst the conductors of those publications, and that their immediate aim is to force the minimum right of reproduction fee of half-a-guinea down to five shillings. Photographers are being asked by circular to agree to accept the smaller sum where a photograph is reproduced a second or third time, and to sign an agreement to that effect. I know of cases where such a request has met with emphatic refusal, and I have been asked to warn photographers not to walk into the trap that is so cunningly prepared for them. It is clearly a move on the part of the illus-

rated journalists to make the minimum fee five shillings, for, of course, the inducement held out to the photographer is that three reproductions at 5s. each are more remunerative than one at 10s. 6d., and its partial success, which is not improbable, will help to make photography for reproduction purposes less and less remunerative. For years past many newspapers have offered from 5s. to 10s. 6d., as reproduction fees; and so we get an idea of what they think the minimum and maximum payments should be. And this differs from the ideas of the Photographic Copyright Union.

LAST month I announced that Dr. P. H. Emerson would have a "one-man show" of his famous photographic work at the Royal Photographic Society's House in June next, and now I can add the further information that, on the opening night of his Exhibition, he will personally deliver an address on the subject of his photographs. These are being specially framed for the purpose, and, as I have often said in these pages, they will be a revelation to many of those who have only recently taken up photography. It must be eleven or twelve years—in the old days of the Camera Club in Bedford-street—since Dr. Emerson addressed a London audience. Himself one of the most virile and fascinating figures in the photographic world, the charm of his manner and style, not less than his perfect fundamental knowledge of pictorial photography, will undoubtedly assure him a great reception when he opens what I venture to say will be the most interesting of the series of one-man shows the Royal Photographic Society is now holding at Russell-square.

THE Third Annual Dinner of the Plate and Paper-makers' Association, which takes place on Wednesday next, is another reminder of the force of the saying that threatened institutions, like threatened men, live long. When the Association was first formed, its early decease was widely prophesied, and I am giving away no secret in saying that some of its present supporters were amongst those who boded, if they did not actually wish, disaster to the movement. There is no doubt that, in regulating discounts and attacking the evils of price-cutting, the Association has done good work, and, though in minor matters of policy it may be open to individual criticism or disapproval, its influence, on the whole, has made for the advantage of all branches of British photographic trade. By the way, the Association and the Copyright Union, to which I have already referred, parallelise at several points, for the latter body numbers among its objects the prevention of the cutting of prices in copyright fees, the protection of its members against unfair or illegal methods of doing business, and so on. It is only through the neglect and apathy of photographers that the Union, in its own wide sphere of action, is not so successful as the Association undoubtedly is in its broad field of activity.

THE revised rules for the guidance of Judges at Photographic Exhibitions are in my humble opinion deficient in one important respect: they give the Judges power to exclude from the exhibition room, while the adjudication is in progress, "all persons," which obviously includes exhibitors and others interested in the destination of the awards, but the rule is not made obligatory. It is only too frequently the case that judging has to be done under the very eyes and noses of a group of covetous competitors. I have been told that the most unblushing attempts are sometimes made to influence the awards by members of a society holding an exhibition. If the rules included a provision that no competitor should be present at the time of judging, a great deal of embarrassment and unpleasantness would be avoided. It is too much to expect, I suppose, that competitors could be prevented from hanging round exhibition entrances, and directing the attentions of Judges on their arrival to the precise position of their photographs, and it would be difficult, if not impossible, to stop letter-writing to Judges with the object of influencing awards. But this sort of thing is and has been done, and I for one am determined, the next time any of it comes under my direct observation, that the culprit shall be publicly exposed. The medal-hunter who recoils from no dirty trick to secure a paltry disc of metal is a despicable person who, in the language of Mr. Alderman Cuite, should be "put down."

I AM much obliged to my friend, Mr. Edgar Scamell, who, on the 30th ult., was kind enough, in answer to my request for information about the exact status of the National Photographic Record Association, to send a copy of the rules, the annual report, and other details, showing that that body stands on a firm basis and is likely to have a continuity of administration. What I was anxious to elicit was whether the present excellent work which the Association has taken in hand was likely to be carried on if, at any future time, there should be a change of officials, and Mr. Scamell's letter assures me it is. That is all. I trust the Association will go on and prosper, and that future generations will thank it for accumulating a large collection of permanent photographs illustrating buildings scenes, customs, and so forth, which Time is doing his best to improve out of existence. The Exhibition which has just closed at Russell-square attracted a great amount of attention, though some of the prints shown will probably give posterity a very poor opinion of the photographic abilities of some of the contributors. However, the Association's objects are excellent, and I hope to live to see what it has done, and is doing, more widely known and appreciated than it is at present.

SPRING has come at last, and outdoor photography is therefore now possible, under conditions of personal comfort and with natural surroundings that make landscape work peculiarly attractive. The young bright green foliage and the blossoms that cover the country look singularly beautiful on the ground glass, at any rate. I have often thought that the life of a travelling photographer, journeying by caravan from village to village, for six or seven months a year, must be a pleasant one. Quite recently I was assured by a gentleman who has taken up this branch of professional work for a living that it is not only pleasant, but profitable. He is on the move from April till October, staying a week or so in each place. The whole photographic equipment is drawn by road. I believe the retouching, printing, and mounting are done on the spot, and the enlarging put out. My friend smilingly said that perhaps this kind of photography is a little *infra dig.*; but, then, what it loses in dignity—if indeed, there is any loss in that direction—it gains in profit and pleasure. It is a mild kind of gipsying, and therein lies its element of attractiveness, I suppose. After all, a vast part of the world's business is done on the road. Actors, musicians, singers, and others of the kind, travel from place to place for a living, so why not photographers? And where does the loss of dignity come in?

GENERAL WATERHOUSE, in a letter to the Editor of *The Journal of the Photographic Society of India*, in which publication so many valuable writings of the distinguished experimentalist have appeared, touches a note which will find an echo in the minds of all earnest students of photography. "There are many scientific problems requiring attention, which busy people cannot give them," writes General Waterhouse. Perhaps there could be no more effective rejoinder to a statement recently made in my hearing, that there was very little left to discover in photography. The truth is that no matter in which direction one turns, photography, at the end of the century, presents many avenues of experimental research, into which scientific inquirers are only just penetrating. Most of the advances that have been made in colour work, in optics, in chemistry, during the last twenty-five years, a period of time covered by gelatine photography, still leave many "scientific problems requiring attention," as General Waterhouse expresses it. An utterance of this nature from such an authoritative source is deserving of every respect, for it will serve to remind practical workers, who are prone to think scientific investigation has said its last word on their behalf, that finality of knowledge in photography has not yet been reached. New discoveries may be slower in coming than in past times, but it is because, as General Waterhouse hints, individuals become busier with the march of the years. To day the man of science, above all others, finds himself improving upon Goethe, and, crying "Time, Time, give me more time." The most valuable ally of Science is Time.

COSMOS.

DO NEGATIVES FADE?

THE announcement made by Dr. Roberts, in his recently issued volume of *Astronomical Photography* that the images on gelatine negatives are liable to fade after a time is new to many. The Doctor mentions that a negative, in which, when first taken, he was able to count 403 stars, after the lapse of about nine years 131 of them—about one-third—had disappeared. This is a serious matter for the scientific world, seeing that the whole of the negatives now being taken under the international scheme of mapping the heavens are by the gelatino-bromide process. If the smaller stars are liable to fade out of the negative after the lapse of a few years, many will possibly have disappeared before the chart is completed, consequently much of its astronomical value will be curtailed. Gelatine prints are well known to be liable to fade, but negatives that have been *carefully* manipulated have hitherto been above suspicion. We have italicised the word "carefully" because we all know that negatives that have received but perfunctory treatment are likely to change with time; but that is scarcely probable to have been the case with Dr. Roberts's negatives, for it cannot be assumed that any point would be neglected in the production of such a valuable series for the object in view. This brings us to the question, Do gelatino-bromide negatives necessarily fade?

If they do, the matter is of importance to every photographer who has negatives that are valuable now and likely to continue to be so in the future. Of course, in the star negatives the images of those of the fainter orbs are very faint indeed, so also are the most delicate tones of a good portrait or landscape negative, and, if the fainter portions of the image are prone to fade away, after a few years the negative will necessarily become harder and less full of delicate tones. Therefore the matter is of serious import, and it should receive the attention of chemists, with the view of increasing the stability of the negatives produced by the present almost universal gelatine process. In our own practice we have not detected any change in negatives that were made more than twenty years ago, which were carefully fixed in new solutions of hypo and thoroughly washed, then coated with collodion, and afterwards varnished with a hard spirit varnish, although they have been frequently printed from and no particular care has been bestowed upon their storage.

"ANTHONY'S OF NEW YORK."

PROMPTED by the recent removal of the well-known stock house, Messrs. E. & H. T. Anthony & Co., of New York, to larger premises in that city, Mr. Henry Dietrich contributes to *Anthony's Magazine* for April a brief sketch of the history of the firm, which may have some interest for those of our readers who have been brought into business relations with that respected house, and for the far larger number who know it only by reputation—a deservedly high and respected one in the trade. Says Mr. Dietrich:—

"It is now thirty-one years ago (February 10, 1869) that we moved to 591, Broadway, from 501, Broadway, and Mr. Edward Anthony considered it at that time a good move as to locality, space, and business generally. 'Up town' was the cry. Times have changed again, progressive impulse still holds sway, the upward tendency still obtains, and, obedient to its dictates, we once again have moved up town.

"Well do I remember the day when I made my first entry at 501, Broadway. It was in September 1860, in answer to an advertisement I called, but was seriously in doubt whether I should go upstairs or not, seeing nothing at the entrance but a small show-case containing a few pictures and some bottles of collodion and varnish. The firm's name at that time was E. Anthony. I finally ventured upstairs, and great was my astonishment when I reached the upper floor to find it stocked with all kinds of photographic paraphernalia, to me a great mystery. I was engaged, and suggested making a written contract. Mr. Anthony, however, said in his quiet way, 'There is no necessity for it; we consider our position permanent.' He kept his word well in this as in all other matters.

"Pictures on albumen paper were then in their infancy, almost unknown to the general public, and the favourite picture was the so-called Ambrotype, a direct positive on purple glass, with black asphaltum varnish backing, put up in a case with mat, glass, and preserver. The sizes of pictures varied greatly, and included $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{3}{4}$, which last size corresponds with our present $6\frac{1}{2} \times 8\frac{1}{2}$, and occasionally a larger size, which latter were greatly admired and much talked about. It took at this time from three to six glass-cutters, cutting from morning until night, to fill orders and keep up the supply, while three or four young ladies were constantly occupied in fitting the cases. And those cases! I have studied languages, algebra, mathematics, and even buried my youthful

head in trigonometry, but the Ambrotype cases beat them all. They were classified by letters—X, XX, XXX, CVX, RRX, KN hook, KN two hooks, TM snap—and each letter made in a variety of sizes. I was in utter despair when I started, but finally succeeded in becoming thoroughly acquainted with them.

"The frame department, which in later years occupied a whole floor, was at this time just started. A small closet with glass door contained from one to two dozen $6\frac{1}{2} \times 8\frac{1}{2}$ and 8×10 oval glass frames, which constituted the entire stock. It was about this time that the first stereoscope (opera-glass style) made its appearance from Paris. Thus the winter passed, and with the spring of 1861 came the declaration of war. The first shot was fired at Fort Sumter, and New York was in fever heat. The big meeting on Union Square will never be forgotten by those who witnessed it, and few men on that day cared to be seen on the street without a Union badge. No desk, no counting-room, no work-bench was without a flag decoration, and when Mr. Edward Anthony came back to the store from down town at noon-time of that day his silk hat was pierced and decorated by two pretty good-sized United States flags.

"After three years' leave of absence from the store and service in the army I returned to my old quarters. What a change had taken place in that period. Ambrotypes on the decrease, slowly, but surely; prints on albumen paper on the increase, their reputation rising day by day. American manufacturers of albumen paper had already started. On one of the upper floors we manufactured our own albumen paper. *Cartes-de-visite* were at that time the principal style. Stereoscopic pictures and stereoscopes (Professor Towler had in the mean time invented the sliding stereoscope) commenced to be fashionable. A special clerk had to attend to the orders for stereoscopes, which were sold by the gross. The firm's name had now changed to E. & H. T. Anthony, Mr. Edward Anthony having taken his brother, Henry T., into the firm as a partner. Mr. Henry T. Anthony superintended the technical, and, to a large degree, the chemical, part of the business, and was always ready and willing to give advice to the numerous operators, printers, and retouchers from the different galleries, who came to look upon him as the best friend they had.

"Anthony's collodion and varnish had now gained a world-wide reputation, and orders for it by the barrel were frequently received. Albums (in the beginning with openings for *cartes-de-visite* only) had made a favourable entry into the market, and were manufactured in large quantities, and the firm had rented a whole floor in the old New Haven Railroad Building, corner of Franklin and White-streets, where fifty girls and many workmen were employed in their manufacture. Another factory for the manufacture of albumen paper was opened at 65, Broadway. The business had now steadily increased to such an extent that the members of the firm were obliged to look for another partner to relieve them somewhat of the almost too heavy burden of their work, and Mr. W. H. Badeau, a trusted *employé*, was taken into the firm. The firm's name was changed at this time to E. and H. T. Anthony & Company. After a lapse of several years Mr. Badeau severed his connexion with the house, and Mr. V. M. Wilcox, another *employé*, took his place. The number of *employés* had now almost doubled, and the business had increased to many times its original volume.

PROCESS ENGRAVING.

[Abstract of paper read at the Society of Arts and reprinted from its *Journal*.]

My first experience in producing illustrations was in assisting my father in photographing drawings on wood. I remember working for some of the best and leading wood-engravers of that period. My father invented a process for this purpose, which was afterwards adopted by the late John Swain. I have a vivid recollection of a very simple process worked by my father, which he kept secret, it being too simple to patent. He took a photograph, i.e., an albumenised silver print, and pasted the photo face downwards on to the plain boxwood. For pasting he used some special glue of his own; when dry, he merely rubbed the paper away with his finger by moistening it. The paper very easily coming away, the photograph was left on the wood. My father discovered this quite by accident: an old photograph having stuck on a wood block, he started rubbing the paper quite absent-mindedly, when he perceived that the albumenised film of the silver print remained on the wood.

The final step which brings us to the present time, though not by any means, I am sure, to the end of the chapter, is the superseding of the wood-engraver by the mechanical or process engraver.

Photo-engraving, which is in reality process, is older than photography, since Nièpce in 1814 commenced experiments, and in 1824 (if not earlier) actually produced proofs from photo-etched plates. His process was just to purify bitumen and then to coat a silver or pewter plate with it, exposing to light under an engraving or in the camera. The bitumen, where it became insoluble under the action of light, resisted the solvent

action of oil of lavender which was afterwards applied, so that a resist was produced and the plate was afterwards etched. The only records of Nièpce's early experiments are furnished by some correspondence between Nièpce and Daguerre.

Eventually Nièpce entered into partnership with Daguerre and endeavoured to form a company to work their new invention, but without success—capitalists looked upon it as much too risky a venture. Nièpce's desire and object when the first glimpse of photography appeared was to find a substitute for engraving. Letters written by Isidore Nièpce at that period tend to show that from Nièpce we obtained the germ and idea of process engraving.

The first published results of the Daguerreotype process proved that the nitric acid attacked the silver forming the dark part of the image, whilst it had no action on the mercury in the light part. After a few minutes biting the plate was washed, inked up, and proof pulled, but the results were very imperfect, and the plates did not stand printing owing to the softness of the silver.

Fox Talbot's first process was patented in 1852. This process was called phototypy. Up to this time it may be said to have been the most important process of the day. It is curious to note that Talbot, when copying what we now term a half-tone subject, used what he called a photographic veil over the plate. This veil was composed of two folds of thin black gauze; the method was imperfect, but it only shows that, at this time, Talbot was endeavouring to make half-tone blocks by means of breaking up the tones by the aid of a gauze or screen. In fact, he actually suggested the use of those glass plates, ruled with fine lines or covered with opaque dots, which are the basis of half-tone work. But, in referring to this process, it must be borne in mind that it was really a species of photogravure, and was not a process for producing type blocks for printing in magazines or newspapers—his plates had to be printed in a copper-plate press—the plates he made were, however, the first of their kind and very excellent. Talbot may well claim to be the English inventor of photography.

Carl Klic, of Vienna, is said to have improved upon Talbot's methods considerably. The idea of a lined screen was followed by Berchtold, in France, and C. J. Burnett, in England, in 1857 or 1858. In 1861 Baron F. W. von Egloffstein experimented with ruled screens in Philadelphia, and, in 1865, E. and J. Bullock patented and worked for fifteen years a process in which the grain was produced by a line netting of cross lines.

AUTOMATIC ENGRAVING.

The earliest attempts in the direction of automatic engraving were based on the principle of biting away the metal with acids. The great difficulty encountered was to ensure that the action of the acids should be exercised only in the direction required. Nitric acid had a habit of etching away the delicate parts, and even at the present day it is not unusual for this to occur. Many experiments were made, but for a long time the results were failures. It was left to a Frenchman, M. Gillot, to perfect the etching of the line block. I have just received an interesting letter from M. Gillot, jun., who states:—

"My father, who was a lithographic artist, took over a small lithographic business whose speciality was printing small labels. The lithographic method not being quick enough, it struck him to bite or etch the stone deeper, to enable him to print typographically instead of lithographically. Whilst experimenting on this, the idea occurred to him to use metal; he therefore experimented, and successfully succeeded in etching on zinc. This took place about 1848, but the printers were very much against the new method. After six years' patient work he submitted his invention to the Society for the Encouragement of National Industries. He called his process 'Gravure Paneeconographique,' a name still in use at Messrs. Gillot's at the present day."

Gillot encountered, as is usual, an amount of professional opposition—the French engravers were averse to helping the new method by any encouragement, dreading that the new process would supersede their own art. Publishers also spoke disparagingly of it as 'The Process,' and, in consequence of the disrespect with which the term was then associated, M. Gillot adopted the title of Gillottage for his work. It was M. Phillipon, of the *Journal Amusant*, who came first to his assistance, and, foreseeing the value of the process, gave up all wood-engraving and used Gillot blocks instead. M. Gillot was greatly assisted by his wife, who was a good artist herself. M. Gillot died in 1872, after having invented and perfected one of the most important inventions of the century, and founding the first and most important process establishment in Paris.

The earliest public recognition of its value was at the Exhibition of 1855, when the distinction of Honourable Mention was conferred upon the process.

My father had for many years been experimenting with photography on zinc, but it was not until after many years of labour that he succeeded in perfecting his process sufficiently to practically work it, and then only by adopting the Gillot method of etching. It may be interesting to mention that the first etcher who came from Gillot, of Paris, to introduce the method into England, in 1876, is still working for me.

It is curious to note that, although forty years have passed since Gillot invented line zinc etching, the method has not much improved. His

method was perfect, and the results obtained then were equal to those of the present day. (I am referring to pen-and-ink or line work.)

It must not be forgotten that all the early plates were either drawn on zinc, or on transfer paper, or lithographic stones, and then transferred to zinc and etched. It was not till later that the method of photographing direct on to the zinc was adopted. It was my father who at that time was endeavouring to photograph direct on to zinc, and his process, by those who were capable of judging, was considered the finest ever introduced. Mr. Comyns Carr, in a lecture before this Society, referred to it specially and described it; but a certain amount of patience was required to get any decent results. In the early days I had to do all the practical work, to take the negative, print it, and prepare it ready for etching. The difficulty was in obtaining the result on zinc—the only methods then in use were either by albumen or bitumen, neither of them perfect if you desired to obtain delicate results. Another method, employed previously to this, was to prepare albumenised sensitised paper, to print the same and ink it up, and then to treat the print as a transfer by transferring it on to the zinc in the same manner as a lithograph. My father's process was in the form of a sensitised carbon paper, which was printed and then squeegeed without pressure on the zinc, thereby retaining all the fine lines, and not smashing them, as was the case with the earlier transfer method. After the carbon was developed, the plate had to be carefully etched and then rolled up. It was here that the difficulty arose. A certain knack was required to ink the plate, owing to the plate 'tinting,' i.e., the white parts inking up as well as the picture, and to such an extent that one could not remove the blemish without damaging the work. I found a solution (nut gall) which helped me greatly in getting rid of this tint; but, although I tried to teach a good many, I only came across one man who had the knack of doing it. This process was worked for some years, until, with the advent of improvements and the increased output of blocks, I dropped it.

When Klic was last in England (about the year 1883) I assisted him in experimenting in the reproduction of half-tone engraving. Meisenbach was just then coming to the front, and Klic had some scheme of making cross-line screens. His idea was to make these screens photographically by photographing a single lined negative both ways, and reflecting the light through the lined negative in such a manner as to secure a sort of halation, or softness, between the points that the lines cross. Dry plates were used at that time, and, instead of using daylight or electric light, a very strong bull's-eye lantern and a rapid dry plate were used. Although a lot of experiments were made, nothing came of them. I am afraid I had not much faith in the process, and was not really enthusiastic over it. My father and myself experimented on making different screens. We had one idea of making a sort of chess-board screen consisting of black and white squares, and for this purpose we got an artist to make the board, and for six months he worked on this wretched inartistic mechanical work, nearly blinding himself, as the board had to be reduced so very much, the results were too small to be practically useful.

At that time wire gauze was used, also lace and silk. Some fine results were obtainable through the wire gauze, but the scientific principle and method of breaking up the dots had not been discovered. It was Mr. Ives who first went thoroughly into the matter, and whose researches and experiments have proved of great value to the trade. There have been a good many processes which would have proved useful had they been workable commercially, but, when an inventor brings you a new process and shows you the result, he does not tell you how long he has been preparing the specimens, and how long it has taken him to perfect the one he shows you—all he knows is that theoretically it can be done in, say, two days, not telling you that it took him perhaps a month to obtain the result he is showing you. My father had an idea of making half-tone reproductions without the aid of screen or grain, and certainly he did succeed in getting examples on stone which were simply marvellous. Had the process been workable, it would have revolutionised lithography, for he obtained delicate half-tones from the stone. His method was briefly as follows: He prepared a carbon paper upon which the picture was exposed under a negative, the paper was transferred to the stone, not with pressure, but simply by squeegeeing it. After the print was soaked, the paper was taken off, the carbon was left on the stone and developed, we then had a beautiful photographic print on the stone. This was dried and then slightly etched with nitric acid, after which the carbon picture was washed off and the stone was treated in the ordinary way—that is, inked up—and the effect of the process was that all the half-tones were retained. Messrs. Maclure & Macdonald had one of these stones, and tried it on their machine, and had no difficulty in printing from it, as the more they printed the better the picture became, because, owing to the porous nature of the stone and the action of the carbon tissue, the picture had sunk right into it. But it was impossible to work this process; it was the most erratic process ever invented. The specimens I referred to took about twelve months to prepare—that is to say, about forty had to be made before we got a good one. But it was the first and only process ever invented that enabled a pure half-tone to be printed direct from the stone. The process was a secret one, and my father and I were the only ones ever to work it. There have been various processes, such as heliotype, phototype, collotype, &c., but all these were printed from gelatine films or moulds.

There was a very curious process at this period which I saw worked, and that was to get a reproduction either enlarged or reduced from existing pictures on stone or wood. You had a large piece of smooth indiarubber stretched in a frame, which you contracted or stretched, according to whether you wanted it reduced or enlarged, and some very good results were shown. The process was amusing, inasmuch as you could distort a picture to any extent you liked, and with portraits you could get the most comical effects. Those comical indiarubber faces that children play with, or one of these distorted mirrors, will give you some idea of its comicality.

Pretsch blocks were really the first half-tone grain blocks. Pretsch discovered that the bichromated gelatine film possessed the property of reticulating itself with minute vermicular markings, when it is wetted after the usual exposure to light. This is specially noted when the film has been rapidly dried, and when it contains a portion of chloride of calcium; the reticulation varies according to the heat at which it is dried, according to the exposure, and to the light and shadows of the picture. The one fault with this process is that the grain may become unduly prominent and so destroy all fine detail.

The Pretsch process was developed by Swan, who obtained the gelatine relief with carbon tissue, thus avoiding irregular swelling and granulation of the gelatine, and afterwards by Geymet, Roussillon, and Dawson among others. General Waterhouse in 1880 used fine sand sifted in the gelatine relief on a copper plate while it is still soft.

Messrs. Sprague's process must be mentioned as being based on the reticulated gelatine grain principle. They have used this process very successfully in connexion with supplements for various papers and insets, most of their reproductions being printed from stone, the type-high blocks not being so successful as those results from stone. They call their method the Ink Photo Process.

Although several attempts have been made to introduce grained half-toned blocks, the result has not been successful, because they lack depth and have not the softness of the ordinary half-tone block. The finest results, so far, have been done in France, by Goupil, but then they have had the advantage of exceptional printing.

Amongst other processes was one called the silver-line process. It is a very pretty process, and a Frenchman I knew in the eighties induced several publishers, to their loss, to work it. One well-known publisher in those days, who dabbled in process, always considered his downfall due to the money he had sunk in endeavouring to bring this process to a successful commercial issue. The silver-line process was to coat a zinc plate with bitumen, expose it under a positive, so that, after developing, the plate was etched slightly, and a metallic alloy capable of resisting the acid deposited on the lines. The process, owing to its pretty appearance, charmed good many, but it also proved costly.

Another inventor tried to make use of glass as a substitute for zinc in the preparation of surface blocks by the etching method. Hydro-fluoric acid instead of nitric acid was used. It was proposed to use it for large pictures for illustrated newspapers, and to some extent this was carried out in a paper published in Australia, but I cannot find any facts relating to this. I only mention it as a curious experiment. In endeavouring to give a brief report of process engraving I find the records on process are really very meagre. This is owing to the fact that an endeavour was made to keep most of the processes secret. Although a good many processes have since come into existence, the differences between many of them are very slight, many being merely variations on some small point.

Another process in use in the early days was the gelatine process. This consists in printing the picture on a sensitised film of gelatine; if this gelatine is soaked in water, the parts representing the whites swell, and the darks, really the picture, remain as they were, as the light has rendered them insensible to water; from this swelled gelatine mould a cast is made and electrotyped. The process is used only, I believe, by one firm, Messrs. Dawson. Some of the results obtained are very good, but I am afraid nowadays the process is looked upon as old-fashioned.

Messrs. Dawson also worked another process, by which some very excellent results have been made, and it has held the field for a considerable time for special classes of bookwork, but, of course, for rapid periodical work it was not suitable. They called this process typographic etching. This process differs from all others. It has less of a mechanical nature than the modern process, and it depends upon the skill of the draughtsman who works it. The design is drawn with an etching needle on a metal plate covered with wax; the metal is therefore bared at the lines, which are separated by ridges and spaces of wax. For outline work the process is admirable; elaborate drawings can also be made, and they are best made by the artist himself who is familiar with the etching needle, but artists are slow to adopt any little training which would have made them proficient in sketching on the prepared surface. In referring to this excellent process, one is reminded of the process called the Glyphographic process, invented by Edward Palmer about 1842. There is no special interest attached to Palmer's process beyond an earnest and unsuccessful attempt to supersede wood-engraving. The process never came into practical use. It ruined its inventor, who gave up a good business as an optician and found himself in the Bankruptcy Court, not an unusual proceeding for inventors who have tried to bring process

engraving to a successful issue. Your true inventor seems essentially drawn towards the Bankruptcy Court, and has hardly ever derived any benefits from his inventions; it has generally been some smart business man who has taken up an old idea, improved it, and gained the credit and kudos which really never belonged to him.

Amongst the processes which were a good deal advertised, but came to nothing, was the Sutton process. A syndicate was formed to run this process, and a demonstration, including a luncheon, took place for the benefit of the press, who, not having a practical knowledge of process work in general, gave glowing accounts of it. It was demonstrated that blocks could be made in less than half an hour, but what was obtained was only a gelatine dry plate cast from which an electro had to be made. The results were by no means good, and the syndicate, after working it for some time, disappeared quietly, in the usual manner of unpractical syndicates.

Mr. Woodbury also attempted to make type blocks from his reliefs. His process—Woodburytype—although in much demand at one time was only adapted for supplements and insets, as the prints were from intaglio gelatine moulds and not adapted for type work. Mr. Woodbury made his block by breaking up a transfer taken from his mould and transferring it on to zinc to be etched.

Mr. Ives, in 1878, patented a process. His plan was to take an inked Woodbury relief and to press it against a grained or embossed paper, the picture on the grained paper was then copied in the camera or transferred to zinc direct. In another improvement of his he took a cast in plaster from the Woodburytype; on the plaster cast he printed lines or stipples by means of an indiarubber stamp. By flowing the plaster over with collodion he was able to transfer the ink to the resetting film, and after slipping the film off he made a print from it on the plate.

Some thirty-four years ago the Graphotype process was in use for a short time and, although to a certain degree ingenious and original, it was not found sufficiently practical. Briefly the process was as follows:—The drawing was made in an ink consisting of glue and lampblack upon a block prepared by compressing precipitated chalk into a solid cake. When the drawing was completed, the whites between the lines were brushed out, the block was treated with silicate of potash to harden it, and electrotyped.

In commenting upon what we may call the chalk block period, my father, August Hentschel, worked a similar process, with the difference that he used photography in connexion with it. His was a mechanical process—the drawing, which had to be in line, was photographed on to cardboard, which was coated with a thick solution of caseine, plaster, and other ingredients sensitised with bichromate; this was placed between a roller to take off any unevenness, and then exposed under the negative. It was then developed, and the parts unexposed were washed away, leaving the picture in relief—this was dried, an electrotype was taken, and the large white spaces were deepened by the aid of an engraver. Now, this process was a pure mechanical process, as it gave an absolute facsimile result of the artist's own drawing, which the other chalk process did not give, and some very good results were obtained, but at that period publishers were not so sympathetic in adopting any new process.

PAST AND PRESENT.

It is interesting to look back upon those early days and compare our present methods. I can well remember a time when, if a block was turned out in a week, it was thought something wonderful; afterwards, when I succeeded in turning out a block in twenty-four hours, it was specially noticed in the Press, and, when a double-page pencil drawing by Melton Prior for the *Illustrated London News* was reproduced in nine hours, the fact was regarded as marvellous. Nowadays half-tone blocks are wanted in two to four hours, and line blocks in two hours. It is nothing unusual to have to deliver a double-page block from a wash drawing in six hours, and in some cases we are expected to make the blocks in less than that. There is no doubt we are arriving at a time when it will be almost possible to supply blocks whilst you wait. From an artistic point of view this is to be deplored, but we live in an age of nervous rush, and one must go the pace or be left behind; it is the pace that kills the workman as well as his art, for certainly no one can put his best work into a block when only minutes are allowed for a difficult process requiring hours. I can call to mind in 1879 having some very difficult old engravings to reproduce; they were for a book on *Marie Antoinette*, by Lord Ronald Gower, and it took the best part of a year to do what now could be done in a week. It is not a question of getting it right there and then; oh, no, it was a case of doing it over and over again! You can imagine the monotony of redoing the same picture until it was perfect. A portrait of Cetewayo which I was doing then is so vividly impressed upon my memory that to this day I seem to see every line in it. I had to do that wretched portrait about fifty times before I could get it right. It is no wonder, then, that the Company which worked this process in its early days came to an untimely end. (The title of the Company, by the way, was The Direct Photo, Litho, and Metallo Gravé Printing Company, Limited.) Another thing to be considered was that in those days every one was prejudiced against process or zincography, as it was then called; wood-engravers were up in arms against it, printers said it could not be printed—(printers always do

ay that). I have found that printers are really the most conservative of conservatives, and will not touch anything new unless forced to do so. Zincs were then not so deeply etched, and required more delicate handling than woodcut, and when Meisenbach blocks came into existence the printers had, much against the grain, to change their method of printing. Soft backing and heavy blankets and rough paper would not do, and the early results of Meisenbach blocks were really heart-rending; but, luckily, the proprietors of the *Graphic*, the *Illustrated London News*, and *Lady's Pictorial* saw the value of this process, and assisted in improving the printing, and printing has steadily gone on improving.

Being on the subject of printing, I may just refer to the process blocks made for the *Daily Chronicle* some five years ago. It was due to Mr. J. Pennell's energy and enthusiasm that the *Daily Chronicle* went in largely and extensively for line drawings, and all by the best artists of the day. The results were exceptionally good, and a good many wondered how it was that they printed so well, keeping all the delicate lines and quality. The fact was that they had adopted a method I suggested, namely, that of using original blocks for every one of their machines, and bending and fixing them on the cylinder. There was a little prejudice in adopting his method at first, but when it was tried the results were perfect and have never been equalled. Unfortunately, time not always permitting his for their occasional illustrations now, they stereotype them, and the result is nothing like so good.

One always hears that they hurry along things in America. Well, from my own experience, blocks have to be produced in much shorter time here than in America; for instance, as a record of quickness, I may mention that over thirty square feet of line blocks had to be, and were, delivered within nine hours, and on that same day my firm had to turn out in all seventy square feet of blocks in twenty-four hours, and, in spite of this rush, the blocks were all perfect. The blocks included those large page illustrations that appear in the *Daily Chronicle*. These page illustrations were, by the way, the largest zinc blocks that had ever appeared in any newspaper. To realise this quantity of work, you must consider how many wood-engravers would have been required, and how long it would have taken them to engrave seventy square feet of blocks.

Meisenbach must be credited as the inventor and pioneer of the half-tone process. He patented this process in 1882. The effect was that wash drawings, oil paintings, water-colour drawings, in fact, anything that could be photographed, could be reproduced direct without having recourse to redrawing it in pen and ink or engraving on wood. It is this process which has killed wood-engraving all over the world. The important feature of the process was the use of a finely ruled glass screen, which was interposed in the camera between the original and the negative, the effect being to break up all the gradations and half-tones into different sized blacks and cross lines. In the early days Meisenbach used single lines for these, and by shifting the same in the camera obtained these dots and cross lines.

Mr. Ives really improved upon the Meisenbach method, for, whereas Meisenbach used a single line screen, and withdrew the line screen during exposure, and replaced it instantly in a transverse position, producing thereby a cross-line effect, Ives obviated this turning operation by putting two of his machine-ruled screens together, face to face, and sealing them. The diamond-ruled screen of to-day is practically the same as Ives's early invention, although Max Levy improved upon it by producing it on his improved engraving machine.

Many other experimenters stumbled over similar experimental results, but it was not until Dr. Eder wrote his treatise on the "Formation of the Dot in Half-tone," and was followed by contributions from Count Turatti, E. Deville, Max Levy, Ives, and others, that the theory and principle of what Ives called the optical V were made generally public.

The enamel process, which was discovered by an American named Purbeck, greatly assisted in improving process work.

Amongst the processes for the purpose of converting photographs into half-tone blocks may be mentioned the Luxotype process of Brown, Barnes, and Bell, in which no screen was used, but the part to be copied was embossed by the aid of a wire gauze and plate by rolling or pressure, and this embossed print was strongly side-lighted. The results were not satisfactory—whether the process was ever worked commercially with success I don't know.

Another method of making a grained negative without a screen was suggested by Messrs. Krantz and Zeisler. An image of the subject was projected lantern fashion on a white screen, ruled with black lines, and the composite subject photographed. In using a gauze or ordinary line screen the tendency was to get a monotonous flatness, and the effect had to be obtained by what is called fine etching—a method by which the original artistic drawing was often etched away beyond recognition, for, since the detail of the original had to be put in, everything depended upon the artistic skill of the etcher. It was owing to this amount of fine etching required and the flat result obtained that process blocks in the early days got such a bad reputation from artists.

HAND ENGRAVING.

This is a point upon which a good many people differ, but there is no doubt that a good engraver may considerably improve a block. Unfortunately, however, publishers want their blocks done at so much a square inch, and will not pay for extra work. If only editors and

publishers would realise that it would pay to spend a little more money on their engravings. I do not say anything about weekly periodicals, because there it is a question of time; but it is gratifying to see that the *Graphic*, whenever possible, spend a certain time in hand engraving the blocks. Wood-engravers are now turning their attention to process work, and with their artistic skill ought to be able to improve and work up process blocks. To what extent this can be done one has only to scan the American periodicals. But, if a good wood-engraver has not had the proper training for engraving on a process block, then he had better leave it alone. To engrave a process block well requires proper training. The point to consider is whether the older wood engravers will take the trouble to learn it, or whether a new school of engravers on process blocks will arise.

The *Century Magazine* shows the finest examples of this class of work, and what I am glad to see is that they acknowledge the wood-engraver's name under each block.

It was about 1883—the advent of the Meisenbach process—that things got a little forwarder. Meisenbach fairly revolutionised process engraving. It was the advent of the American screen and the beautiful results obtained in America that caused a rush of process firms to be started in England. The firm to show the lead in using the Levy screens and producing the finest work at the time was Andre & Sleigh, and, certainly, for some years they held a good lead, but, with the screens and improvements from America becoming universally known, good work was done by several firms. Meisenbach gave up their old screen and took up the Levy screen as well, so that after a time it became a survival of the fittest, and it is curious to note that, in spite of competition, the old firms such as Meisenbach, Swain, and Hentschel, all established since 1887, have held the lead for turning out good work.

Amongst firms who must be mentioned as doing fine work are the Swan Engraving Company, Ward & Co. (who both had the advantage of Mr. Ives's personal experience), the Art Reproduction Company, whose workmen first came from Angerer & Goesshl, the well-known Vienna firm. It may be interesting at this point to give you some idea of the progress of process, and the decline of wood, engraving as shown in the London Directory:—

	1876	1879	1884	1887	1895	1900
Wood-engraving.....	—	130	162	158	131	80
Process.....	1	2	6	14	53	56

The first process firm in England was Leitch & Co., and the firm was started by the proprietors of Kelly directories; the business was eventually taken over by the late John Swain, the wood-engraver who foresaw the future of process. The second firm was Cattell & Co., which consisted of some of the original employés of Leitch & Co.

Out of the fourteen firms in existence in 1887 there are only five at the present moment existing, and out of the fifty-three firms who were doing business in 1895 twenty-two have gracefully retired. It is interesting to view the figures and notice the increase of process engraving since 1879 to 1900; but, although there was a great rush between 1887–1895 to enter and swell the ranks of process men, the last few years has shown a steady decline. Competition and cutting prices has been the ruin of those firms who rushed into business on insufficient capital and with little experience.

Wood-engraving has not been able to compete against the rapid strides process has made. Mechanical processes, which have been the outcome of photography, have educated the public eye to a more delicate, more minute style of work; the public taste has been influenced by photography; the simple outlines which were once accepted as satisfactory now no longer suffice, and it is, perhaps, unfortunate, from an artistic point of view, that the public have taken so much to photographs, to the detriment of the artist, for, although photography is excellent, it could be made so much more artistic in conjunction with an artist using his artistic feeling to embellish and improve the picture.

The precise style of illustration that may be fashionable at any time will be partly a matter of taste, partly dependent on the means at the command of the artist and the process in vogue. At the present day the artist has not to restrict himself to the extent he did in the early days as to how he should draw for process. My own feeling in the matter is that artists should be allowed to draw and use what material they like; it is the business of the engraver to invent a process which will reproduce the artistic effect of the artist. The rapid strides that process, and especially half-tone process, has made enables us to reproduce any drawing, no matter how drawn, whether in wash, pencil, or any other material. When process first came into use, every artist had to draw only in line or grain; no half-tint or tints were permissible, and he had to use black ink or brown ink and white paper. There is no doubt the restrictions placed upon artists by the photo-engraver seriously hampered the artist, and helped to render his drawing mechanical. Very few artists seem to grasp the idea of drawing with that crispness necessary for a line process block. How often have I been handed a drawing on yellow paper drawn in blue ink, and have been expected to obtain a satisfactory result; and how often the lines were drawn so faintly that it was necessary to force them up to make any block. What was the result? All the feeling was gone, and the process engraver was condemned as usual with, "What can you expect from a process block?"

But, after all that one may say against process—and a lot of hard things have been said about it, and especially by artists, who have forgotten that the very advent of process has been the means of creating more work—let us only consider for one moment whether so many illustrated periodicals, books, or newspapers could be published now had it not been for the aid process has given to the publishers in enabling them to place before the public what was an impossibility in the days of wood-engraving. Process is not perfect yet by any means, but its progress is by no means at an end, and one conspicuous advantage it has over wood-engraving is that the actual work of the artist is more faithfully reproduced than by the wood-engraver. You may retort, "Yes; but not so artistically, because your wood-engraver was an artist, and your process engraver is a machine." Suppose we grant this; but the process engraver, although a machine, endeavours to throw all the artistic skill possible into his work. If, owing to the rush of the present day, he cannot do this to every block, he should not be blamed for that, but the publisher, and especially the public, should be blamed, for all they seem to want is cheapness—cheapness and rapidity. If you offer a publisher better work, he often replies, "Oh, I know the work is much better, but the other is good enough for the public!"

The impetus process has given to illustrated journalism one can only realise after examining the illustrated periodicals for the last seventeen years; the progress has simply been marvellous, and the subject is so large and so interesting a one that it would take hours to enumerate or even give the briefest history of it. For instance, about 1883 there were only four sixpenny weekly papers, using about eighty blocks, nearly all wood-engravings; now there are about fourteen sixpenny papers using some 1000 process blocks every week.

PRINTING.

This is always a sore point; the process engraver always gets blamed for his block if the result is bad. "Oh, it's the block, the printing is all right." Although England has made rapid strides in its printing, it is still far behind America, and why this should be I cannot understand. Printers will not understand that a printing room should be kept as clean and as evenly heated as a studio—but what do we find? The machine room is generally somewhere in the basement, but that would not matter if the surroundings were kept as they should be, and an even temperature kept up; now, an even and warm temperature is one of the main secrets of good printing, and yet how little attention is given to it. The fact is the whole question of blocks, ink, printing, and paper, is not sufficiently studied together; one man orders the ink, one the paper, one sees to the printing, and another to the blocks, but there is rarely a capable practical person who will see that the co-operation is secured which is necessary toward getting the best result. It is a case of each one for his own department, instead of working together. England has good artists, can supply blocks superior to any abroad, and England should be in a position to compare favourably with America. Let the printers give their attention to this, and the day may come when America may learn something from England. Whatever credit the English illustrated press may claim for the progress it has made, I think process has had a good deal to do in furthering this success.

CARL HENTSCHEL.

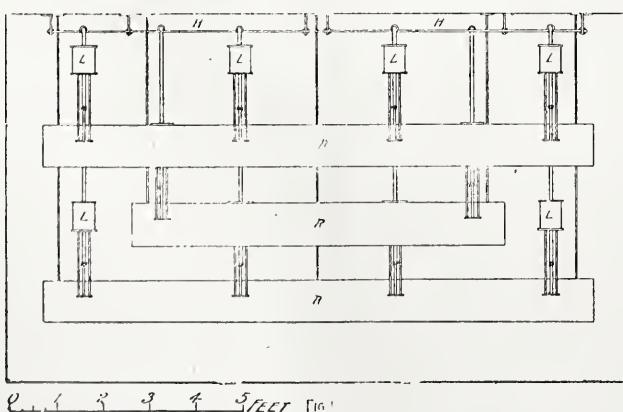
MORGAN'S ELECTRIC LIGHT APPARATUS.

[Patent No. 5514 of 1899.]

Fig. 1 is a front elevation, with the wooden or other framework removed, and showing the arrangement of the lamps of a ten-arc installation, with the movable reflectors and diffusers.

Fig. 2 is a section on end, showing the position or probable angle of lighting.

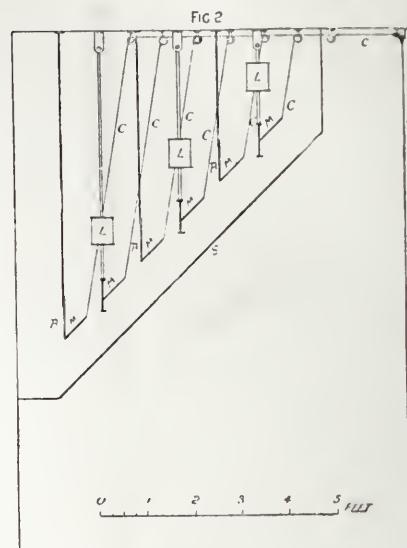
Fig. 3 is a plan, showing the arrangement and method of



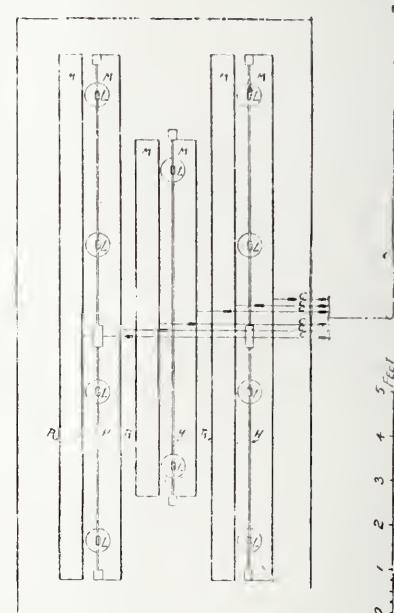
manipulating the cords for moving the reflectors and semi-transparent mediums.

Fig. 4 is an elevation, showing the wooden or other framework for holding in place the ground glass or other semi-transparent screen.

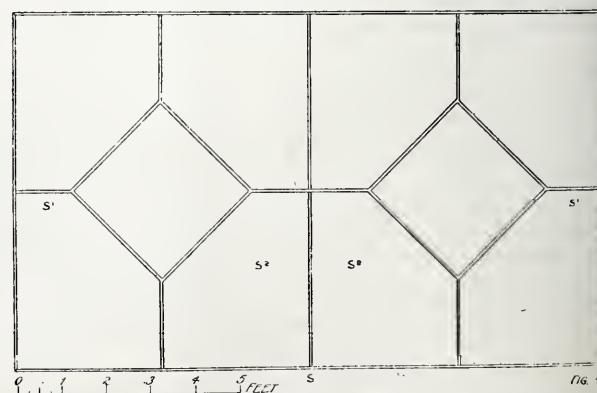
II (fig. 1) is a rod or rods, from which the arc lamps are suspended. L L are the arc lamps, which work in series or otherwise, R R are the movable reflectors, for assisting in diffusing the light from the arcs. L L (fig. 2) are the arc lamps, R R are the movable reflectors, M M are the



mediums of semi-transparent material for partially intercepting, breaking up, and diffusing the direct rays from the arc lamps. These latter are placed in such a position in front of the arcs that they may be used as interceptors and diffusers, or dropped by means of the cords, c



below the level of the arcs, when the operator is requiring a more concentrated light. S is a semi-transparent screen, placed at any desired angle, in front of the arrangement of arc lamps, reflectors, and diffusers, and assists in further breaking up, and distributing or diffusing,



the light coming from the arc lamps, as well as conceals from observation all the mechanical parts. H H (fig. 3) are the hangers for the arc lamps, L L are the arc lamps, R R are the reflectors, M M are the

already referred to, and c shows the cords and arrangement of the same, whereby the mediums may be raised into, or lowered out of position as desired. Fig. 4 (s) is a screen, the framework of which may be made of wood, iron, or other material. It may be divided into any required number of spaces by astragals, s¹, into which is fitted ground glass or other semi-transparent material. The screen, s, is placed in front of the arc-lamps, reflectors, and diffusers as already described, s² s² are the movable panes for giving access to replace carbons, etc.

MORTON'S LANTERN SCREENS.

[Patent No. 9005 of 1899.]

THE invention consists of having a sheet of cloth stretched tightly and securely held between two sheets of glass, mica, or other transparent material. If, however, it is desired, for economical or other reasons, the cloth may be fixed to a plate of glass and varnished.

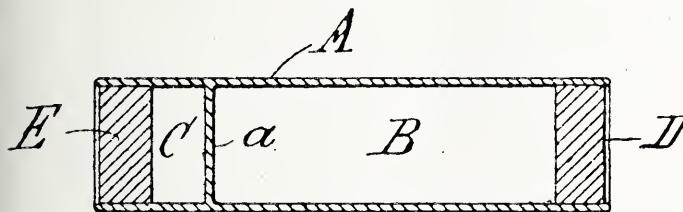
GRIFFIN'S SYSTEM OF PACKING PHOTOGRAPHIC CHEMICALS.

[Patent No. 12,337 of 1899.]

THIS relates to the method of storing or packing and dispensing measured quantities of chloride of gold in the shape of crystals or powder as a toning substance for photographic purposes, but is applicable also to other photographic chemicals used in minute quantities.

The quantity of gold chloride necessary for a toning bath is so small that the correct measurement by means of the ordinary appliances at the disposal of a retail dealer or photographer presents some difficulty.

In order to avoid this defect, Messrs. Griffin dilute a conveniently large quantity of the toning substance, preferably a multiple of that required for a toning bath, with a suitable quantity of chlorate of potash or other innocuous substance, the two ingredients being uniformly incorporated with each other, so that a given quantity of the mixture contains a known



and constant quantity of the toning substance, which mixture is then measured off and packed in doses suitable for a toning bath.

They also provide a special glass tube large enough to hold the quantity of photographic chemicals or mixtures necessary for a toning or a developing bath, the said tube being open at both ends and provided with a transverse partition between the same, or two tubes being joined and fixed together end to end, so as to form two compartments for the chemicals or powders which are to be used for a developing or toning bath, or other photographic bath, for instance, one compartment for chloride of gold and the other for alkali. Each compartment, after having been charged with the required quantity of chemical or mixture, is closed with a cork and hermetically sealed with wax or by other suitable means. In this manner the two chemicals are kept separate, and prevented from decomposition until required for use.

In the accompanying drawing A represents a glass tube embodying the invention. The tube has a glass partition, α, made integral with the tube, so as to divide it into two compartments, B and C, which are filled with the required chemicals or mixtures, and then closed with stoppers, D and E.

SCHMIEDER'S METHOD OF PRODUCING PHOTO-LITHOGRAPHIC PRINTING SURFACES.

[Patent No. 24,934 of 1899.]

THE surface is first roughened or grained, preferably by means of very fine sand blast, in order to obtain a uniform fine grain; it is then carefully dusted and washed with a weak solution of nitric acid. The stone or plate is now warmed, and its surface coated with a weak solution of isinglass or other suitable gelatinous substance, which coating is allowed to dry in a temperature of about 100° F.

A solution consisting of

2000 weight units of distilled water,
20 " " albumen, and
10 " " saccharic acid,

is thereupon applied to the coated surface by means of a fine brush, and allowed to dry.

Of two other solutions, one consisting of

1000 weight units of distilled water,
50 " " chloride of zinc, and
2 " " chrysanthine,

the other consisting of

500 weight units of distilled water,
15 " " bichromate of ammonium, and
7 " " bichromate of potassium,

equal quantities are mixed, and some of the mixture is poured over the prepared surface. The plate or stone is then placed in an upright position to allow the superfluous liquid to drain off.

When the film is thoroughly dry, the photographic negative is placed upon it and the exposure is made. With a good light of normal intensity, from ten to fifteen minutes will be required for completing the exposure.

The surface is then rolled with a specially prepared ink applied to a stiff roller. The said ink comprises the following ingredients: suitable proportions of lampblack, wax, Venetian turpentine, lithographic ink, and a few drops of oil of lavender are melted together, well mixed, and ground up with small quantities of finely powdered asphaltum, colophony, or resin, and pure beef fat.

The picture is thereupon developed by lightly passing over it a sponge saturated with water until the picture shows clearly, when the surface is carefully cleaned and covered with a coating of dissolved gum arabic for the purpose of protecting it from impurities and dust.

The gum arabic is subsequently washed off, and the ink is removed by the aid of turpentine, whereupon the surface is washed with dilute nitric acid in order to decompose the sensitive film. The surface is then, while being kept wet with a weak salt-water solution, rolled up with strong ink until the picture shows well, and any necessary retouching may now be performed in lithographic ink, or the like.

Finally the surface is subjected to the known acid treatment as usual with lithographic chalk drawings, and the stone or plate is then ready for the ordinary lithographic printing process.

It will be observed that the picture is now on the stone or metal surface itself, the sensitive film or coating having been destroyed by the decomposing process, as described, after having served to receive the impression of the photographic negative.

One stone or plate is sufficient for producing a perfect monotone in several depths of tone, gradually blending with each other, from negatives taken from nature, or from Indian ink, wash, or other drawings, etchings, and like originals, with all and every detail and graduation of light effects, while three, or at most four, stones or plates will be required for reproducing originals in colours.

THE NATIONAL PHOTOGRAPHIC EXHIBITION.

AMONGST the firms having stands at this Exhibition, which will be open from April 27 to May 5, are the following: Messrs. H. Purser, C. P. Goerz, Thornton-Pickard Manufacturing Company, Butcher & Son, Houghton & Son, Benetfink & Co., O. Sichel & Co., Wm. Tylar, J. J. Griffin & Sons, L. Gaumont & Co., Marion & Co., Moult Brothers, J. F. Shew & Co., J. Lazarus, Columbia Optical and Camera Company, Morgan & Kidd, Secco Films (Limited), The Tella Camera Company, Photochromoscope Syndicate, Wallis Brothers, The Warwick Trading Company, W. H. Assender & Co., Frederick Boehm, David Allan, Lancaster & Son, Harrington & Co., R. W. Thomas & Co., Seabrook Brothers, Prestwich Manufacturing Company, The Camera Construction Company, Thornton Film Company, Lambert Matthews, Bean & Ringwood, Illingworth & Co., Rogers & Webster.

Our Editorial Table.

MR W. D. WELFORD, of 166, Romford-road, E., sends us a sample of his new "Professional" vignette. It is made throughout by photography, and consists of three films bound together. They are only bound at the edges, which allows of a slight separation of the films, thus adding to the softness of the result. As this vignette is being made entirely for professional photographers, Mr. Welford has decided only to supply it direct to the user. The prices are: $\frac{1}{4}$ -plate, 1s.; $\frac{1}{2}$ -plate, 1s. 6d.; whole-plate, 2s. 6d.; either oval or pear-shaped opening may be had.

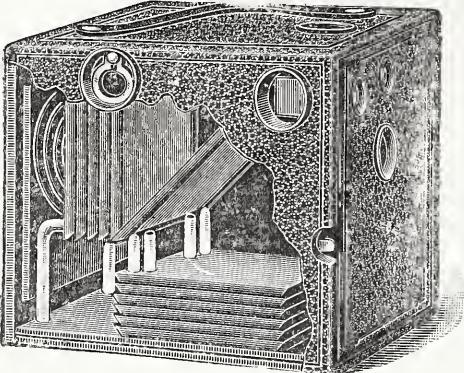
THE CYKO HAND CAMERAS.

Manufactured and sold by John J. Griffin & Sons, 20-26, Sardinia street, Lincoln's Inn-fields, London, W.C.

In a note we have received from them, Messrs. Griffin tell us that their idea in introducing these instruments is the following: There is still a very large public, viz., mechanics, clerks, and the lower middle class who

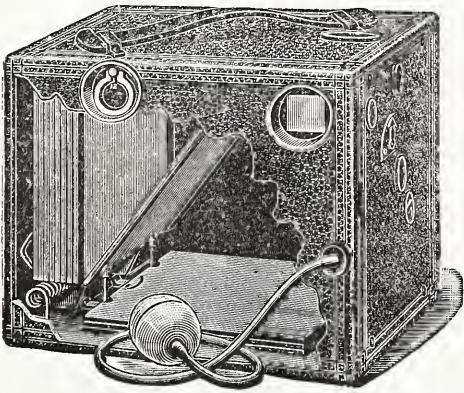
are practically untouched by photography. The Cyko cameras are introduced with a view of meeting the need of this public for a reliable and practical instrument, attractively finished, and capable of producing entirely satisfactory photographs at a price, within the reach of the class referred to.

These "forewords," if we may so term them, constrained us to look for a simple form of hand camera, easily worked, and sure and certain in its mechanical movements. In the expectation that we thus formed we were not disappointed. The Cyko is so simple that a child could successfully manipulate it after five minutes' instruction. The No. 4, which we tried, is covered with black leather, is light, portable, and



neat in appearance. It takes twelve sheaths, which easily fall into position, are securely held, and, when an exposure is made, a sheath is released and dropped by the simple action of turning a small nickel ring on the outside of the camera. We submitted this movement to repeated practical trial, and for a camera of the kind we could not expect a changing action to work with greater satisfaction and smoothness. The remaining features of the Cyko camera are thus described:—

The lens is an achromatic, combination meniscus. The shutter is very simple of construction. It is always set, requiring but a touch to make the exposure, automatically resetting itself without further effort. When one has made twelve exposures, one has only to open the camera at the



back and draw out the tray carrying the twelve plates, which are removed by merely lifting them off.

The bulb release prevents possible jarring of the camera, a register shows the number of exposed plates, the plate-holders are made of aluminium, the diaphragms permit three different openings, with a cut-off, which, when set, locks the shutter and prevents accidental exposures. Decidedly the Cyko should be popular among the class for whom it is intended; our trials of the instrument showed us that nothing could be simpler than the three easy movements of setting and releasing the shutter and changing the plate.

Studio Gossip.

PHOTOGRAPHIC ENTERTAINMENTS.—We read that "book" and "flower" teas are giving place to the "photograph" entertainment. Each guest, instead of pinning on coat or dress decorations which represent the name of a book or flower, supplies a photograph of himself or herself taken when he or she was but a mere child. These photographs are spread out on a table, and the assembled guests endeavour to name the pictures. The hostess, of course, provides a prize for the person who identifies the largest number of photographs.

A PHOTOGRAPHER SUED FOR WAGES.—Albert Hemsall, photographic operator, of 23, Oliver-street, Nottingham, sued George Caldwell, photographer, of Kirkg-street, Nottingham, at the Nottingham Police Court, to recover the sum of 6*l.* 17*s.* 6*d.*, balance of wages due to him as a workman under contract for wages entered into by him with the defendant, his

employer. Mr. Clayton appeared for the plaintiff, and stated that the defendant was apparently in a good position, having a fairly large business in King-street, Nottingham, and lived in a large house at Lenton. The plaintiff stated that the defendant engaged him for seven weeks, as assistant operator, at a salary of 1*l.* per week, and he had only paid him 2*s.* 6*d.* The Bench made an order for the immediate payment of the amount in question.

PHOTOGRAPHIC ATTRACTIONS AT THE PARIS EXPOSITION.—The Optical Palace Section of the Paris Exposition comes in for unfavourable criticism at the hands of a correspondent, who says that, "on arriving at the Palais de l'Optique, one is ushered through the folds of a funeral-looking curtain into a pitch-dark room, a process which at first suggests initiation into the Eleusinian mysteries. Such a fate, however, does not await you. By dint of straining your eyes, you observe that a magic-lantern is being manœuvred at the end of the room, and accordingly expect something interesting to ensue; but, when the white disc on the sheet becomes filled with horrible little black splotches, which an invisible lecturer explains to be the bacilli of bubonic plague, and, when the plague bacilli are followed by their *confrères* of typhoid fever, you do wisely to retreat in sadness. It is not necessary to visit the Paris Exhibition to gaze on disease germs. Whatever may be the future surprises which the Palais de l'Optique has in store for us, it cannot be said that its programme yet includes anything of a very original nature. There are some rather attractive projections of lunar landscapes, and others of submarine life; but, with these exceptions, the various side shows are somewhat insipid, and in one or two cases the reverse of decent. The much-talked-of telescope, which is said to bring the moon within the distance of a single metre, is the hit of the section, and, when this is at the disposal of visitors, the unfavourable impression created by the other exhibits may perhaps be counterbalanced."

THE METHODS OF AMERICAN PROFESSIONALS.—An American contemporary tells us that Sarony and Aime Dupont, of New York, were great portrait photographers because they understood the effect of distance. They knew how to pose subjects, so as to bring out the desirable elements and to conceal or repress those that are undesirable. Dupont once illustrated this to a class of amateurs in his Fifth-avenue studio. A stout and a skinny woman were placed side by side about fifteen feet from the camera, their right arms bared to the shoulder, the one looking like a match and the other like an Indian club by comparison. The first exposure was made to reproduce this contrast. In the second picture the women were placed face to face, or just enough so to bring the skinny arm nearest to the camera and the fat arm furthest from it. The difference in distance was the width of the women's bodies, say, about sixteen inches. The result was amazing to the amateurs, the skinny arm being enlarged and the fat one reduced, until both appeared to be perfectly proportioned. Sarony allowed a conceited fellow to pose himself. He threw out his chest, sprung his shoulders back until the blades touched, stiffened his neck, clinched his teeth, gave his eyes a cold stare, pinned his left arm to his body, and stuck his right thumb between the buttons of his Prince Albert coat, leaving the greater part of his rather small and well-shaped hand spread across his ample paunch. Unquestionably he presented an excellent figure to gaze upon in the original, but, when a single sample photograph was printed, his hand was as big as a ham. It was so much closer to the camera than his other features that it was enlarged out of all proportion. Sarony charged a big price for the negative, and refused to print any more pictures from it.

News and Notes.

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The South London Photographic Society returned on Wednesday to their headquarters, after enjoying their Easter vacation, to hear Mr. E. A. Robins lecture on "Dekko." So ably did the lecturer manipulate the exposure and development that, together with the specimen prints exhibited, his audience were quite carried away with both paper and process.

THE THORNTON FILM COMPANY.—The Thornton Film Company have concluded arrangements with Mr. Walter D. Welford to demonstrate their new glassoline films before the photographic societies of London, the south of England, and as far north as Birmingham. Mr. Welford will be glad to hear from hon. secretaries desirous of arranging a date for this demonstration. His address is now Warwick Lodge, 168, Romford-road, London, E.

SCHOLASTIC CINEMATOGRAPHY.—The New York Public Schools will be represented at the Paris Exposition by an interesting exhibit. A number of moving pictures will be taken, showing the assembly and dismissal of pupils the school workshop in operation, the cooking class at work, kindergarten games, gymnasium scenes, and recess amusements. A hall has been set aside on the banks of the Seine to show the work.

IN A LECTURE AT UNIVERSITY COLLEGE, SHEFFIELD.—In a lecture at University College, Sheffield, on the internal structure of metals, Professor T. O. Arnold said that the startling suggestion of Dr. Sorby that metals should be regarded as crystallised igneous rocks has now been proved to be true. Lantern slides were exhibited, showing the internal architecture of pure gold and copper, and also the effect that the introduction of small quantities of bismuth had upon these metals.

THE BERLIN PHOTOGRAPHIC COMPANY.—The Berlin Photographic Company are publishing a set of photogravures of Burne-Jones's chief pictures. Following their Exhibition at the New Gallery, these were photographed at the "Grange," the residence, for so many years, of the famous artist. Only a limited edition of the work will be available, and each volume will bear the signature of Sir Philip Burne-Jones. He is to hand over all the royalties due to him to the Committee of the Burne-Jones Memorial Fund. Mr. Walter Crane has designed a cover for the album.

THE NEWCASTLE CONVENTION.—In our brief recapitulation last week of the attractive programme of papers and excursions for the Newcastle meeting of the Photographic Convention of the United Kingdom in July next, we omitted

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

to mention that by the kind invitation of Mr. W. D. Cruddas, M.P. for Newcastle, the members will visit Haughton Castle, one of the thirteenth-century Border castles, which was formerly held by ancestors of Mr. A. C. Swinburne, the poet. The members will drive to Haughton from Hexham.

MR. S. H. ASHLEY OAKES writes from the Liverpool School of Photography, 73A, Lime-street, Alvin Hall, Liverpool: "Many prominent amateurs and professional photographers have urged me to place my thirty years' experience at their disposal, so I have just opened a school of photography at the above address. My terms will be moderate, and, as the success of the scheme depends entirely on the support I get, I should be glad of the co-operation of those (either ladies or gentlemen) who may desire my services in the art-science to which I have devoted the best years of my life."

THE West Surrey Photographic Society announces, in connexion with the six lectures on the art side of photography, entitled "The Technique of Picture-making," now in course of delivery by the President, Mr. J. T. Price, that a series of competitions has been arranged in connexion with the summer out-of-doings, by which the members hope to strengthen themselves in the outdoor practice and use of photography, leaving the study of the technique of the negative to the winter sessions. The first lecture was on "The Diagonal Form of Composition in Pictures," and the first competition will be for a land or seascape. Combination printing will be allowed, the finished picture being alone the aim. The lessons to be learned are the sole objective of the series. The winning prints framed and a plate attached with particulars will remain in the Society's possession for one year and for the Exhibition, and will then be returned to the winner.

CHICHESTER CATHEDRAL presented a very photographic appearance at Easter, when some twenty members and friends of the Borough Polytechnic (including representatives from the South and West Photographic Societies) made their annual architectural excursion to that place. Every facility was readily afforded the party, both on Saturday and Monday, for photographing in any part of the Cathedral, and it goes without saying that some good work was accomplished. Several beginners, who had recently joined the Society had their first practical experience in interior photography under the friendly eye of the "older hand." Sociability and good fellowship prevailed throughout, and the inner man was admirably looked after by the genial proprietress of the Bedford Temperance Hotel, whose catering was highly praised by all. Mr. F. W. Gregg distinctly scored in his efforts to provide for the comfort of everybody.

THE FORTHCOMING ECLIPSE.—The Secretary of State for Foreign Affairs has received a despatch from Sir H. MacDonell, Her Majesty's Minister at Lisbon, containing information regarding the facilities which will be granted by the Portuguese Government to foreign astronomers visiting Portugal in May next for the purpose of viewing the total eclipse of the sun. Astronomers from abroad will be exempt from payment of the usual Customs duties on production at the Custom House, on arrival, of a certificate drawn up by the astronomical society to which they may belong. This certificate, however, should be legalised by the nearest Portuguese Consulate before starting. A Government notice has now been published in the Official Gazette, stating that the King has nominated a Royal Commission for the purpose of assisting in every way those who may come from abroad for scientific observations and for superintending astronomical arrangements generally.

THE Röntgen Society's Ordinary General Meeting will be held on Thursday, May 3, at 20, Hanover-square, at eight p.m. The following demonstrations will be given:—Professor F. R. Barrell, A new Method of Localisation, with plumb-lines or threads; Dr. Dellpratt Harris, On a form of Focus-tube designed to be Self-heating; Mr. Chisholm Williams, A new X-ray Film, Cristoid; Mr. Mackenzie Davidson will show, if possible, the Stereoscopic Fluoroscope. The following exhibits have been promised: Mr. Brown, (a) A portable eight-inch spark coil, with improved break, (b) A semi-portable fifteen-inch spark coil, with improved break, (c) A milliamperimeter, for measuring the secondary discharge of induction coils; Mr. J. H. Gardiner, Skiagrams of British reptiles, &c.; Mr. Isenthal, Jet mercury break, &c.; Dr. F. H. Low, A portable ten-inch coil, &c.; Messrs. Parsons and Eachus, A portable set, eight-inch; Mr. E. H. W. Shenton, Skiagrams—localiser couch; Mr. Wimshurst, Influence machine with vulcanite plates.

EXHIBITION OF MODERN ILLUSTRATION.—With reference to our recent paragraph on this subject, it is notified that the Board of Education have decided, at the suggestion of the Council of the Society of Arts, to hold during the autumn an Exhibition of Modern Illustration in the Victoria and Albert Museum, South Kensington. The Exhibition will consist of works in black-and-white intended for book, periodical, and newspaper illustrations, and will be confined solely to modern examples of typographical work executed since 1860. This limit covers the time during which photography has been available for reproductive purposes, and during which, consequently, the original drawings have been preserved and are available for exhibition. The Board will be assisted in the selection and arrangement of drawings by an influential Committee, with some additional members, which had already been organized by the Society of Arts. It is proposed that the Exhibition shall be opened about November 1, and remain open for four months. The drawings will have to be sent not later than October 1. Any further information will be furnished on application to the Secretary, Board of Education, South Kensington, S.W., to whom all communications on the subject should be addressed.

Commercial Intelligence.

MESSRS. SPATZ, manufacturers of photographic lenses, of 19, Rue Thiboumery, Paris, intimate that, since the establishment of the business, twelve years ago, more than 100,000 lenses have left their works.

THE following is a list of the latest Warwick and Star film subjects, produced by the Warwick Trading Company, of 4 and 5, Warwick-court, W.C.: Return of the Heroes of Ladysmith; Arrival of H.M.S. *Powerful* Naval Brigade at Portsmouth, April 11, 1900; Portsmouth Preparing to Welcome the Heroes; Arrival of H.M.S. *Powerful* at Portsmouth; Sir George White's Return from Ladysmith; The Queen's Visit to Dublin.

THE KODAK COMPANY'S FREE LESSONS IN PHOTOGRAPHY.—Kodak (Limited) announce that they have arranged to give lessons as to choosing a camera, and as to methods of developing and printing. They believe this will prove attractive to ladies and gentlemen who may be thinking of taking up amateur photography, or who may wish to understand how photographs are produced. These lessons will be entirely free of charge, and will be given at the Oxford-street branch, 115, Oxford-street, W., where a reception-room has been specially arranged on the first floor, and an instructor will be in attendance. The arrangements will be as follows: 1. For those who only require one lesson, covering all the practical work in outline, instruction will be given from 11 to 12 and 1 to 2 o'clock each day. 2. Further, a connected series of five lessons, with illustrations and demonstrations in full detail, will be given every week, one lesson each day, commencing Monday and ending Friday. These lessons will be given from 3 to 4.30 p.m. daily, and will deal with all the practical processes. The subjects each day will be as follows: Monday, Introductory, Apparatus and its Use; Tuesday, Developing and Fixing, and Demonstrations of Different Methods of Developing Rollable Films; Wednesday, Printing and Toning Solio P.O.P.; Thursday, Printing Dekko and Bromide Paper; Friday, Enlarging and Lantern Slides.

THE metric system and its cost is the subject of a recent article in an American magazine, which points out that more than twenty years ago, in a report on the subject made to the Franklin Institute by Dr. Cole in Sellers and the late William P. Tatham, it was stated that, according to calculation, in a well-regulated machine-shop, thoroughly prepared for doing miscellaneous work, employing 250 workmen, the cost of a new outfit, adapted to new measures, would not be less than 30,000*l.*, or 120*l.* per man. If new weights and measures were to be adopted, so the report continued, all the scale beams in the country would have to be regraduated and readjusted, the thousands of tons of brass weights, the myriads of gallon, quart, and pint measures, and every measuring rule and rod of every description throughout the land, would have to be thrown aside, and others, which the common mind cannot estimate, substituted. The great mass of English technical literature would become almost useless, and would have to be translated from a language which we, and the nation we have most to do with, understand perfectly, into a new tongue which is strange to most of our people. As a question of cost, those who advocate this change consider it carefully. To the teacher, to the closet scholar, to the professional man, to those who never handled a rule or a measure, but use weights and measures only in calculation, it may seem merely a matter of legal enactment; but to the worker, the dealers in the market-places, to those who produce the wealth and prosperity of the land, the question is a most serious one. Altogether, the ultimate benefits of the change proposed would be of less value than the damages during the transition. Those who choose to do so can use the metric system, and no one can object to it; but for the Government to require its people to use that, and no other, would be an arbitrary measure, which they would be neither willing nor able to bear.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
30.....	Bradford Photo. Society	Flashlight Photography. George Swaine.
30.....	Stafford Photo. Society.....	Members' Work.
May.		
1.....	Gospel Oak	Demonstration: Platona Paper. H. H. Morgan.
1.....	Hackney.....	Defects and their Remedies. E. Dockree.
1.....	Redhill and District	Round about Redhill with a Hand Camera. T. Percival Padwick.
2.....	Edinburgh Photo. Society	Colour Values in Photography. Cameron Todd.—Nomination of Office-bearers and Councillors.
2.....	Southport	Demonstration: Messrs. Wellington & Ward's New Negative Film. Harry Ward.
2.....	Woodford	Chat about the Hand Camera. W. L. F. Wastell.
3.....	Röntgen Society	Ordinary General Meeting.
3.....	Tunbridge Wells	Plates and Papers for Pictorial Work.
4.....	Croydon Microscopical	A. Horsley Hinton.
4.....	West London.....	Negative-making. Rev. F. C. Lambert.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 24.—Technical Meeting.—Mr. T. Clapton in the chair.

A DEVELOPING MACHINE.

MR. W. F. CRAWFORD exhibited the "Express" Developing Machine, an apparatus for developing twenty-four negatives at once. The exposed plates are held in radial grooves between two glass discs, revolving on a spindle in a developing trough, similar arrangements being provided for fixing and washing. The machine is also adapted for use with films, and for developing or toning prints, the films or prints being supported in celluloid carriers.

PHOTOGRAPHIC SURVEYING.

Mr. BRIDGES LEE, M.A., read a paper on "The Latest Developments of Metro-photography," in the course of which he explained the method of surveying by means of his photo-theodolite, and illustrated the results obtained by it. Metro-photography has been defined by Mr. Bridges Lee as "that branch of technical applied science which is concerned with the determination of the forms and dimensions of objects from photographic pictures of those objects." By means of photographs taken from the roof of the Grand Hotel, in Northumberland-avenue, he showed how the exact position, dimensions, height, &c., of buildings or objects could be exactly determined and measured, the general idea of the instrument being to secure accurate and, as far as possible, automatic records on the faces of photographs of all, or nearly all, information which might be necessary for their correct interpretation for map-making purposes. The photo-theodolite is so designed and arranged that, whenever a photograph is taken (the apparatus having been first carefully levelled), there will be recorded on the negative accurate traces of the principal plane, the horizon plane of the instrument, the magnetic bearing of the principal plane, the principal point of the perspective, and a true scale of angular distances right and left of the principal plane. It has been extensively used in Canada and in North and South America, large tracts of country having been mapped by its aid, and it is in use to some extent in several Continental countries, particularly in Germany and Spain. A light-filter of chromium green glass is employed in taking the negatives, this having been found to give better results for distant views than the orange glass commonly used with surveying cameras.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 19.—Mr. Philip Everitt in the chair.

Mr. A. HADDON reported the result of his experiments upon the piece of glass shown recently by Mr. Thomas. Briefly, a piece of glass, supposed to be new, used for glazing a greenhouse, was found to develop in the space of eighteen months a strong image—the portrait of a man. Mr. Haddon failed to obtain evidence of either silver or mercury. He had come to the conclusion that, accepting the conclusive evidence that the glass at one time had been a photographic negative, the developer or something else had at the outset induced an incipient decomposition of the glass, and that exposure for a long time in the greenhouse to moisture and carbonic acid had continued the disintegration of the glass to the extent shown, the action being greatest where there was most silver in the original deposit. The distinct grey tint of the image was the silver. The weathering action of glass was, as a rule, due in the same way to the chemical action of moisture and carbonic acid, and not physical action.

Mr. THOMAS E. FRESHWATER gave a short chat on a branch of projection, namely, that of colour, by various methods at the disposal of the lantern lecturer. His remarks did not pretend to deal with the scientific aspect of the matter, as to go into this would require more than the time at disposal. He regretted that in their present state the very beautiful results of Professor R. W. Wood's diffraction process of colour photography could not be shown upon the screen. He was able, however, to pass one of these round for examination, made by Professor Wood and left by him on his departure from this country. As yet the colours were somewhat crude, but the process was a step in the right direction. Mr. Freshwater then showed on the screen, by means of a narrow slit and several specimens of gratings, the diffraction phenomena produced by ruling plates with as many as 8000 lines to the inch. With the first grating—one with 3000 lines per inch—the third order of the spectrum was plainly seen. Other gratings, including Thorpe's moulded copies, were shown, and varying degrees of dispersion, according to the frequency of the lines per inch upon the gratings, were obtained, the effects being very fine. Newton's colour test, a disc composed of slips of glasses of the primary colours, was shown, rapid rotation in the lantern giving a close approximation to white light upon the screen, while, at rest, the component colours forming the disc would, of course, be separately seen. Various mechanical slides for the projection of animated designs well known at lantern exhibitions were also shown. Some results by Joly's colour process were next projected, and some examples of Lumière's colour slides by the superposition of three stained photographic films. The function of the ruled screen in the Joly process was demonstrated by shifting, while the image was yet upon the screen, the ruled viewing screen the space of a single line at a time, when colour effects of an alarmingly false and exaggerated nature were produced. Referring to the development of the spectrum plate used in this process, Mr. Freshwater remarked that in his own work with them he found no reason for exceptional precautions about the dark-room light used. The negatives of some slides, made by himself and shown, were quite free from fog, but they were developed in the light he used for ordinary plates, direct light, of course, being excluded from the dish, in his case by means of a piece of ruby glass laid over it.

The CHAIRMAN said that with the same plates he made no further allowance for their greater colour sensitiveness than that involved in holding the dish above the source of light, so as to prevent direct light from reaching the plate.

Croydon Camera Club.—April 18.—The meeting was opened with a display of prints taken on the Club excursion to Cuckfield, sets being shown by Messrs. Maclean, Frost, Rogers, Kough, Bryan, and Wratten. The PRESIDENT (Mr. Hector Maclean, F.R.P.S.) then exhibited and explained a novel and ingenious miniature apparatus called "La Petite Cinematograph," which is specially suited to the amateur who desires to enjoy the delights and wonders of animated photography. The instrument in question, which measures but $8 \times 4 \times 3$ inches, is substantially and carefully made, the outer case being of polished mahogany. Although its cost is but 5*l.* 10*s.*, it will, without fail, take, print, and project moving photographs, each film running for the standard time occupied by the larger machines, viz., about fifty seconds. With the limelight a capitally illuminated picture, six or more feet in

diameter, can be shown. The films supplied for use with the machine cost but 2*s. 6d.* each. La Petite Cinematograph may also be used as a snap-shot camera and as an enlarging camera. The lens works at *f*-4. Members expressed much approval of the simplicity and compactness of the machine, which is made by Mr. Hughes, of Brewster House, Kingsland. Mr. MACLEAN promised to bring up some results of exposure with the above.

FORTHCOMING EXHIBITIONS.

1900.

- May 23-25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.
July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between April 9 and April 14, 1900:—

- COLOUR PHOTOGRAPHS.—No. 6756. "Improvements in Colour Photographs," T. W. BARBER.
SHUTTERS.—No. 7009. "Improvements in Photographic Shutters." S. D. MCKELLEN.
CINEMATOGRAPHY.—No. 7035. "Improved Cinematoscopic, Cinematographic, Chrono-photographic, and Chromo-photographic Apparatus." H. L. HUET and A. DAUBRESSE.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

PHOTOGRAPHY IN CHINA.

To the EDITORS.

GENTLEMEN,—The enclosed price-list of the Chung King Photo Stores may be of interest. As a passer-by I have been struck with the fact that, except at Shanghai and Hong Kong, there are no places in all China where so good and complete a stock of material is held.

The Stores owe their existence to the energy and enterprise of Mr. Davidson, of the Friends Mission, who has not only taught himself the practice of the black art, but also the Chinese assistants who work the processes; and quite a number of local Chinese portrait photographers owe their occupation to his initiation.

The Chinese take very kindly to having their likenesses taken. They much prefer to be photographed full face, both sides well lighted, so that their faces look as round, or flat and waxy, as possible. Shadows, lines, wrinkles, &c., are very objectionable.

A fact in connexion with these Stores is rather noteworthy. Everything has to be taken from Shanghai 1000 miles up the Yangtse by steamer at a cost equal to the freight from home to Shanghai.

Then there is the long, difficult and dangerous voyage of some 500 miles up the rapids and gorges of the Upper Yangtse in native craft, a considerable proportion of which are wrecked. This journey takes nearly two months by the cargo junks at the most favourable time of the year.

Freight and loss by wreck are expensive items; nevertheless, portraiture is marvellously cheap, as may be seen by the list.—I am, yours, &c.,

J. GRANT BIRCH.

Chung-King, Ssu-ch'uau, Western China, February 24, 1900.

[The circular which Mr. Birch is kind enough to enclose in his interesting letter is as follows:—Eds.]

CHUNG-KING PHOTO STORES.

PORTRAITS.

Price for First Copy.

	Unmounted.	Mounted.
Carte-de-visite	Taels .40	Taels .45
Cabinets .....	.60	.65
Whole-plate ($8\frac{1}{2} \times 6\frac{1}{2}$)	1.00	1.10
10 x 8 groups	2.00	2.25

	<i>Price per Copy after First.</i>	
	Unmounted.	Mounted.
Carte-de-visite	Taels .10	Taels .12
Cabinets .....	.15	.20
Whole-plate ($8\frac{1}{2} \times 6\frac{1}{2}$) .....	.25	.35
10 x 8 groups .....	.40	.60

Price per Ten Copies.

Carte-de-visite	1.00	1.25
Cabinets	1.50	2.00
Whole-plate ($8\frac{1}{2} \times 6\frac{1}{2}$)	2.50	3.25
10 x 8 groups	4.00	5.50

The above price for ten copies includes the first.

Second Sitting, if required, price extra.

Carte-de-visite .....	.15
Cabinets .....	.20
Whole-plates .....	.40
10 x 8 .....	.60

VIEWS.

Quarter-plates ($4\frac{1}{2} \times 3\frac{1}{2}$), each .....	.05	.07
Half-plates ($6\frac{1}{2} \times 4\frac{1}{2}$), .....	.10	.15
Whole-plate ($8\frac{1}{2} \times 6\frac{1}{2}$), .....	.18	.25

(10×8),

.30 .50

N.B.—The above prices are in taels and cents. The tael at present is worth a little less than 3s. English.—J.G.B.

THE KEEPING QUALITIES OF DRY PLATES.

To the Editors.

GENTLEMEN,—We have noticed from time to time during the last few months notes in the photographic press as to the keeping qualities of dry plates. The following correspondence from Professor Carlton Lambert, of the Royal Naval College, Greenwich, may therefore be of interest to your readers. On March 6 last Professor Lambert writes:—

"It may interest you to know that I have just taken two excellent negatives on plates of your manufacture, which are fifteen or sixteen years old. I have the box and ten of the plates (half-plate) remaining."

In reply to our application for particulars of batch number and some of the unexposed plates to test, we received the following letter:—

"I am now sending you the packet of plates referred to, minus two which I have used, and each of which gave me excellent negatives and prints, which are at your service, or will be if you care to have them. You will be able to verify the age of the plates. I speak from memory only when I say that I believe they are about fifteen years old."

The batch number we found to be 2119, and, on referring to our manufacturing book, we found the batch was actually made in August 1889, thus nearly eleven years old.

Recently turning out some old stock, we came across some packets of plates about ten years old, and on exposing them obtained good negatives, therefore it would appear that the keeping qualities of dry plates have been very much belied.—We are, yours, &c.,

MARION & Co.

22 and 23 Soho-square, London, W.C., April 8, 1900.

OZOTYPE.

To the Editors.

GENTLEMEN,—I have noticed in your Correspondence column a letter signed "J. F. T." with reference to "Ozotype." If your correspondent will kindly wait about a month longer, he will be able to obtain all the materials required for the working of the process. The sensitising solution, and a specially prepared tissue called "pigment plaster," will be put upon the market, and a handbook giving full instructions will be published. In view of the number of personal applications that are made to me for information and materials, I will take this opportunity to assure intending workers that every effort is being made to supply them commercially as soon as possible; but few people know the difficulties, delays, and attention to the smallest detail involved in placing an entirely new process upon the market.—I am, yours, &c.,

140, Haverstock-hill, N.W., April 21, 1900. THOMAS MANLY.

LONDON VISITORS TO THE CONVENTION.

To the Editors.

GENTLEMEN,—Although it is still a far cry to the Convention, I should like a preliminary note inserted in your columns to the effect that I am undertaking the arrangements for a party to travel to Newcastle by one of the fine boats of the Tyne Steam Shipping Company, of which my father is Managing Director. The steamer sails on July 7 from the Free Trade Wharf (Stepney Station) at seven p.m., and, with anything like reasonable weather, will arrive at Newcastle at six p.m. on the Sunday, a voyage of twenty-three hours.

We shall have the evening on the Thames, and the best part of Sunday at sea, with many opportunities for hand-camera work. I am unable to obtain reduced fares, owing to the fact that at that time the boats are invariably full, but I shall be able to arrange for reserved berths and make the party comfortable generally. On Saturday night there will be a concert in the saloon.

The fare is 12s., and contract for meals 6s. 6d. for the voyage; return-fare, 18s., the boat leaving Newcastle on Saturday, July 14.

I should be glad to hear early from those who would like to join the party for a pleasant voyage to the Convention.—I am, yours, &c.,

166, Romford-road, E., April 20, 1900.

WALTER D. WELFORD.

ACHROMATIC STOPS.

To the Editors.

GENTLEMEN,—I notice in last week's JOURNAL some cameras for sale, the lenses of which are fitted with achromatic stops. Can any of your readers explain the use of these and their advantages, if any?

Some time ago I remember instantaneous dark slides being advertised for sale, and it occurs to me that, if achromatic stops and instantaneous dark slides could only be used in conjunction, the result ought to "stagger humanity."—I am, yours, &c.,

DROP SHUTTER.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

T. M. Barbour, 1, Brierley-street, Bury.—Two photographs of the Bury football team. Photograph of Mr. George Ross.

A. & G. Taylor, 127, Sauchiehall-street, Glasgow.—Photograph of the Scottish International football team and officials, 1900.

G. Morrison, Cumberland-square, Birr.—Photograph of Birr Castle, Parsonstown. Photograph of Nenagh Catholic Cathedral. Photograph of Lord Rosse's telescope.

ADDRESS.—The last address advertised was 64, Union-street, Stourbridge.

E. J. SMITH.—Theoretically, your requirements would be met by the use of the Cadett spectrum plate and the special filters provided for them.

STEVEN (Glasgow).—1. Schlippe's salt is sulphantimoniate of sodium. 2. The question concerning acetylene is too vague for us to answer; kindly repeat it explicitly.

REX.—Sorry we are unable to offer a suggestion; but we recommend you to write to or call upon the London agents, Messrs. A. E. Staley & Co., 35, Aldermanbury, London, E.C.

R. N. R.—A matter in which we regret we are unable to help you, as it is an old and strict rule of ours never to give comparative advice. If you can favour us with a call, we shall be glad to see you.

FORMULA WANTED.—DRY PLATE asks for a good formula for matt varnish. A good formula for matt varnish is that given on page 1087 of the ALMANAC, and we do not think it can well be improved upon.

THOMAS LEWIS.—We have no personal knowledge, but probably the necessary facilities could be had, or ascertained, at the establishments of the Eastman Kodak Company, Avenue de l'Opéra, 5; Place Vendome, 4.

J. MC LAINE (Portree).—The initials probably stand for the name of Messrs. George Mason & Co., of Buchanan-street, Glasgow. Such a lens would probably fetch a third of its value in the sale-room. We do not undertake to answer questions through the post.

STALE PLATES.—W. H. W. The fault is, that the plates are stale. Of course, there is always a risk of that in buying job bargains at a quarter of the regular price. The chemist evidently knew the plates were faulty, or he would not, of course, have sold them at so great a loss.

ADDRESS WANTED.—E. BOLAM writes: "Can you inform me the London address of Messrs. Griffiths & Griffiths, stereoscopic slide publishers?"—In reply: We do not know Messrs. Griffiths & Griffiths' address. Does our correspondent mean Messrs. Underwood & Underwood, of 26, Red Lion-square, W.C.?

FORMULA WANTED.—F. D. P. writes for a formula for making a collodion emulsion for ferrotype dry plates.—Personally we have had but little experience with emulsions for ferrotype pictures, and we know of no better formula than those given in the ALMANAC. We do know, however, that some workers have been successful with them, but whether they modified them to suit their requirements, or not we are unable to say.

COPYING OLD PAINTING.—W. NASH. If the painting is as yellow as you describe, and has no blue in it, use an isochromatic plate without a yellow screen. Under the circumstances, it would be of no advantage.

AGREEMENT.—OPERATOR. We have read through the agreement, which we have posted back to you, and it seems very fair and equitable. Bear in mind, however, that it is of no value until it is stamped. Get it stamped without delay; it will only cost you sixpence.

WATER.—Our answer to your questions, which we have not retained, was intended to convey the advice that you should use boiled water for all your operations, and so it reads to us. We used the tap water of your immediate neighbourhood for years, and found no ill effects to result on our negatives and prints, of which we made many hundreds.

THE NEW POSITIVE PROCESS.—DAN OSBORNE writes: "Can you let me know whether the new positive process is on the market yet, or likely to be?"

—In reply: If our correspondent refers to the positive process of Messrs. Thornton & Rothwell, described in our pages a few weeks ago, he had better write to the Thornton Film Company, Altringham, Cheshire.

MARKINGS ON GLASS POSITIVES.—R. WALTHEW asks: "Can you please tell me the cause of the silver-like markings in the shadows of the two glass positives enclosed, they are by the wet-collodion process?"—The two pictures arrived smashed, through faulty packing. The stains are due to the pictures being taken on dirty plates; i.e., very imperfectly cleaned.

COPYRIGHT QUESTIONS.—PIPER writes: "1. How can I get to know if a photograph is registered or copyright? 2. Can a photographer make a photograph of a group, copyright or registered, without the consent, in writing, of the members of that group?"—In reply: 1. By searching the register at Stationers' Hall, London, E.C. 2. Yes; if he was not paid for taking the photograph.

STUDIO-GLAZING.—ROOF writes to know the best kind of glazing for a studio roof, to ensure it being quite waterproof. We know of nothing better than good putty. It should be made with the best linseed oil, and a little white lead in it is an improvement. After the glass is cemented in, a couple of coats of paint should be applied. A great conductor to a water-tight roof is rigid sash bars that do not give with a strong wind and so crack the putty.

BOOK WANTED.—E. DICKSON writes: "I should be greatly obliged to you if you would inform me what you consider the best all-round book for a beginner, and where to be obtained?"—In reply: A very good book for a beginner is *Early Work in Practical Photography*, by Mr. Ethelbert Henry. It is published by Messrs. Dawbarn & Ward, of 6, Farringdon-avenue, E.C. If this does not meet your requirements, write again, and we will make a further suggestion.

ADDRESS WANTED.—MR. ROBERT STEWART, of 135, High-street, Elgin, writes: "In the JOURNAL of February 24, 1899, Mr. C. Brangwin Barnes has an article, 'The Restoration of Daguerreotypes,' and I wish to send him one to restore for me, if he takes these in hand. Will you please send me his address?"—In reply: For the moment we cannot place our hands on Mr. Brangwin Barnes's address. Will that gentleman please communicate with Mr. Stewart direct?

BLACK TONES.—J. WILMOUR says: "Herewith four prints, and, as you will see, they are of a very warm brown tone, and I can get nothing else tone as deep as I will. I want to get a deep purple-black like I see in some of the old albumen prints."—You will not be able to get them on gelatine paper, nor, we suspect, on albumen paper, from such weak negatives as the samples sent were evidently made from. Deep purple-black tones are only obtainable, even on albumen paper, from very vigorous negatives.

STOPPAGE OF WAGES.—C. J. E. writes: "Will you please say what is the rule with regard to Good Friday and Easter Monday? Our governor has stopped our wages for Good Friday, and is going to do the same for Easter Monday, as he says we were not at work, and should not be paid. There are four of us employed, and we are all served alike."—Such a proceeding is very unusual; indeed, we never heard of such a thing before in the photographic profession. We much doubt its legality, with weekly servants.

INK ROLLER FOR COLLOTYPE.—T. CROWLEY says: "I am going to try colotype, and a friend has given me a leather litho roller that has laid by, covered with ink, for ten or twelve years, and is very hard. Do you think this will do for the leather roller for colotype work?"—In its present condition, certainly not, and we doubt if it can be made available without a new leather cover. Before having it re-covered, you might take it to a lithographic printer and ask him if he can get it in good condition for you—though we doubt it.

OPALESCENT COLLODION.—C. FISHER says: "I had a bottle of enamel collodion which had got too thick to flow well, and I thinned it with methylated spirit. Now it does not flow a bit better, and the film, when dry, is like whitewash; what is the reason?"—The collodion should have been thinned with a mixture of ether and alcohol, then it would have been all right. Methylated spirit, by itself, should not have been employed. Add some ether to it, and if "methylated finish" was not used, though we suspect it was, all will probably go right.

STUDIO-BUILDING.—DAN OSBORNE writes: "I want to build a portable photographic studio, one that can be bolted together quickly, outside to be of zinc. I want gallery, developing room, and waiting room; or could you tell me where I could get one? I want all information it is possible to get, as I think of making it myself."—In reply: Messrs. E. C. Walton & Co., of Newark, would probably supply you with a suitable studio. As a guide to construction, Mr. Bolas's book on the subject, published by Messrs. Marion & Co., Soho-square, should be found useful.

STAINED NEGATIVES.—HUGO WEITZELL. The stains are clearly due to imperfect fixation. Had the negatives been properly fixed in the first instance, they would not have become stained in the intensification. The remedy in the future is obvious, though the stains cannot be got rid of now.

COPYRIGHT.—DOUBTFUL. You seem to be somewhat confused about the Copyright Act. The Bill introduced in the Lords last year, and the one this, have not become law, therefore they in no way whatever affect the existing Act. The law remains the same as it has been since 1862. The introduction of new Bills does not affect existing laws until they are passed.

RENOVATING BLINDS.—D. McFARLANE says: "Last spring I had new white blinds for the roof of the studio, now they are very dirty and stained with water from the roof. When I have had blinds washed before, they never have hung or run on the rollers well. Can you give me any hint as how to avoid that this time?"—We fear not. Linen or cotton blinds, after they have been washed, are rarely satisfactory, as they generally stretch unequally, and for that reason do not roll tightly on the rollers, and "bag" in the centre. Moreover, after a year's exposure under the roof of the studio, the fabric usually gets pretty rotten.

MARKINGS ON PLATINOTYPE PRINTS.—ARTHUR JONES writes: "Enclosed platinotype print has streaky markings, which markings, I am sorry to say, appear in many of my prints, the cause of which I am at a loss to account for. Should be glad if you could assign a cause for such faultiness, and tell me how to remedy it. I use a fresh developer and dry pad, also the paper is free from damp."—The print sent has the appearance of being floated on the developer while there was a scum on the solution, such as will, sometimes, arise when it has been allowed to remain long in the dish. This is the only way we can account for the markings on this particular print.

ASPECT FOR STUDIO.—QUANDARY writes: "I intend to start business in this town, and have the option to two places, and cannot decide which to take. In either I shall have to build a studio. One is in the best street in the place and the best place for business; the other is in not so good a situation for business. In the first place referred to I can only get a south-east by east light; but in the other I shall get a direct north light. I shall be much obliged if you will give your opinion as to what I should do."—By all means decide upon the best business situation, even if the studio will not be quite so easy to work as one with a north light. Bear in mind, the quality of the work is more dependent upon the skill of the worker than aspect of the studio.

DETERIORATION OF LENSES.—H. H. asks: "Do lenses deteriorate by constant use? I used to take my *carte* pictures with a pair of No. 1 B lenses on a bi-lens camera. Now I use a cabinet lens for the purpose. Three or four years ago I took off one of the No. 1 B's and put it on a smaller camera, and have since used it for midgets. Now I have replaced it on the old camera, and have been taking some stereos with it, but in all cases the lens that has been in constant use does not give so bright a negative as the other—that half looks slightly fogged, while the other is brilliant and clear."—In all probability, with the lens that has been in constant use, the blacking on the mount has become somewhat worn off or bright. Reblack the insides of both the tubes, and we have little doubt but the lenses will again work in unison as well as they ever did.

VALUE OF LENS.—TAFFY writes: "The lens I wrote about a fortnight ago was acquired by the present owner from the late Mr. Heavysides, of Durham, when he took over the business. Wishing to know the value of this and other lenses, he wrote Messrs. Ross, and was informed that Mr. Heavyside had paid 34/- 10s. for it. I think this was the price; but, any way, the facts are about as I state them. The lens would possibly be catalogued at 38/-, and ten per cent. discount allowed. Personally, I don't know the date of the purchase; it may have been thirty years ago or more."—Probably the lens is one of the old 38/- portrait lenses; if so, it is for 10 x 8 portraits, and of about eighteen inches focus, not twenty-eight inches, as stated in your previous letter. These large, old forms of lenses have not much value in the market at the present time.

ERYTHROSINE IN BICHROMATE PROCESSES.—CONSTANT SUB. writes: "In your JOURNAL of December 22 last, p. 806, there is a short note entitled, 'Erythrosine and Bichromate Films,' of which, to save you the trouble of reference, I subjoin a copy: 'The *Photographische Chronik* mentions that the sensitiveness of the bichromate processes may be considerably enhanced by the use of erythrosine. As an instance, it mentions that the exposure of an ordinary collotype plate was reduced to an hour and a half in bad winter light, whereas in the ordinary way it took two and a half days to print under the same conditions. Similar results have been observed with photo-litho papers and the fish-glue and albumen processes.' As I would like to try the effect of such addition, I should be glad to know in your Answers to Correspondents column: 1. Whether you have had any experience of its efficacy or otherwise in this direction, as this might save me the trouble of trying it? 2. Whether it is easily obtainable of good quality or I would have to get it from London; and, if the latter, from whom, and (if you know without the trouble of finding out) the price of small quantity for trial? 3. The quantity I would have to add to a solution of bichromate of potassium of, say, ten per cent. (or other, if better) strength? 4. Being a dye, would it stain the paper, or, thus combined with the bichromate, be washed out, as is the case with the latter alone, in, of course, the more or less unexposed parts?"—In reply: 1. We have not tried the addition. We quoted the note as it appeared in our Continental contemporary. 2. Erythrosine is readily obtainable from such houses as Hopkin & Williams, Cross-street, Hatton Garden. The price is about 1s. 6d. an ounce. 3. Not having tried the addition, we cannot offer an opinion. 4. Probably a tint, more or less, will remain in the film.

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EX CATHEDRÂ.

We are asked by the Hon. Secretary of the Royal Photographic Society to announce that the Fellowship Admissions Committee will meet early in June to consider applications from members for the Fellowship. Candidates must send in their applications, on forms to be obtained from the Secretary, by May 31. For the information of intending candidates we append, once more, the regulations which have been drawn up by the Council to govern the admission of Fellows:—Admission is by the Council. Applicants must first become ordinary members of the Society. It is desirable that a candidate should furnish the names of one or more members of the Society to whom he is personally known. Every application shall be accompanied by a statement of the qualifications of the candidate in relation to one or more of the following heads: Important contributions to photographic knowledge, either in theory, practice, or invention; the production of notable work, either in pure photography or in the arts and sciences kindred thereto; work done in disseminating photographic knowledge; any public service tend-

ing to the advancement of photography. The heads specially dealing with students are as follows: The student must show, to the satisfaction of the Council, that he has received a suitable general education, and that he has a good knowledge of photography in general, or, at least, a fair knowledge of the general subject and a special knowledge or experience in one or more of its branches. As to general education, the Council suggest the following examinations:—the matriculation, preliminary or entrance examinations of the various universities and colleges, the Oxford and Cambridge local examinations, the higher examinations, the higher examinations of the College of Preceptors. In photography and allied subjects, the Council suggest the examinations of the City and Guilds Institute in photography, especially the Honours stage, the examinations in chemistry, physics, drawing, painting, and other allied subjects held by the Department of Science and Art and the various educational bodies.

* * *

THE measure of success which has so far attended the Yorkshire Photographic Union since its formation about fifteen months ago is set forth in the annual report just issued. From this document we learn that the main feature of the Union's work is its lecturing scheme. The lecturing staff of the Union for the past session numbered twenty-five names. These gentlemen promised to deliver, in the aggregate, eighty lectures to the federated societies. The subjects of the lectures cover practically all photographic topics, of an elementary as well as an advanced character. The list contains the names of the best photographic workers in the county. The number of lectures actually delivered by the Union staff during the past session is eighty-four, four more than the total number promised. The average number of lectures supplied to each society during the past session is five. The Union now numbers eighteen societies, representing, roughly, about 1500 members, and the Committee claim that it has justified its existence. "It has done for the photographic societies what no other organization has ever attempted to do; it has infused new life into some societies that were drifting into a moribund condition; it has brought the various societies in the county

more closely together, and the officials into personal contact with each other; and last, but not least, it has made the position of secretary of a small photographic society, at any rate, much less onerous." The modest and business-like programme of the Union appears, indeed, to have been well carried out, and the record of its first year's work is one upon which it is distinctly to be congratulated. We wish the Yorkshire Photographic Union a continuance of its initial success, and trust that the sphere of its usefulness to photography will enlarge with its age.

* * *

MESSRS. F. & R. SPEAIGHT, who for some time past have devoted themselves with great success to juvenile portraiture, announce an exhibition of photographs of "Children of Royal and Noble Birth" by Mr. Richard N. Speaight, at their studios, 178, Regent-street, London, W. The Exhibition will be open to the public from May 11 to August 4, and we gather from a list sent us that it will include sixteen portraits of Royal children, and considerably over 100 of young people of noble birth. The Exhibition should be very attractive, especially to ladies, a great number of whom will, no doubt, avail themselves of the opportunity afforded them by Messrs. Speaight of studying the productions of this interesting branch of photography. As a proof of their success in children's portraiture, Messrs. Speaight are able to announce that they are "child photographers to the Royal Family," an unofficial recognition, we take it, of the satisfaction which their work affords to their distinguished patrons.

* * *

THE prospectus of the forthcoming Exhibition of the Royal Photographic Society at the New Gallery, Regent-street, was issued this week. In another part of the JOURNAL we reprint those parts of the document which specially deal with the five sections into which it is proposed to divide the Exhibition, viz.: 1, Pictorial Photography; 2, General Professional Work; 3, Photographic Apparatus and Material; 4, Photo-mechanical Processes; 5, Scientific and Technical Photography. Those of our readers who are interested in the Exhibition, and have not received a copy of the prospectus, may obtain it on application to the Secretary of the Society, 66, Russell-square, W. The increased space obtainable at the New Gallery, and the subdivision of the building into several large rooms, gives the Royal Photographic Society this year the opportunity of making some important experiments in regard to the scope of its Exhibition. For a considerable time past there have been complaints that professional work, photographic apparatus, and what is understood by the term "technical photography" have not been encouraged at the exhibitions held in the Pall Mall Gallery, and the prospectus before us is, we apprehend, symptomatic of an attempt to remove those disabilities, if such they be. In other words, the scope of next October's Exhibition has been widened to the utmost extent, and, if the evident expectations of the prospectus are realised, a thoroughly representative and comprehensive Exhibition should result. We shall have other observations to make on this subject later in the year.

* * *

THE interesting Society of Arts' paper on process work by Mr. Carl Hentschel, which we reprinted last week, gave some details of the extent to which engraved half-tones are used by many of the London newspapers; but it would appear from

some recently published remarks by Mr. S. H. Horgan, the head of the *New York Tribune's* art department, that London is pushed hard by New York for rapidity and enterprise in this class of work. Mr. Horgan tells us that on Thursday, January 21, 1897, there was published on the front page of the *Tribune* a portrait of the Hon. Thomas C. Platt, on the occasion of his election as United States Senator. This portrait was printed from a "half-tone" engraving, which up to that time was regarded as an impossible method for the daily newspaper. Still, the *Tribune* printed this half-tone picture on its rapid web-perfected presses without any change in its machinery or in the quality of ink or paper used. From that date to this the illustrations in the *Tribune* have been the marvel of other newspaper proprietors, both in the United States and in Europe, and half-tone illustration is being tried with more or less success by newspapers everywhere. What possibilities the future holds for this latest improvement in newspaper engraving and illustrating may be predicted from the *Tribune's* recent triumphs in photographing famous dinner gatherings and reproducing the photographs perfectly by the fast-printing press a few hours later. In the way of rapidity, the last-mentioned instance of the New York journal's enterprise would not be easy to excel. Mr. Hentschel's references to the practical extermination of wood-engraving by half-tone are virtually duplicated by another American writer, who remarks that photo-engraving has driven out of employment the ordinary engraver on wood. A few men of extraordinary artistic ability, like Cole and Johnson, are unaffected by this invention, but the art of ordinary engraving on wood is as dead as the old art of alchemy. By the new art of photo-engraving the design of an artist can be reproduced in high relief without the intervention of any engraver, and at about one-tenth of the old cost in time and money, but the work so done, while faithfully executed, is insipidly weak. To bring out its best points the old engraver on wood now finds some employment in retouching and developing the monotonous work. Notwithstanding all the great improvements by machinery the old truism holds as good now as it ever did, "The man is more than the machine." All through, matters in these respects are very much the same in New York as in London.

IODIDE OF MERCURY INTENSIFIERS.

We are aware, of course, that to some photographic purists mercurial intensification of any sort is *anathema maranatha*, but the fact remains, that mercurial salts are, and have been, since the advent of collodion photography, in constant employment for increasing the opacity of negatives that, without its aid, would not give presentable prints. It is not many years since we examined some mercurially intensified negatives, which we saw undergo the operation of intensification over forty years ago, yet they were in perfect condition. The process was the preliminary whitening by mercuric chloride, followed by a blackening with weak solution of ammonic sulphide. For many years this, with the occasional substitution of ordinary ammonia solution in lieu of the sulphide, was in common use; indeed, the early workers in collodion, when requiring a negative, perhaps, more frequently used a "converted positive" than a directly developed negative. After a while a number of other variations were introduced, preference being given to one or the other in capricious fashion. In the early

ys of gelatino-bromide plates recourse was often had to tensification, mostly on the old lines, till Mr. B. J. Edwards produced a novelty in the shape of a one-solution intensifier, made by mixing mercuric chloride and potassic iodide solutions and adding "hyposulphite of soda;" a plan reduced to more exact method by Mr. Watmough Webster, who first precipitated, separated, and washed the mercuric iodide, and dissolved it in infinite proportions.

Used with care, the Edwards' intensifier was a most valuable tensifying agent, and, as regards permanency, we have reason to believe excellent. We have seen negatives seven or eight years old intensified by this agent which were apparently unchanged; yet we are bound to say that we have seen a far larger number that had certainly undergone a change for the worse—the density of the image lost and a yellow stain over all. The negatives that had stood the test of time were such as had been subjected for a brief time to a second bath of pure hypo after being intensified.

This intensifier gave a beautifully clean result, and, when freshly made, brought about the increase of opacity with little or no apparent change in the colour of the image. One great advantage of a one-solution intensifier is the facility it affords for local treatment. Taking the plate after being slightly washed after fixing, we have found it a perfectly simple matter to add to the opacity of any particular region of the negative by simply applying the solution, with the finger, with a gentle circular movement, flushing the solution away with a copious supply of water when the required effect was produced. It is better to slightly overdo the density, so that an after-treatment with hypo would clear the negative and tend to permanency of results. Negatives treated by this, or, indeed, by most mercuric intensifiers, can, if too dense, be easily reduced again by a hypo solution.

Within the last few months Messrs. Lumière and Seyewetz, whom photographers are already greatly indebted for their established investigations of many photographic problems, have produced a further most important modification of this intensifier. In lieu of dissolving the mercuric iodide (a brilliant scarlet powder used by painters under the name of "scarlet vermillion") in hypo, they dissolve the dry iodide in sulphite of soda solution. When well washed for not too protracted a time, the negative so treated may be looked upon as most as permanent; but, to be on the safe side, the inventors recommend that, after well washing, the plate be put in some ordinary developing solution for a short time; it is then expected to be absolutely permanent. The formula is simple—it consists merely in dissolving one per cent. of the red mercuric iodide in a ten per cent. aqueous solution of anhydrous sulphite of soda. Whenever and wherever this formula has been reproduced the anhydrous salt forms an integral part of the constituents; but, if pure sulphite of the ordinary crystalline kind (so long as it is in good condition and not effloresced) be employed, it will be equally efficacious. But it must be remembered that the anhydrous is, through the absence of water, about double the strength of the crystalline form.

We have tried the new iodide-in-sulphite intensifier, and have nothing but praise for it, and a careful study of Messrs. Lumière and Seyewetz's paper upon the cause of deterioration in negatives intensified with mercuric iodide warrants us in arriving at the conclusion that negatives intensified by this new process, with the precautions alluded to being taken, will prove to be absolutely permanent.

Ghostly Images.—A mysterious image on a piece of glass, used in glazing a greenhouse, has proved an interesting topic at two or three meetings of the London and Provincial Photographic Association. No satisfactory evidence was forthcoming as to how the image got there, beyond the undoubted fact that the glass was at one time a photographic negative, a portrait of a gentleman. In the days of the wet-collodion process, when the glass was frequently used over and over again, it was no infrequent occurrence for a previous image to make its appearance when the negative was developed. This image was, of course, always very faint, and sometimes, in the hands of charlatans, was passed off as a "spirit photograph." These secondary images were more frequent when patent plate was employed than when ordinary crown glass was used. This was easily accounted for by the fact that the latter had the natural surface of the glass, whereas the former had an artificial one, brought about by the grinding and polishing it had undergone. When this glass had been cleaned and polished, and then allowed to remain standing for a day or two, the old image could often be seen by simply breathing upon it; but, if the glass was treated with nitric acid, or it was cleaned with tripoli or rouge, which removed some of its surface, a previous image rarely made its appearance. With Daguerreotype plates, too, when used a second time, it was not an infrequent thing for a trace of the previous image to show faintly in the picture. With gelatine plates this is not at all likely to happen, for the glass is always used with its natural surface, and is rarely employed a second time. The glass upon which negatives have been taken and cleaned off is often employed for glazing greenhouses and garden frames, and much of it has been sold for that purpose, and we shall not be at all surprised if other mysterious images are discovered as time goes on.

The Forthcoming Exhibition at Glasgow.—The promoters of the International Exhibition to be held in Glasgow next year clearly mean it to be a great success, and, no doubt, it will be. There is already a guarantee fund of over half a million sterling. Last week, at the meeting of the Common Council of the City of London, a deputation from Glasgow, headed by the Lord Provost, attended, and solicited the co-operation and support of the City of London Corporation, not in the shape of money, but in loans from the City's collection of works of art, drawings, models and other objects of interest. It is almost needless to say that the request was readily acceded, and it was at once referred to the Library Committee to ascertain in what ways and in what directions the City of London might be represented at the Exhibition in loans of interesting and useful objects. In the interview the Lord Provost mentioned that at the last exhibition, held in Glasgow in 1888, the net profits amounted to 50,000*l.*, which was devoted to the purposes of the Art Gallery and to other useful and meritorious ends in the interests of their citizens. Glasgow, like many other municipalities, has very fine art collections, and it has lent some of its treasures to the present Exhibition at the Guildhall. Many of the municipal art galleries have a finer collection of pictures than that owned by the Corporation of London—the first city in the world; but efforts are now being made to increase it. Photography will be a feature in the forthcoming Glasgow Exhibition, and it is to be hoped, and expected, it will be well represented both from home and abroad, as it will be an international show.

Was it a Wart on the Nose?—An amusing paragraph has appeared in an evening contemporary. According to it, an enterprising clothing firm at Chicago was desirous of presenting their customers with souvenirs of Admiral Dewey, and ordered 5000 white medallion portraits of that celebrity. When they were delivered, it was noticed that each presentation of the hero of Manila showed a wart upon his nose. Then Mrs. Dewey and Admiral Schley were telegraphed to, and both averred that the nasal organ in question was wartless. The medallions were therefore returned, but the one who supplied them affirms that they were all right, and is threatening law proceedings to recover payment for them. Now, it is quite conceivable that, if the die-sinker worked from a photo-

graphic portrait, and most probably he did, and the one supplied to him had a spot on the nose, say, from a pinhole in the negative or a spot on that individual print, he might well have thought it "was part of the play," and therefore reproduced it, possibly with emphasis, and, as he may have thought, to enhance the likeness. What is more natural? Any how, it will be noticed that the tale comes from America, and we are not responsible for the facts.

A Paris Innovation.—It has been decided by the Paris Municipal Council to place tablets at the corners of the principal streets, inscribed with a brief statement of their origin and history. These will, no doubt, prove of interest to visitors to the French capital, and photographic ones should note. By this innovation they will be enabled, when photographing the street, to get its history and origin on the negative, that is, provided the corner of the street happens to be included in the view. It will be interesting to see how the history and origin of some of the streets will be dealt with—those, for example, that have had their names changed from time to time for political reasons. If the same system were followed in London, it would, no doubt, be interesting to country visitors, that is, if the street corners of the busy streets of our metropolis were more convenient places for persons to stop and read. One thing is certain, if the system were adopted, and that is, that it would afford plenty of food for discussion in the newspapers as to how many of the old streets, lanes, and courts in the City came by their names.

Photography and the Koran.—The authorities at the Paris Exhibition seem at the present time to be somewhat in a fix. In order to prevent fraud, it appears that the admission tickets of the exhibitors must bear photographs of their holders. There are, however, a large number of Mussulman exhibitors and their assistants, and it is quite against the tenets of the Koran that they should have any likeness of themselves made. For this reason a number of Algerians, Tunisians, and other Mohammedans positively refuse to have their photographs taken. The authorities, it is said, are very much perplexed as to the means to be taken to overcome these religious scruples. But it is very obvious that one party or other will have to give way. It is pretty well known that in Mohammedan countries professional portraiture is not a good business, that is, amongst followers of the Koran.

THE PHOTOGRAPHER'S YEAR.

MAY.

"Life looks like a dream
On a bright May day."

So sang the member of a string band on the shady side of the street of a west country town more years ago than one now cares to count. The voice was probably not of the first water, more than the skill of the accompanists, but it was a bright May day, both of the yearly calendar, and the life calendar of at least one of the listeners. May ever since to him has been the dream month. Not the dream that comes after the late supper, this is the November one. But the day dream that steals gently over the soul, when with a free conscience and an unobstructed liver, their fortunate possessor, with straw hat tilted over his eyes, lies on the sloping bank watching the ripple of water and soft sway of tree-tops. Many others, doubtless, without the help of the singer and the band, unconsciously regard the month in much the same fashion. The touch of ethereal sweetness in the air, the freshness of tree and hedgerow in their new dress, the grace and colour of flowers, and the song of birds compel the feeling and give rise to the highest pleasure. With the average grey of things earthly as normal standards to compare with, we are forced outside into dreamland for a fitting expression of the keenness of delight.

But going into dreamland is going altogether beyond the reach of photography—at least beyond its present reach, for possibly some future Röntgen may bring about the possibility of impressing "the unsubstantial fabric of a dream" upon a photographic plate, and oneiro-photography be as well recognised a division of the art as micro- or tele-photography. But this is a feature for the future, photography halts as yet in the power of giving a full impression of the airy, dreamy, beauty of May, is less

suitable for the particular purpose probably than many other means, the of the word-painter and artist, for instance. Still, it can do a great deal and the wider the range of effort the more may unsuspected capacities unfold themselves, and the better will be the result. Light, airy, fleet grace are the qualities that would go to make characteristic pictures of May. They are unfortunately those wanting in the majority of photographs. Presumably they are those most difficult to render photographically, inasmuch as many able and appreciative workers must have tried to express them.

For our comfort, it should not be forgotten that they are very high qualities and difficult to express in any fashion. The trained artist, expert writer, and eloquent speaker find them the ones most difficult to incorporate into picture, book, and speech. They have the feeling of what they want, but the expressing media are too gross to do justice to such delicate impressions. The photographer, with a soul above a developing formula, experiences much the same feeling and disappointment when taking a walk in the country on a May morning, or lingering along the riverside on a May evening. The impressionist picture is an effort to solve the difficulty, but by wrong methods. The feeling that leads to the attempt is most elevating, the result is emphatically nothing of the sort, on the other hand, most depressing.

The strong point of photographic work, extreme mechanical fidelity of execution, must not be ignored, but made proper use of, if a true result is to be gained. If allowed, however, to act without a refinement of judgment, the result is the one we are familiar with in the good photographic picture, a frameful of perfectly rendered detail, texture, and light and shade. We ought to admire it to the full, as coming as near to perfection as possible, and, had Adam not eaten the apple, we would probably do so. As it is, we unconsciously resent something about it, much the same way that we do the occasionally lucky man we know who, born without any hereditary tendencies to skip over the boundaries of the orthodox, and, further, reared with an educational comprehension of all-roundness, also fills his frame, from corner to corner, with uniform coloured perfection.

It is ticklish walking. We cannot say that we wish for a fault; for anything out of focus; but we would like a blank space here and there as a relief—and, probably, a sop to our own less perfect clay—a little air, grace, and suggestion, in place of closed-in solidity. Instead of the perfect whole we should aim for a perfect part—much less difficult to gain—but let that part be so essential a one, and all pertaining to it naturally arranged, that it will suggest the symmetrical whole. We may prefer the richly laden hawthorn, that carries its bloom in such thick heavy clusters; but, remembering that it will not impress itself upon the negative as it does upon the eye and mind, it will be wiser to select smaller tree, with sparser bloom-sprays a little more apart, and surroundings that will not detract from it. Photographically, the result is sure to be far more satisfactory.

Alas! it is in May, the month of flowers, that we have occasion to regret most deeply the colour limitations of our art. Flower form is very beautiful, and can be rendered to perfection, but without colour it is but a beautiful body without a soul. A classical statue of perfect manly beauty is most beautiful, but a living commonplace man is more interesting, after all. We will, doubtless, gain colour life in time; so the photographic Pygmalion will suddenly find his Galatea endowed with life one day. As it is, flowers in a photograph, however well arranged, although well depth and kind of colour may have been translated in shade, have markedly lack of life and soul about them.

But regrettably leaving flowers as beyond our true range, most suitable though they would prove to illustrate the point in favour of suggestiveness and lightness, there are many other things within practicable range that end. May, with every corner full, but not too full, of life, perfect light, and fair weather, offers the best opportunities of the year for the suggestive piece-work advocated. The stile with the path beyond, the half-open door with the sunny scrap seen through, the turn in the lane bend in the river, bit of cathedral cloister, or abbey interior, are all very much to the purpose.

Vignetting and local development are both legitimate means for helping out, by keeping back excess of subject and emphasising particular parts to the concentrating of interest upon the leading thing it is desired to represent. There are accepted means, in rules and lines of composition for doing the same thing in a picture. But it must be remembered that these are ones that the artist has evolved to suit his own special practice. They cannot apply regularly to the very different conditions under which the photographer works. If the artist finds a tree or rock in a scene where they would break upon a leading eye line, and introduce discord and irritation when he would have easy gliding, he can leave them out.

he photographer, short of chopping down the tree or blowing up the rock, has no alternative than to admit them. The one can suppress as he likes in his foreground, and emphasise in his middle distance, the other cannot.

The compensation the photographer has, and which he should not be slow to avail himself of, is the fidelity and ease with which he can reproduce an essential part, and the extreme pleasure which the imagination experiences in working out for itself the full scene. This leaving a space blank is the photographic alternative to the rules of artistic composition when they cannot be applied. Provided the right space be left blank, it will prove more than equally effective. That this is so will be readily admitted by most, if the simple experiment of looking actually, or mentally, over the pictures they have, or remember, be tried, and noting which give them the most pleasure.

One of the chief charms of tele-photography, and one that, apart from its other advantages, points to a lasting adoption, is, that it lends itself and aids this selective faculty. Many a photographer, before the new lens came into use, looking through a telescope in his summer holiday, must have been struck with the charming pictures often seen, and wished they could have been preserved for future consultation, remembrance, and pleasure. May, as the best photographic month of the year, the one for anybody who may elect to start with the new type of work. The conditions are then at their most favourable point, and he will have acquired mastery and confidence in the new field before the less favourable months come in. If, however, so conservative that he will hold to the attempt at a complete picture, let him pay some homage to May by using his largest aperture, giving the shortest exposure, and so on, so as to convey some feeling and suggestion of the sunshine and glad, young freedom of every living and growing thing. Let him not, in the too close fight after the perfection of detail that, however truly present, is ever really noted anywhere but on a photographic plate, make no difference between a sunny day, or month, and a dull, grey one.

SPRING AND SPRING LIGHT.

DURING the past two or three weeks we have received different negatives from correspondents asking the cause of their lack of brilliancy or flat appearance. In every instance the cause has been over-exposure, pure and simple, though the fault has been, in some instances, attributed to the plates. Many amateurs do not appear to realise the difference in the actinic quality of the light now from what it was when they laid aside their cameras last autumn. Just now the light may be said to have reached the zenith of its actinism, and it may be mentioned that, after a May shower has passed, it is more highly actinic than many may suppose, and this should be taken into consideration when making exposures this season.

By the way, referring to spring light, we may again remind our readers, as we have done on many previous occasions, that pictures are to be had now that are not obtainable at any other season of the year; for example, shaded glens, in which it is impossible to obtain detail in the deeper shadows when the foliage is at its full. To take them with leafless trees and shrubs would give the scene a wintry aspect. Again, many buildings and ruins that are surrounded by trees, and are almost, or entirely, hidden when they are in full leaf, may be well shown now, though the trees will not be depicted as leafless, as they would be if the photographs were taken earlier. The trees, while the foliage is light, will not, in most instances, impair the view of the buildings, while they will enhance the beauty of the picture. It is for this reason that we again remind our readers that no time should be lost in securing the pictures. Spring is late this year, but, now that it has commenced, it will proceed rapidly, and we shall probably soon have summer with its foliage, and what is not secured now in spring effects will have to be waited for till next year, a long time to wait to get a picture.

THE NEWCASTLE CONVENTION.

At one of the meetings of the Camera Club in March last, Mr. S. B. Webber, an accomplished goldsmith of long practical experience, kindly gave the members a demonstration of gold working, a brief account of which is printed in this Journal of April 6 last. We understand that Mr. Webber, who is a staunch supporter of the Photographic Convention of the United Kingdom, has been good enough to promise a repetition of this demonstration at the Newcastle meeting of the

Convention in July next. Those intending to be present may rely on having a delightful discourse on some of the properties of the precious metals.

In addition to Mr. Webber's demonstration, the programme as we have already announced will include papers by Sir J. Benjamin Stone, M.P.; Dr. P. H. Emerson, M.A., M.B.; Mr. C. H. Bothamley, (Past President of the Convention), and Mr. J. Bridges Lee, M.A. Photography at the Seat of War, is also expected to prove an attraction at one of the evening meetings.

The Newcastle Meeting of the Convention is the fifteenth of the series. Last year the Council issued a small pamphlet giving a short history of the Convention since its foundation. From that pamphlet we extract the names of some of those gentlemen who, either as Presidents or as readers of papers, have lent their practical support to the Convention during its existence. A study of the appended list will show that, with few exceptions, it includes the names of the men most prominent in British Photography during the last fifteen years.

T. N. Armstrong.	Sir Howard Grubb, F.R.S. (Past F. B. Grundy. [President).
R. Child Bayley.	A. Haddon (Past President).
Thomas Bedding (President, 1900-Gambier Bolton, F.G.S. [1901).	A. L. Henderson.
Thomas Bolas, F.I.C., F.C.S.	A. Horsley Hinton.
C. H. Bothamley, F.I.C., F.C.S. [(Past President).	Messrs. Hurter & Driffield.
F. A. Bridge (Hon. Sec. & Treasurer)	W. Jerome Harrison, F.G.S.
W. K. Burton.	Professor Joly, F.R.S.
Arthur Burchett.	Rev. F. C. Lambert.
William Bedford (Past President).	W. Lang, F.C.S.
F. P. Cembrano (Ex. Hon. Sec. and Past President).	Percy Lund.
William Crooke (Pres. 1899-1900).	Alfred Maskell.
Lyonel Clarke, C.E.	George Mason (Past President).
George Davison (Past President).	Dr. Hill Norris.
T. R. Dallmeyer, F.R.A.S. (President Royal Photographic Soc.).	Andrew Pringle, F.R.M.S. (Past President).
R. P. Drage (Ex Hon. Sec.).	Rev. S. J. Perry, F.R.S.
W. E. Debenham.	H. P. Robinson (Past President).
B. J. Edwards.	Dr. Paul Rudolph (Jena).
E. Howard Farmer.	F. M. Sutcliffe.
J. Guardia.	John Stuart (Past President).
W. Friese-Greene.	J. Traill Taylor (Past President).
William Gamble.	E. J. Wall.
	H. Snowden Ward.

PAPER-MANUFACTURE, WITH SPECIAL REFERENCE TO ITS PHOTOGRAPHIC USES.

[Paper read before the Edinburgh Photographic Society.]

I HAVE been frequently asked by members of this Society and others, What relationship exists between photography and paper-manufacture? For the present I do not intend to answer this question directly, as I hope the result of my remarks this evening will convince all my hearers that without good paper there could be no good photography. One of my questioners, however, would not be put off till this evening, but wanted an explanation at once. I tried to satisfy his curiosity by saying that his prints were made on paper. Yes, he replied, my negatives are made on glass, and yet we don't wish to have a lecture on the manufacture of window glass. The inconsistency of humanity was manifest when my too previous critic frankly admitted that a lecture on the manufacture of celluloid films would be both interesting and instructive.

Photographers should be interested in paper and its manufacture for many reasons, but chiefly because of the necessity for absolute purity, essential to good or even passable, work. If purity and cleanliness are necessary in the processes employed by the photographer, it is equally necessary that the paper to be used for printing purposes shall have been carefully made, so as to ensure absolute purity in the finished article. Besides the paper upon which the photographs are printed, we must not forget that purity is necessary in the mounts, and in the envelopes, tubes, or boxes used for the storing or packing of the papers, plates, and films in the factory, sale-room, or studio.

The principal constituent of a sheet of paper is a somewhat inert body, possessing physical properties indicative of the source from which it has been derived. This substance, known as cellulose, imparts peculiarities to all the numerous varieties of paper, from wrappers through all kinds of news, printings, arts, lithos, writings, to photographic papers, this last class being that to which we shall devote most of our attention to-night.

The materials now used as sources of cellulose for the manufacture of paper are so numerous that it would be hardly possible to enumerate them. But, as we are chiefly concerned at the present time with the manufacture of papers intended to be used for purposes connected with

photography, I shall ask your attention to the three principal sources of fibre used for paper-making in this country and on the Continent. These are:—

1. Rags, including linen and cotton new cuttings, and worn-out garments.
2. Esparto grass (Spanish and African).
3. Wood fibres (commonly called wood pulp).

The methods of reducing these substances to a condition amenable to proper treatment in the various stages through which they must pass in the process of manufacture into finished paper are much the same in the case of rags and esparto grass. In the case of wood cellulose, however, all the preliminary processes have been gone through in mills situated at or near the forests from which the wood is obtained, and the material is supplied to mills in this country in the form of a sheet of pulp. I shall have occasion to return to the subject of wood pulp in papers, but in the mean time let us return to the consideration of the other cellulose-yielding bodies, namely, rags and esparto. We shall run over as rapidly as possible the various stages through which these bodies must pass in the course of their conversion into paper.

The first or preliminary operations are picking, cutting, and dusting. In the case of worn-out garments, all buttons, hooks and eyes, pieces of elastic, or other foreign materials, must be removed. The rags are then put into a duster, willow, or devil, in which they are subjected to a considerable amount of tossing about, with the object of beating out the dust, which falls or is drawn by means of fanners into a dust chamber, the rags being at the same time filled into boxes or sacks, ready to be transferred to the boiler-house. Here the rags are treated with a weak solution of caustic soda in specially constructed boilers; these may be either spherical or cylindrical. The duration of boiling depends upon two factors, namely, quantity of caustic soda used per hundredweight of rags, and pressure of steam per square inch in the boiler. After boiling, the rags receive a thorough washing, are withdrawn from the boiler and transferred to a washing and breaking engine, where the last traces of caustic soda and dirt are removed, while the rags are reduced or torn into very small shreds. In this condition the rags, if necessary, are treated with a small quantity of bleaching solution, for the purpose of removing any colouring matter which may still cling to the fibres. The bleaching agent employed consists of a solution of chloride of lime. It is not desirable that I should enter into the chemistry of this process at the present time, but I wish you to keep in mind that chlorine, in a certain form, has been used for bleaching the fibres. Though chlorine is a very useful substance in the production of paper, it is absolutely necessary that no trace of it shall exist in the finished article, especially if such paper is to be used for any purpose connected with photography. For the present I shall leave this subject, in order to complete the short account of the manufacture of paper; but I shall have occasion to return to it. The rags, after boiling, washing, breaking, and bleaching, are mixed with a large quantity of water, and passed over a suitable machine, called a *presse pâte*, whereby a further removal of dirt is effected, and the rags are obtained in the form of a sheet of what is called "half-stuff." This half-stuff is now placed into an engine provided with a large roll, upon which are fixed a number of knives or blades. As the roll revolves, the blades pass over a number of stationary blades securely fastened to the bed of the engine. The name given to this type of engine is a beater, and the function which it has to perform is implied in the name. The half-stuff is put into the beater with a quantity of water. The rapidity with which the roll revolves causes the pulp to pass between it and the bed plate, and in this manner becomes reduced to its ultimate fibres. All chemicals which it is desirable to retain in the finished paper are inserted here. These include—

1. The colouring materials which it is necessary to add in order to impart the required shade to the paper.

2. Sizing materials, the object of which is to make the paper more or less impervious to water, thus enabling us to write upon paper with ink, or, in the case of photographic papers, to subject the prints to prolonged washing without injury.

3. Filling materials are also added to the beater. These materials may be of mineral origin, as China clay, or any of the numerous forms of precipitated sulphate of lime; or of vegetable origin, as in the case of starch, which is also largely employed as a filling agent. The object of these is to fill up the intervening spaces between the individual fibres, and thus impart to the sheet a more solid surface.

After the fibres have received the necessary amount of beating, and the colouring, sizing, and filling materials have been added, the pulp is run into suitable chests, from which it is pumped as required for final conversion into paper. The paper machine is rather complicated

for description here. The principle involved, however, is simple, depending upon the fact that you cannot cause fibres suspended in water to pass through a sieve. The water itself will run through the meshes of the wire cloth, leaving the fibres behind in the form of a thin sheet. In actual work the pulp, thinned with water, is run on to an endless travelling wire cloth, through which the water passes, leaving the fibres on its surface as a sheet of paper. As the wire cloth travels forward, the sheet of "felts" fibres is induced to leave it, by being made to pass under a roll covered with felt and kept constantly wet. The paper now passes through a number of rolls, each having its own function to perform, and upon their efficiency depend many of the qualities of the finished sheet of paper. After drying, calendering and cutting, each sheet is examined by girls, counted out into quires and reams, ready for the market.

I hope I have made this short account of the methods of paper-manufacture sufficiently clear to my hearers. Although the principles involved are simple, the processes employed are very complex, and a small deviation from the proper treatment in any of these processes has a very decided influence on the finished article. In my description of the manufacture of paper from the raw material I have only referred to rags as the principal source of cellulose. The methods of reducing other fibre-yielding plants are similar to those just described.

Assuming that you have now grasped the essential principles of paper-manufacture, we shall now turn our attention to the subject of paper for photographic purposes, and of the various chemicals used in the manufacture of paper, and which are liable to be retained in the finished paper.

As it will now be evident to all that the manufacture of paper is largely a chemical process, and that the chemicals employed are various, each having its own function to perform, and, having performed that function, it is desirable that any excess should be removed as speedily and as effectually as possible. The permanence of a sheet of paper is undoubtedly dependent upon the care with which all chemicals employed in the transitional stages of the process have been removed from the pulp before it has reached its final stage. At any point of the process it is possible to leave traces behind which, if persisting in the paper, may render the work of the photographer very distressing. There are certain qualities which we, as photographers, are desirous that all paper used by us should possess, such as strength, hardness, and pliability, permanence of colour, and finish. These important qualities, which, from our present point of view, may be considered as essential to good paper, can only be retained if the chemicals employed in the processes already mentioned have been neutralised, and the resulting compounds eliminated from the stock.

Let us now consider in what way residual chemicals in paper may affect photographic work. The first wet process to which the raw paper-making material is subjected is, as we have seen, boiling with caustic soda solution. But, in the manufacture of all ordinary paper, the subsequent processes involve such drastic treatment that it is impossible for any of this chemical to be retained in the paper. In many papers, however, where purity of colour is no object, then the alkali is sometimes not fully eliminated from the stock, and the result is that the paper will contain an amount of soda sufficient to cause harm from a photographic standpoint. Such papers as I am referring to are largely used by the makers of plates and papers for the purpose of wrapping and packing their goods, with the result that, if the alkali comes in contact with silver emulsion, either in plates or papers, a decomposition of silver compounds takes place, with a corresponding degradation in colour. I have often seen printing-out papers (which are usually supplied in cardboard tubes) having a dark border round three sides of the sheet, something like a sheet of mourning notepaper. The edge of the sheet inside the roll is not thus affected—indeed, it will be observed that only those parts of the paper which are in contact with the containing case are thus darkened in colour. If the cardboard or paper of which these tubes are made be carefully examined, it will be found that it is strongly alkaline. Of course we know that, if the instructions of the makers are carried out to the letter (I refer chiefly to the clause, "Keep in a dry place"), such minor calamities may not occur, or they may be encouraged to take place by keeping the tubes in a place which is too dry. This apparent paradox depends upon the hygroscopic property possessed by paper. Assuming that the tubes of printing paper left the maker's premises in an absolutely dry condition, which is not likely, these tubes lie in the dealer's shop in a place which probably contains air having a considerable amount of water vapour. The paper now absorbs moisture from the atmosphere, even to the extent of ten or twelve per cent. The purchaser now may keep his tube of paper in a dry place, with the result that a portion of this moisture is expelled partly into the tube, and during the

process the chemical action already referred to takes place. We know that, tubes and paper are kept constantly dry, such chemical reactions will not take place, but the intermittent absorption and expulsion of moisture causes the residual alkali of the cardboard tubes to act upon the silver or the gelatine of the emulsion. The same remarks apply to the envelopes used for cut papers and for bromide papers. In many cases it would be an advantage if as much care and selection were exercised in the cardboard boxes, envelopes, and wrappers as upon their contents.

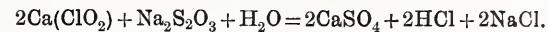
The manufacturer of brown wrappers does not usually anticipate that his paper will be employed for purposes other than are implied by the name, and yet, according to a certain present-day standard of artistic excellence, prints must have the smallest possible amount of detail, of brown tone, and stuck on mounts to match, these mounts being frequently nothing else than a bit of brown paper. Such printing and mounting may look well for a time, but we cannot be surprised if their beauty vanishes, caused by the appearance of yellow spots or other blemishes on the print. These defects could, no doubt, be obviated by the manufacture of a brown paper of the necessary degree of purity; but, if the paper-maker is not duly advised regarding the purposes for which his paper is required, then the photographer will have no cause of complaint against the paper-maker if things do not go as he desires. There is yet another action which brown paper in particular has upon a sensitive emulsion. If brown paper is kept in contact with the emulsion side of a plate or film, an action seems to take place, and a developable effect is obtained. As far as I am aware, it is unknown whether this effect is due to chemical or electrical action. This phenomenon is well worth investigating.

We shall now pass on to other residual chemicals which may possibly exist in the finished paper, and which are, perhaps, of greater interest to the photographer because of their liability to exist in the paper or mounts with which he is in daily contact. The second chemical process to which the paper stock is subjected is bleaching. This process, as I have already stated, consists of the treatment of the "stuff" with a solution of chloride of lime. As it is impossible to obtain perfect bleaching without using an excess of the bleaching agent, there is a possibility that some of this excess may exist in the finished paper. The effect of the existence of an excess of these unstable chlorine compounds in the paper is that they exert a powerful action upon the cellulose, thus causing the paper to lose its strength. The object of treating raw cellulose materials with bleach is to oxidise all non-cellulose matters, converting them from insoluble compounds to soluble substances, which can be easily removed by washing. If this is properly done, the cellulose will not be acted upon by the bleach; but, if too great an excess of bleach has been used, then the cellulose becomes attacked, forming insoluble chlorine substitution compounds, which become fixed upon the weakened fibres, causing degradation of colour and loss of strength. I need not dwell upon the effect which this would have upon paper and mounts used by the photographer. The presence of any unstable compound of chlorine, or even of chlorine itself, in a photographic paper would soon make itself manifest, either in the gelatine or the silver compounds of the emulsion. But the trouble would be much greater if these compounds existed in the paper or the mounts, where the action would be on the finished print, causing loss of its tone, and the production of all shades of yellow spots. Any excess of chlorine, beside acting on the paper, causing a destruction of fibres, would also be liable to attack the iron of the drying cylinders on the machine, thus allowing iron compounds to penetrate the paper, producing what are commonly known as "rust spots" or "specks."

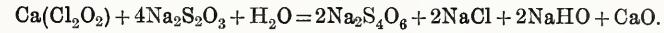
As we are all aware that any unstable compound of chlorine, existing either in paper or mounts, will sooner or later have a very detrimental effect on our photographic work, it is evident that the paper-maker must do his best to remove these last traces. There are two methods whereby this may be accomplished. These are: (1) Washing out the chlorine compounds with water; and (2) the addition of a substance which will neutralise the activity of the chlorine. The former method is undoubtedly the best, but would require a water supply such as no paper-maker dare even dream of. The latter method is therefore the only remedy which can be employed in daily work. The substances used for the purpose of counteracting the evil effect of chlorine are called "antichlors." Several antichlors may be used, the most common being hyposulphite of soda, sulphite of soda, pentasulphide of lime, and ammonia. I have mentioned them in the order in which they are most commonly employed by paper-makers, the first place being given to the photographer's great friend and enemy. The second on the list is also a powerful photographic chemical, though we cannot say that its presence has any harmful effect as possessed by hyposulphite of soda. Indeed, sulphite of soda is employed in photographic preparations solely to

prevent oxidation of other chemicals. Of the other antichlors mentioned, pentasulphide of lime and ammonia, the former is never employed in good papers; but, as I have already mentioned, some photographers like to choose their own mount, even though that mount be a sheet of brown paper. Such aesthetic taste may yet receive a sudden check by the discovery of the evolution of sulphuretted hydrogen between the aesthetic mount and the aesthetic frame which support and surround the aesthetic picture. I may say in passing that I have had some not altogether pleasant acquaintance with this antichlor. The last antichlor which I mentioned was ammonia, and, if it alone were used, the photographer would have no cause for complaint against the paper-maker. Why is it not employed?—(1) Smell; (2) cost—both of which reasons are prohibitive.

For the present we will turn our attention to hyposulphite of soda when used as an antichlor. If this substance is used in excess for papers which may be used in any photographic process, we must certainly be prepared for trouble. Hypo is the most powerful chemical which the photographer has to employ. If it exists in his dishes or on his fingers, stains will inevitably be produced on his prints or negatives. Hypo destroys the value of all other photographic solutions into which it finds its way. It is always used as a final solution in the treatment of photographic prints, and, if not thoroughly removed by washing, invariably causes the prints to fade or become discoloured. When using hypo as an antichlor, the calcium hypochlorite remaining in the pulp is decomposed, with the formation of more stable salts, such as calcium sulphate, sodium chloride, and hydrochloric acid.



If the water in which the pulp is suspended only contains a very small trace of chlorine compounds, then the decomposition may take place with the formation of sodium tetrathionate, sodium chloride, caustic soda and lime.



The first reaction is the principal one. The presence of hydrochloric acid as a product of the decomposition is in itself a source of considerable trouble for the photographer, even when there is no free hypo.

As the last process to which a photographic print is subjected is a bath of hypo followed by prolonged washing, it will be evident that, if the presence of hypo, or any of the products of its decomposition, were present in the paper, they will now be removed, and all tendency to further damage will cease. Hyposulphite of soda employed as an antichlor, and an excess remaining in the finished paper, may spoil the silver emulsion but it will not spoil the print after fixing and washing. Not so, however, with the mount, for the print will now be brought into contact with a paper which is liable to contain an excess of hyposulphite of soda or the products of its decomposition. In which case these, if present in any appreciable quantities, will cause the appearance of spots on the print, possibly accompanied by a general fading or degradation of tone. If, then, the presence of hyposulphite of soda can cause serious results, either in the paper or mounts, it is most desirable that the photographer should know how to detect their presence. A simple and efficient test easily carried out by any photographer, even without a special knowledge of chemistry, is to take a quantity of the suspected paper, boil with distilled water, and, after evaporating to convenient bulk, add a few drops of a solution of silver nitrate. If excess of hyposulphite is present, a brown colouration or brownish-black precipitate will be produced, the absence of which may at the same time be taken as conclusive evidence that excess of hyposulphite is not present in dangerous quantity.

There is still another substance which may be present in paper, and which acts injuriously upon a photographic print. This is ultramarine, used as a colouring agent, and very largely used by paper-makers. Ultramarine is a very complex body, and, if treated with alum or any acid substance, loses its blue colour, accompanied by the evolution of sulphuretted hydrogen. Ultramarine is occasionally present in the paper of mounts, and, as the mountant employed is frequently acid, this decomposition will take place, and the sulphur compounds thus liberated will almost certainly attack the silver of the print, producing yellow spots or other discolouration. A recognised test for the presence of ultramarine in the paper of the mount is to add a small quantity of acetic acid to the mountant, and paste a silver print upon the suspected mount. If ultramarine is present in injurious quantity, yellow spots will appear on the prints in the course of two or three days. You will, no doubt, observe that I have only referred to the mount as liable to contain ultramarine as a colouring matter, because a paper which has been manufactured for photographic printing is always coloured with cobalt blue or smalt, which is not acted upon by acid bodies. Of course, if a photographer

wishes to use a paper which has not been made for photographic purposes, then he must first of all determine for himself whether the colour of the paper will remain fast, after being subjected to treatment with dilute acid.

I fear I have only done scant justice to my self-imposed task, because so much can be said on the subject of photographic paper and mounts. Photographers may, with benefit to themselves, give a little consideration to the subject of the paper upon which their prints are made, as it is of great interest to them. It is, no doubt, astonishing that, with all the processes, both chemical and mechanical, through which cellulose must pass before it can be formed into a sheet of paper of sufficient purity to meet the demands of the great army of users of photographic papers. Paper-makers of all countries have spent much time and money upon the production of a paper possessing all necessary requirements ; but the difficulties of making a paper chemically pure, regular in thickness and weight, with suitable surface, were so difficult that most mills gave up the matter. The qualities required in a photographic paper can only be obtained by using the very best and carefully sorted linen rags, perfectly pure and free from iron or other substances which might cause spots to appear in the paper afterwards. It must be most carefully sized, so as to enable it to resist the softening action of the several baths to which it will be subjected. The surface must be even ; all sorts of marks, specks, or pinholes, must be absent. Speaking universally, the paper trade has scored one of its greatest successes in the production of a paper which may be considered as practically faultless, for photography requires a paper which possesses only good qualities and no bad ones. There is, however, one great cause for regret, namely, that the British paper-makers have not been able to supply the demand, so that the photographer must go the Continent for his paper. The reason is, not that the British paper-maker cannot manufacture a paper possessing these necessary qualities, but rather because the photographer can get a thoroughly good paper abroad ; he does not care to try experiments on a paper which may or may not meet his requirements.

J. EDINGTON AITKEN.

FOREIGN NEWS AND NOTES.

Photography with a Fly's Eye.—Particulars of an interesting experiment are given in the German periodical, *Mutter Erde*. The eye of the fly is of a composite nature, and consists of some 8000 lenses ; but each of these only forms an image of a point perpendicular to the facet constituting the lens. The pictures upon the retina of a fly therefore resemble a mosaic. As the facets are in different planes, and are of various sizes and shapes, they do not all correspond in focus, and it is thus possible for the fly to see objects at various distances, although its visual organs have no power of accommodation. It is no easy task to mount a fly's eye suitably for photographic purposes upon a metal plate without injuring its form or structure ; but, after many failures, satisfactory results were secured. It was found that 20 cm. between object and lens gave the sharpest results, and that the definition was more or less impaired at other distances ; but negatives of bright objects, such as street lamps, the brilliant reflections of water, &c., were obtained up to a distance of 8 metres. To obviate the difficulties presented by the short extension of an ordinary camera and dark slides, a tubular camera, about one metre in length, was tried, but the intensity of the image was so much reduced, that three hours' exposure was necessary to obtain a passable negative.

The Vienna Technical School and the Paris Exhibition.—We learn from the *Photographische Chronik* that the exhibit of the Vienna Technical School will be of the most interesting kind. Among other novelties an improved process of printing in natural colours will be shown. This process is a modification of the three-colour printing process, but the greys, the deepest tones and shadows, are reproduced by a fourth printing by photogravure. The result obtained at the first trial of the process was so successful that it will be included in the exhibit. This work is a copy of H. Bartel's *Youth and Old Age*, and is said to be exceptionally perfect in its gradation and true rendering of the colours. Numerous other specimens by the same process, representing works by Alma-Tadema, Blaas, Darnaut, Schäffer, Pettenkofen, &c., will also be exhibited. It seems probable that this process will take premier rank for copying works of art. The exhibit will also include specimens by a number of other printing processes, such as photogravure, photogravure in colours, collotype, combined collotype and lithographic

printing, collotype from aluminium plates, process work, &c. Pure photography in portraiture and landscape will also be shown in its numerous printing processes from albumen to gum-bichromate. The services of photography to science will also be represented by micro-photographs, spectrum photographs, radiographs, &c.

A Test for Gilt Edges and Lettering.—The *Photographische Chronik* recommends the following test: Remove any trace of grease from the stamping, lettering, or gilt edges to be tested, and apply a few drops of a ten per cent. solution of nitrate of silver. Real gold will not tarnish, but ordinary bronze and gold of very inferior quality (8 carat) will turn grey.

Purifying Gelatine.—The *Journal de la Société Chimique* recommends that gelatine should be purified by treatment with successive baths of water, diluted solution of potash, diluted acetic acid, water, and, finally, alcohol. Most of the mineral impurities will thus be eliminated. The gelatine should then be dissolved in warm water, filtered, precipitated with alcohol, dried, pulverised, and treated with ether. In this way the mineral constituents may be reduced in certain cases to twenty-five per cent., and the sulphur compounds to two per cent., of their original quantities.

Discoloured Platinum Prints.—The imperfect elimination of the iron salts from platinum prints causes the paper to turn yellow in the course of time, and Herr Gaedicke recommends a bath of 15 grammes of soda and 20 grammes of chloride of lime dissolved in 200 c.c. of water as a bleaching agent. By a curious mistake chloride of calcium was printed originally instead of chloride of lime, and, as Herr Gaedicke remarks, it would have saved some trouble if a handful of salt had been taken instead. Such a solution is quite useless for the purpose. A solution of soda and chloride of lime will precipitate carbonate of calcium, but the supernatant fluid is a powerful bleaching agent.

The Studio Roof.—The *Camera Obscura* contains an article upon this subject from the pen of Herr Alfred Parz-r-Mühlbacher. To those who think of building their own studios he recommends the use of good ordinary window glass, and, as it is generally slightly curved, care should be taken in glazing that the curves are in the same direction, preferably with the concave side upwards. If T iron is used for the rafters, there is great advantage in using the pattern with underneath channels, as it carries off any excessive condensation of moisture or drip. The durability of a roof depends largely upon the material used for fixing the glass in position. Changes in temperature cause unequal expansion of the glass and rafters, and the desideratum is a putty that combines sufficient elasticity and adhesiveness to keep the joints water-tight. The best putty is stiff and dries yellowish. If soft and white, it should not be used for the purpose. The following is recommended as an excellent composition instead of putty. Tear ordinary newspaper into small pieces, place it in an enamelled vessel and cover it with caustic potash lees. Boil it and add with constant stirring one-third the quantity of turpentine. Thoroughly mix and keep the solution hot ; then add the following ingredients, which must also be dissolved in boiling turpentine :—

Ordinary pitch	10	parts.
Resin	3	"
Gutta percha	10	"
Wood tar	2½	"

The solution should be well stirred and boiled till it becomes a stiff paste, and should be used whilst still warm. The composition may be good ; but we should advise considerable care in its preparation, as it must be highly inflammable.

SHIELDING.

THE many advantages that can be conferred by the simple operation of shielding are seldom thought of by those who at times are face to face with difficulties in photography. Speaking generally, most workers look upon a shielding operation as one more particularly connected with the printing of negatives, and seldom or never realise that in many other ways it proves of great value in producing results otherwise impossible of attainment without having recourse to its aid.

In the exposing of a sensitive plate even, many instances will be found in which, were it not for the simple operation of shielding, nothing like successful results could be obtained, and this applies not merely to a certain class of outside subjects, but to a large number of indoor operations as well. A striking example of the latter class of subjects may be given as showing what can be done by merely shielding a sensitive plate during exposure. The writer some little time ago was asked for his advice *re* the photographing of what undoubtedly appeared a difficult subject to reproduce by means of photography and half-tone process blocks. The subject in question was an oil painting possessing a charming sky effect of great delicacy, linked to a distinctly difficult tone of colour forming the rest of the picture, and the problem to solve was how to photograph the painting so as to retain the delicacy of the sky and at the same time bring out the detail in the darkest parts of the foreground. Several attempts had been made by different makers of plates, and quite a number of exposures given with the view of ascertaining what yielded the best results, the outcome of which showed that, whenever a sufficiency of time had been allowed to bring out the detail in the darkest portions, the sky became hopelessly clogged up, and, when exposure was made to suit the latter, the former was much undertimed. In addition to isochromatic plates, various coloured screens were tried at the back and front and between the lens, but without success, and on studying the painting the writer immediately suggested that the only means of accomplishing the feat was to resort to an operation of shielding, and on making such a suggestion he was informed that such had been already attempted without success. On making further inquiries as to how the shielding had been conducted, it soon became evident that an error had been committed even in this apparently simple operation, and this proves that there is even in shielding a good deal to be learned by those not possessed of much photographic experience.

In this case the failure was clearly attributable to the employment of a wrong shield. Now, many may imagine that the introduction of an opaque shield between an object that is being photographed and a sensitive plate can only have one effect, viz., the prevention of light reaching the plate; but this is clearly an error, as was proved by old collodion-workers forty years ago, when it was fully recognised by photographers that there was such a thing as at that time was termed auxiliary illumination, and this fact was actually used to advantage when very dark portions of an object had to be photographed simultaneously with lighter parts of the same subjects. At that time it was not uncommon to introduce white shields between the lens and the darkest portions of the object being photographed, the result of the introductions of such light-coloured shields being a distinct gain in the reduction on the sensitive plate where such dark objects should appear; this simple operation can be tried by any reader, and will be found to yield surprising results. It therefore follows that some consideration must be bestowed upon the colour of the shields employed whenever this operation is being resorted to.

In the case of the oil painting already mentioned a white opaque shield was the worst possible medium to employ, simply by reason that the white colour acted as an auxiliary illuminant, taking practically the place in a slightly lesser degree than the white sky of the painting, and, of course, yielding an out-of-focus, fuzzy effect.

The exposure that was found necessary to bring out the darkest parts of the picture was nearly four times that required for the cloud effect in the sky, and this difficulty was eventually overcome by the use of a transparent screen or glass shield wafted continually at a distance of about five or six inches in front of the lens in such a position as tended to intercept the pencils of reflected light emanating from the sky portion of the painting.

On development, the first plate exposed under such treatment yielded a perfect result, and from which a satisfactory half-tone block was produced.

It stands to reason that some consideration must be bestowed upon the colour of the transparent shields employed. The colour selected for this particular subject was signal green, and the plates used were isochromatics of medium speed, the lens being fitted with various coloured screens inserted between the combinations. These, of course, increased the time of exposure, which was over an hour.

The photographing of oil paintings requires a good deal of thought so as to render correctly the various colour values. It may be taken for granted, however, that judicious shielding of difficult portions plays a most important part when dealing with such subjects, and opaque shields are not by any means as serviceable as coloured transparent mediums. What the colour should be, or density of the same, is a matter that can only be left to the judgment and experience of an operator.

The advantages of sky shades or shields in outdoor work was more appreciated years ago than at the present day. Doubtless, the extreme sensitiveness of plates that are now in use makes their employment less practicable than was the case even twenty years ago; but it cannot be said that the bulk of the work shown as the result of rapid exposures is any better than was produced by even a dry plate, such as Wratten & Wainwright's splendid slow plate of about 12 sensitometer yielded when used in conjunction with a shield, a striking example of which may be mentioned as designed by Mr. Charles Parker, and drawings of which were given in THE BRITISH JOURNAL OF PHOTOGRAPHY under date

November 9, 1883. As I write, examples produced by means of this simple little instrument lie before me, and they are charming.

Shielding, however, may be said to enter into every branch of photography, in none of which, perhaps, does it prove more efficient than in daylight enlarging. Here it will, when judiciously employed, work wonders, for thin portions of a negative are, with the greatest ease, kept back until the denser portions of a negative are brought out.

As a rule, this class of enlarging is generally conducted in rooms having an abundance of space, and it is quite a luxury for an operator to be able to move comfortably about between the easel and lens, and carefully scan the projected picture on the easel, seeing where the slightest improvement could be effected by merely wafting, in some instances, his finger across the denser part. In conducting this same work by means of artificial light the same thing holds good; in fact, some negatives could never be made to yield passable results were it not for shielding some parts of them.

In the making of lantern slides we find another fruitful source of improvement by means of shielding, both when making slides by contact and the more perfect method of reduction by through the camera.

Innumerable instances will be found, when making slides through the camera, that merely wafting a piece of cardboard in front of the ground glass that is interposed between the light and the negative will give very superior results to when such wafting was not conducted, and there are very many instances, especially with negatives that have been produced by rapid-shutter exposures, in which it would be next to impossible to make lantern slides from at all were it not for having resort to a suitable method of shielding. An example may be mentioned such as is quite common when, say, a paddle steamer has been photographed whilst going at full speed. In subjects of this kind the water is always represented as of much greater density, by reason of the churning into a white foam of the same, than the other parts of the picture, such as the hull, and, without shielding off the entire parts of the negative that does not contain the water until such time as the white water is exposed fully up, no passable result can be produced.

In a case of this kind a useful plan to follow is to first pull off a silver print, and cut out, slightly within the water run, the portions of the print showing the white water. This cut-out shield is then fastened to a sheet of glass the same size as the negative, and, by means of studs, is placed in front of the negative for the necessary time required to print up the water; it is then removed, and the rest of the negative exposed. This is a most important factor in lantern-slide making, and is the only means whereby some difficult printing negatives can be made to yield anything like pleasing results.

In copying, again, it will often be found that it is only by shielding some parts that any good can be done, and it is well to bear in mind, when intercepting any shield between a lens and an object, especially at any distance from the lens, that a white shield will affect the plate somewhat; therefore attention must be given to the colour of the shield employed.

A. T. NEWTON.

THORNTON'S IMPROVEMENTS IN CAMERAS.

[Patent No. 6754 of 1899.]

MR. THORNTON says: All the rigid parts of the camera I make from aluminium sheets stamped out by a press or other means to the desired shapes. Thus the body or case, *a*, the front or lid, *b*, the lens-carrier or support, *c*, are all stamped from or made of sheet aluminium, *a*.

The aluminium sheet is rolled or formed in the usual way, and is preferably on one surface, printed, coated, or enamelled with a covering composition, *b*, to exactly represent in appearance mahogany or other wood. It is then stamped to the desired shapes for the different parts of the camera, and the blank is covered on the plain side with leather paper cloth or similar flexible material, *c*. The cover leather paper or cloth, *c*, is cut a little larger than the corresponding aluminium metal blank, the edges, *d*, of the cover extending or overhanging beyond the edges of the blank all round.

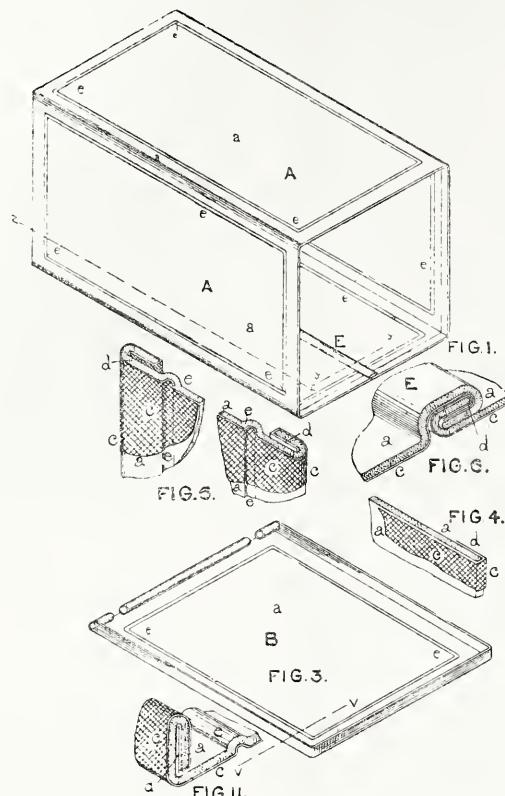
The flexible covering, *c*, is secured to the aluminium blank, *a*, by any suitable adhesive material applied all over the surface or to the edges only as desired. The overhanging edges, *d*, of the flexible covering, *c*, are turned over on to the opposite side of the aluminium blank, *a*, as shown in fig. 4.

The edges of the covered aluminium blank, *a*, are next turned over upon themselves and upon the flexible cover, *c*, to produce a rim of double thickness, along each edge, for the purpose of giving stiffness and rigidity to the article. By this construction comparatively thin aluminium sheet can be used whilst obtaining great strength and rigidity at the edges.

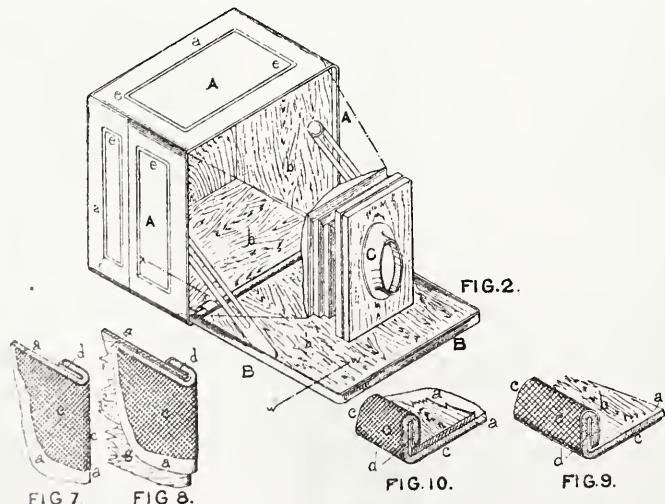
The flexible cover, *c*, of leather or other material is by the same operation turned over into the interior, and is there gripped between the two surfaces of the aluminium. It thereby presents a complete cover or finish to the edges and is also perfectly secured in position. Paste or adhesive material may in some cases be dispensed with between the cover, *c*, and the aluminium, *a*, the cover being alone secured by the gripping of its overhanging and overturned edges, *d*, by the metal.

The turning over of the aluminium, *a*, and cover, *c*, together, to stiffen the edges, stretches the leather tightly on the metal and presents a very good finish.

In this way an aluminium blank, *a*, has been formed covered with leather or other flexible material, *c*, preferably manufactured to resemble or look like leather, and it is now only necessary to shape or bend this into proper form for the various parts of the camera, and to secure the joints finely together to complete the finished article.



This operation is done by the aid of formers, dies, jigs, or other suitable means, such as are well known and understood. The jointing may be done in various ways according to the shape of the blank and of the finished article. For instance, in making a camera body of elongated box form open at the two ends, as in fig. 1, the join or seam, *E*, would be produced either by hooking the adjacent edges into each other and then clinching them together, or a lap joint riveted, screwed, or other-



wise secured, may be used instead. These ordinary methods are well understood.

The box, or other article, is afterwards ornamented at the corners, joints, and other desired places, by heated press tools or other convenient means.

In order to stiffen the body, *A*, baseboard, *B*, front, *c*, box, or other part of a camera, I form indented or raised stiffening ribs, *e*, by pressing

in suitable dies. This may be done either before or after the metal has been bent into shape.

In some styles of camera it is desirable to make certain parts, such as the inside of the body, *A*, the inside of the baseboard, *B*, and the front or lens-carrier, *c*, look like polished mahogany. This may be done by printing, enamelling, or colouring the surface of the metal, or by covering same with paper or other similar flexible material made to imitate or resemble the grain of the mahogany, or by covering with or inserting a thin veneer, *g*, or layer of polished mahogany or other ornamental wood, as in figs. 8 and 10.

The enamel or printing will preferably be applied to the aluminium sheets before being cut or shaped, but, if so desired, may be after being cut or shaped.

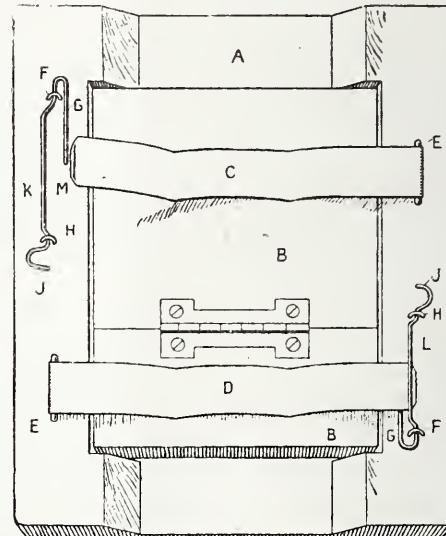
The metal being first leather-covered, the finished effect will be that of a piece of polished mahogany covered with leather on the opposite side, and having a narrow border of leather round the edges of the polished sides. If desired that the turned-over edges shall be flush with the polished surface of the veneer, the latter may be rabbeted round the edges for metal to fit into. The whole is clenched in a press to complete. It produces a cheap and yet first-class finished result, and warping and bending is entirely prevented.

HUDSON'S PRINTING FRAME.

[Patent No. 25,657 of 1899.]

INSTEAD of looping the two ends of the swivel round the eye or small staple, which secures it to the side of the printing frame, the inventors make the swivel at one end with a bend, and pass it through the staple or eye, then we further bend the extremity in the form of an elongated U with the other portion of the swivel, bringing it to project under the bent lip of the flexible metal strap. At its other extremity the swivel is bent to pass through the staple or eye, and is then curved round into a loop or bend, so as to be capable of being manipulated by thumb pressure, as hereinafter explained, for releasing the strap.

When the swivel lies flat against the side of the frame in its inoperative position, its bent limb, which forms the U portion, stands up somewhat, and in such a manner that, when the flexible metal strap is pressed down, it forces the bent limb or U portion of the swivel down-



wards, which operation thereby raises the swivel portion, and brings it over the lip formed at the extremity of the flexible metal strap, securing or fastening the same in position automatically, or at one operation.

To release the strap, the loop or thumb portion at the opposite end of the swivel is pressed back, which disengages the same from the lip formed on the strap, and allows the latter to spring or fly back.

A is the photographic printing frame; *B* its back, which is secured in position by the flexible metal straps, *C* and *D*, pivoted at the respective sides of the frame, as shown at *E*.

Two of the new form of swivel, *K* and *L*, are represented for securing the ends respectively of the two flexible metal straps, *C* and *D*. These swivels, at the outer end of the frame, after passing through the eye or staple, *H*, are bent into a projecting limb, *G*, which forms with the swivel a kind of elongated U. When the swivel lies flat against the side of the frame, this limb projects upwards somewhat. At their other ends the swivels are bent and passed through the eye or staple, *H*, and then curved or curled to a suitable shape to admit of thumb pressure, as shown at *J*.

The swivel, *K*, is shown in its inoperative position, whilst, on the contrary, the flexible strap, *D*, is represented as being secured by the swivel, *L*.

When the end of the flexible strap, c, is pressed down, it forces down limb, g, of the swivel, x, and thereby brings the latter over the lip, m, of the flexible strap, c, which thereby becomes secured in position in an exactly similar manner, as shown by the strap, d.

The flexible straps, c and d, are instantly released by thumb pressure on their curled ends, j, which action causes the flexible straps to spring or fly back, and the back, b, may then be removed, and also, if need be, the picture.

THE FORTHCOMING EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

The Forty-fifth Annual Exhibition of the Royal Photographic Society will be held at the New Gallery, 121, Regent-street, London, W., from October 1 to November 3, next. The Exhibition will be divided into five sections, namely: I. Selected pictorial photographs; II. General professional work; III. Photographic apparatus and material; IV. Photo-mechanical processes of reproduction; V. Scientific photography and photography in its technical applications. We subjoin extracts from the prospectus relating to the manner in which it is proposed to administer these sections:

SECTION I.

Selected Pictorial Photographs.

The West Gallery will be set apart for this section. The same general lines which have characterised the Pictorial Section of the Society's previous Annual Exhibition, will be followed. Portraiture, landscape, architecture, figure studies, exterior and interior work, stereoscopic prints and transparencies, lantern slides, &c., by any process, will be included, and both competitive and non-competitive work will be admitted.

Medals will be placed at the disposal of the Judges. No exhibit will be eligible for an award unless, with the exception of mounting and framing, it is entirely the work of the exhibitor.

Lantern slides will not be eligible for an award unless both the negatives and slides are entirely the work of the exhibitor. If an award be made, it will be to an individual slide.

SECTION II.

General Professional Work.

The North Gallery will be set apart for a non-competitive Exhibition of general professional work, including portraiture, figure studies and groups, landscapes, architectural and engineering photographs, exterior and interior work, &c. No restrictions are imposed as to date of production, or as to the previous exhibition of work for this section.

The Section will be under the management of the Organizing Committee. Although it is wished, in this section, to allow the utmost latitude, the right is reserved to reject any work that is considered to be unsuitable.

Allotment of space and charges.—Two methods will be adopted:—

(A). Space will be let to exhibitors who wish to make a collective exhibit of their work. They may arrange and hang it themselves, or, at their request, it will be arranged and hung by the Committee. Drapery and other decoration will be allowed; but the scheme of decoration proposed to be adopted must be submitted to, and approved by, the Committee. Space will be charged for at the rate of 5s. per foot linear, payable on allotment. The Committee do not bind themselves to allot any particular position, but will duly consider priority of application in their decision. Application for space (specifying the amount required) must be made by letter, addressed to the Secretary of the Society, on or before Saturday, July 21. A plan of the North Gallery can be obtained on application to the Secretary.

SECTION III.

Photographic Apparatus and Material.

The Central Hall and South Gallery will be devoted to an exhibition of photographic apparatus and material of every description used in photography. The exhibits will be divided into two sub-sections—competitive and non-competitive. Apparatus entered in the competitive sub-section may also be exhibited in duplicate in the non-competitive section.

(A). Competitive.—The competitive exhibits will be displayed in the South Gallery, and will be dealt with by the Technical Selecting Committee. No apparatus that has been shown at any previous Annual Exhibition of the Society will be eligible for admission unless it possesses some new feature, which must be specified on the entry form. All exhibits must be concisely described, and any that have been already shown at a London exhibition may be refused. Every exhibit will be catalogued, and, where it is considered desirable, described and illustrated. Pulls of blocks illustrating such exhibits, which may be available, should accompany the entry form. A removable label must be attached to each exhibit, bearing the name of the exhibitor and the number to which it refers in the entry form. During the Exhibition the exhibits will be under the supervision of an attendant provided by the Society.

(B). Non-competitive.—The non-competitive exhibits will be under the management of the Organizing Committee, and will be shown in the Central Hall. The exhibits in this sub-section will not be catalogued. The Committee have set apart certain space which will be let for the erection of stalls, and applications for space, which must be made by letter, addressed to the Secretary, on or before Saturday, July 21, will be

considered in order of priority of application. Stall-holders will have to provide their own tables, stands, counters, show-cases, &c., and all structures, displayed signs, notice boards, &c., will be subject to the approval of the Committee. Attendants, if necessary, must be provided by the exhibitors. Orders for goods may be taken at the stalls, but no delivery at the Exhibition will be allowed. Catalogues, circulars, and price-lists may only be distributed from the stalls. Any special lighting of stalls required will be arranged for where possible, at the exhibitor's expense. No exhibitor will be permitted to transfer or sub-let any part of the space allotted to him, and no substance of a dangerous or explosive nature will be allowed in or on any such space.

SECTION IV.

Photo-mechanical Processes.

This Section will include all exhibits relating to or illustrating any process of photo-mechanical reproduction, viz., photogravure, line and half-tone photo-engraving, photo-lithography, collotype, photo-zincography, Woodburytype, polychromatic printing, &c.

Medals will be placed at the disposal of the Judges, but non-competitive work will be admitted.

SECTION V.

Scientific Photography and Photography in its Technical Applications.

This Section will comprise examples of work shown for its technical qualities, and apparatus used in photographic investigations: The various processes of colour photography, the photographic reproduction of paintings, drawings, maps and plans, photographs by artificial light, photography applied to industrial and educational purposes, astronomy, spectroscopy, geology, meteorology, microscopy, medicine, surgery and the Röntgen rays, surveying and engineering, zoology and botany, tele-photography, new processes, enlargements, photography applied to military purposes, recording instruments, &c., negatives, transparencies, stereoscopic prints and slides, lantern slides, and general work.

Exhibits may be excluded unless the points of special technical or scientific interest are distinctly stated.

Medals will be placed at the disposal of the Judges, but non-competitive work will be admitted.

THE NATIONAL PHOTOGRAPHIC EXHIBITION.

The Second National Photographic Exhibition, under the management of Mr. A. C. Brookes, opened at the Portman Rooms, Baker-street, on April 27, and closes to-morrow, Saturday, May 5. Music, lectures, and cinematograph exhibitions were provided for the entertainment of visitors for whose information and instruction in the more serious subject of photography about sixty firms had taken the opportunity of making a display of their specialities in apparatus and material. Compared with its predecessor of two years ago, the present Exhibition is decidedly larger, while it is more varied in nature, inasmuch as the element of manipulative photography is stronger, more than one firm giving practical demonstrations in the working of their printing papers, &c.

It would be absurd to pretend that the present Exhibition is the means of introducing any startling novelty to the photographic world, but of its comprehensive usefulness there can be no question. We go the length of saying that nobody interested in photography could fail to profit by an afternoon passed in examining the rich collection of photographic apparatus, &c., now to be seen in the Portman Rooms. Manufacturers and dealers may inspect the newest productions of their competitors; professional and amateur photographers can gratify their individual predilections by the careful scrutiny of the very latest efforts of those business houses whose aim it is to cater for the ever-increasing number of photographers.

When all is said and done, this is, or at any rate should be, the prime aim of such an Exhibition, and we are bound to say that the Portman Rooms display amply achieves that aim.

A detailed notice of the Exhibition would read very like a dealer's catalogue with a few adjectives thrown in, a literary production that is a weariness to the flesh of all concerned. We must therefore content ourselves by merely giving a list of the principal exhibitors and an indication of the dominant features of their displays. The Editorial Table pages of this JOURNAL for months past, and the "Novelties in Apparatus Section" of our 1900 ALMANAC have contained full descriptions of the newest introductions in photographic apparatus, &c., as they have appeared, so that on the present occasion we are absolved from going over the ground again.

We may say, however, that we have notes of several of the season's novelties that are being put forward by some of the exhibitors, and to these we shall devote separate references in our pages as occasion offers.

Amongst the exhibitors are Messrs. Seabrook, Bros., & Co., who have a good collection of the Manhattan Optical Company's Wizard Cameras on a tastefully decorated stall; Messrs. T. Illingworth & Co., who are to the fore with some capital carbon and bromide enlargements and a stand of apparatus; Mr. Frederick Boehm, who has a stand well filled with the chemical specialities of E. Merck and other houses; Messrs. F. H. Taylor & Co. (bottles and measures); J. Lancaster & Son, with many

new designs of cameras, &c.; Marion & Co., who show an admirable collection of prints on Mariona papers of various kinds, bromide papers, quick-print papers, demonstrate the toning of P.O.P. papers and development of quick-print papers, and have a very large stand stocked with an immense variety of apparatus; H. F. Purser, whose exhibit consists of the Busch aplanats and other lenses; The Thornton-Pickard Manufacturing Co., Ltd., whose well-known shutters and cameras give opportunity for a well-arranged exhibit; The Photo-chromoscope Syndicate; Butcher & Son (a large stand loaded with apparatus appealing to amateurs); David Allan, with a capital collection of print-washers, &c., and dark-room furniture; George Houghton & Son, whose stand is one of the most crowded and artistically arranged in the room; William Tylar, with novelties in the shape of the Dreadnought acetylene generator, and a new acetylene gas-jet; Secco films; The Warwick Trading Co.; The Columbia Optical and Camera Co.; Morgan & Kidd, with beautiful specimens of printing and enlarging on their bromide papers; enlargements by the bromide, carbon, and platinotype processes; photo enamels, collotype printing, and half-tone process blocks; C. P. Goerz; Rogers & Webster, with specimens of artistic picture frames for photographs; Harrington Bros., chemicals; J. Lizars; Joseph Levi & Co.; O. Sichel & Co.; J. J. Griffin & Son, Ltd.; L. Gau-mont & Cie.; R. W. Thomas & Co., Ltd.; W. H. Assender & Co., Ltd.; Prestwich Manufacturing Co.; &c.

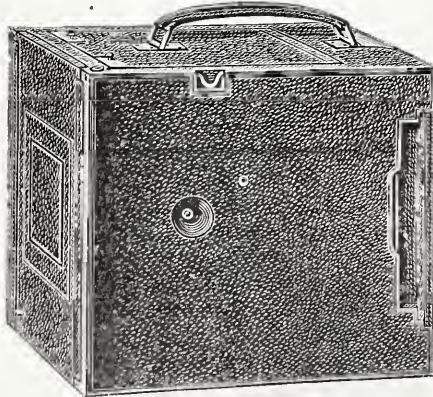
The Exhibition, which we trust to hear has been successful, is open today and to-morrow from 12 to 10, and we recommend our readers to pay it a visit. It is compactly arranged in a suite of rooms not too large for the purpose; and the person interested in photography who could not derive some knowledge or benefit from an hour or two passed in studying the varied contents of the stands must be a hopelessly dull individual. The greatest credit is due to Mr. A. C. Brookes for his work of organization.

Our Editorial Table.

THE ADAMS REFLEX HAND CAMERA.

Manufactured and sold by Adams & Co., 26, Charing Cross-road, W.C.

In March last some correspondence appeared in our pages on the subject of reflector hand cameras, several readers ventilating their ideas with respect to their requirements in the matter. The attention thus directed to the peculiar characteristics of this class of instrument invests the introduction upon the market of the camera now under notice with considerable interest. Without going so far as to say that in the Adams Reflex Hand Camera all tastes and idiosyncrasies are anticipated—a “large order” somewhat difficult of execution—we may yet allow ourselves to remark that a careful examination of the camera leaves us in doubt as to whether it omits the inclusion of any feature desirable in an instrument showing a full “sized finder image,” while we should be just



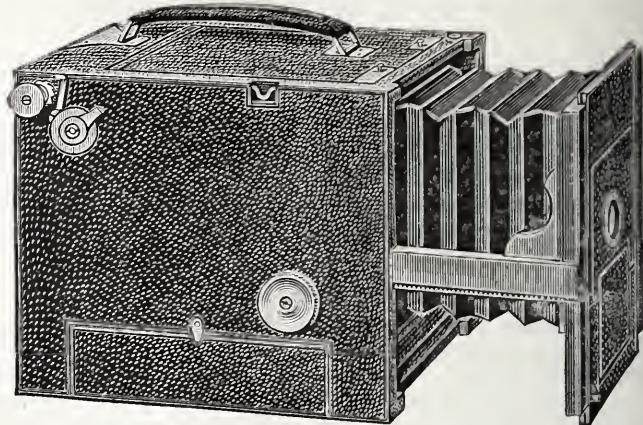
as much puzzled to suggest any respect in which the vital movements of the camera could be improved upon so as to afford the acme of convenience to the photographer with the minimum amount of mechanical outlay.

The Adams Reflex Hand Camera takes 5×4 pictures, and only measures 9 in. × 8½ × 6½, with a weight of 6½ lbs. The illustrations respectively show the camera entirely closed; extended for long-focus work, and with the funnel-shaped hood, 6½ inches high, opened for allowing of an examination of the finder image. The lens aperture is entirely controlled from the front of the camera, a small board being let down to allow of the diaphragm being revolved in accordance with an engraved scale. A focal range of from 6½ to about 13 inches is given by the camera.

The patent focal-plane shutter employed and the mirror are practically part and parcel of one system, for the movement that releases the mirror releases the shutter at the same time, virtual instantaneity and simul-

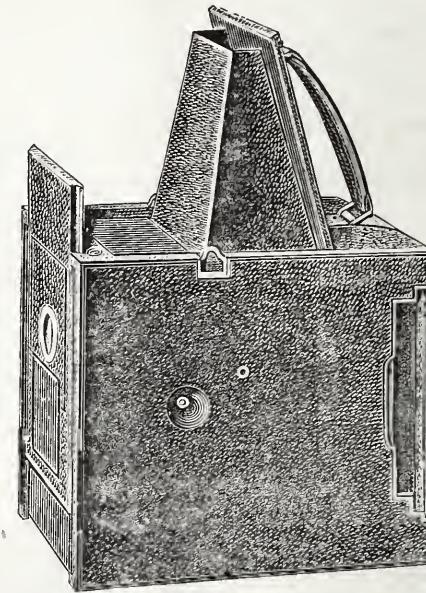
taneity being assured, and smoothness and noiselessness characterising the double motion. The method of controlling the shutter is exceedingly ingenious. The driving spring is always wound to its full tension, and the different speeds are obtained by varying the slit, command over which is obtained by means of a knob outside the camera. These speeds are marked on the “blind,” and are visible from the outside of the camera; they range from one-thousandth to one-tenth of a second, and time exposures are also available.

Double dark slides are used in the camera, space in the bottom of which is provided for carrying two not placed *in situ*, but a focussing



screen is also fitted for stand work. The rising front, which is available for either horizontal or vertical pictures, moves to the very great extent of one and a half inches, a long rise on a 5×4 plate.

In the foregoing brief description we have only outlined the main features of the Reflex hand camera, which, we need hardly say, has all the old familiar Adams excellence of construction and exquisite finish, but of the instrument as a whole it is right to say that it embodies the reflector principle to perfection. The serious worker will assuredly



appreciate the Adams Reflex, at once a high-grade and a high-speed machine. In all its parts and movements it bears skilled analysis and scrutiny. You see your finder image perfectly and to the full size, and the control of your lens aperture and your shutter speed are obtainable with the least expenditure of power. The remaining details of the camera have been carefully thought out, and we have no hesitation in recommending the Adams Reflex to the class of photographers for whom it has been designed.

CATALOGUES RECEIVED.

Rae Brothers, Glasgow, Paisley, and Perth.

THIS is a well-printed and illustrated catalogue of about 160 pages, giving detailed particulars of an immense variety of photographic apparatus and material. Both amateurs and professionals will find it of use for consultation, for it makes reference to the requirements of both classes of photographers. Moreover, it has the added advantage of being well up to date as regards its contents.

The Columbia Optical and Camera Company, 42, Goswell-road, E.C.

In this catalogue we have particulars and prices of a large collection of American-made photographic apparatus, amongst which are Bausch & Lomb's Unicum shutters, Gundlach's shutters, the Turner-Reich convertible anastigmat lenses, the Recto, Monroe, Kozy, Korona, and other cameras, and a variety of other photographic apparatus.

Thomas Illingworth & Co., Willesden Junction, N.W.

THIS catalogue appeals both to professional photographers and the trade, for it gives prices and particulars of Messrs. Illingworth's specialities in backgrounds, bromide enlargements and printing, canvas enlargements (bromide), carbon enlargements and printing, circle frames, collotype printing, copying or making negatives, developing, finishing enlargements, framing, gelatino-chloride printing, carbons on ivory, Kodak developing and printing, lantern slides, enlarged negatives, painting enlargements, oil paintings, orthochromatic photography, process blocks, platinotype enlargements and printing, retouching, silver printing, toned bromide enlargements, toning and fixing, Vigo enlargements.

SPECIMENS OF FRAMES FOR PHOTOGRAPHS.

Manufactured by Rogers & Webster, 161, High Holborn, W.C.

THE samples of frames for photographs which Messrs. Rogers & Webster have submitted to us, appeal to the most refined taste. We should like to see a more general employment of such aids, to showing off photographs to the best advantage, so that in time the common and gaudy gilt frames which are so prevalent nowadays, would no longer offend the eye, and disfigure our walls. Messrs. Rogers & Webster's specialities comprise walnut ovals and circles, with gold lines and square outside frames, and the surfaces are of a rich warm brown colour, a tint well suited to the majority of photographs irrespective of tone. The frames have keyed corners thus preventing shrinking, and the workmanship is English and excellent. Panels with relief designs are others of Messrs. Rogers and Webster's specialities, which we have pleasure in bringing to the notice of our readers, who wish to be in touch with the latest ideas in photograph framing. Many of the most prominent London professional photographers are adopting these coloured hard wood frames, which deserve very high praise.

Studio Gossip.

MR. WALTER MACFARLANE has purchased the portrait business of Greenway, Brothers, of 339A, High-street, Cheltenham, and is conducting it under his own name.

ACCORDING to the *Daily Mail*, Mrs. Smith, of Blackpool, a medium who takes part in the séances of the new spiritualist church at Wolverhampton, told those assembled there recently that, on the previous day, after all arrangements had been made in the hall for the opening service on Sunday, she and one or two other friends sat quietly in the place for about an hour, indulging in spirit thought. The spirit forms of Dr. Berry, Ward-Beecher, and John Ruskin entered the hall. She saw and recognised each very plainly. This was corroborated by Mr. Aldridge, of Wolverhampton, who for some years has been connected with Spiritualism. An admirer of Dr. Berry in the audience asked whether it would be possible to photograph the "spirit" of the doctor, so as to convince the sceptical. It was explained, in answer, that spirit photographs were not unknown, but that certain conditions were essential.

"B.-P.'s" PHOTOGRAPHIC STAMPS.—We read that a prominent postage-stamp dealer was interviewed about "B.-P.'s" new stamps at Mafeking. Undoubtedly the stamps on photographic paper, reported to have been issued by Colonel Baden-Powell, will be accepted as genuine if they were issued of necessity. What the reported "surcharged" stamps are, however, is a mystery. Supposing the ordinary town postage at Mafeking to be a penny, the Colonel has no right, from a stamp-collector's point of view, to surcharge penny stamps a shilling on account of the extra risk in delivering letters under fire. The laws of philately may seem absurd, but they are immutable. If the postmaster at Mafeking ran out of 2½d. stamps, and surcharged other stamps, these would have a high value. Colonel Baden-Powell may increase postmen's wages, but any surcharged for this cause will not obtain acceptance among philatelists.

SHYNESS IN OUTDOOR PHOTOGRAPHY.—Writing in the *English Mechanic* on outdoor photography, a correspondent of that journal says: "I believe that shyness is one of the chief causes of failure. An operator must not fear being conspicuous, and he will often have to encounter some harmless public ridicule if he means to be successful. We will take street processions as an example. Frequently (due to the large number of sightseers) it is impossible to get a desirable position on the road or footpath. As to chamber windows, they are too high. My own method is to mount a pair of steps, or to stand on something else I provide which places me above the heads of the spectators, and usually I am fairly satisfied with the results. I get a friend or two to stand near my platform, to guard against accidental overthrow. There may be a slight measure of risk, but encounter of that is usually to be on the right side of the line between success and failure. Crafty, stealthy movements are, of course, sometimes desirable, in order to secure some subjects (so that the

subject is unaware of being shot at, and so driven to seek cover), but I am convinced that a too retiring disposition on the part of the amateur photographer accounts for very much commonplace, unsatisfactory work."

AMUSING THE BABY.—"When a baby doesn't want to have its photograph taken," writes an American journalist of a humorist turn, "it is a pretty difficult feat to persuade it to the contrary or to fool it. A baby knows when it doesn't want to be photographed, and it resents all efforts to the contrary on the part of its mother, father, grandmother, and aunt, who have come along to assist in the ceremony. Every one joins in the effort to persuade the baby to be good and be photographed, until it is tired out with the noise and the attention, and its little whimpering cry, with the wrinkled nose and distended cheeks and crossed eyes, gives way to a lusty bawl. At this the efforts of the baby's friends and the photographer are redoubled. The baby bawls the louder. The photographer blows whistles, beats a tambourine, stands on his head, and kicks his legs and shakes a rattle until his arm is tired. Occasionally the baby gets slightly interested and stops crying for a moment; but, as soon as the photographer sets to work to make the photograph, it begins to cry again. At this the photographer gives up, and is driven to his last resort to keep the baby quiet for a few minutes. He burns paper! No one knows why a baby will stop crying long enough to be photographed when it sees paper burning, but it does. When the baby grows up, he will stand and watch with some degree of enjoyment a building burning down—a sort of savage instinct, probably. However that may be, a lighted newspaper on the floor will cause a crying baby instantly to desist. His eyes will assume a beautiful baby stare, his baby lips will part in pleased wonderment, and, before the paper burns up or the gallery burns down, the photographer has made the picture."

News and Notes.

THE Richmond Camera Club held a *Conversazione* in the Prince's Hall at the Star and Garter Hotel, Richmond, on Thursday evening, April 26.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The dates fixed for the Hackney Photographic Society's Annual Exhibition are November 21-23.

THE Annual Dinner of the Camera Club will be held in the Club large-room on Thursday, May 10, 1900, at 7.30 p.m., Sir William de W. Abney, K.C.B., F.R.S., &c., in the chair.

ROYAL PHOTOGRAPHIC SOCIETY.—May 8, Ordinary Meeting, at 66, Russell-square, at eight p.m. Mr. Chapman Jones, F.I.C., F.C.S., will read a paper on "The Effects of Colour on Gradation." The exhibition of photographs (mainly architectural) by Mr. F. H. Evans, now on view, can be viewed on presentation of visiting card.

MR. WALTER D. WELFORD writes: "A very little error in your paragraph last week as to my demonstrating the Thornton film, viz., the number of the road being printed as 168 instead of 166, has led to some inconvenience. If 'Warwick Lodge' is on the envelope, it is all right, but 166 is in the Stratford delivery, whilst 168 is in Forest Gate. Moreover, the occupier of 168 has expressed annoyance at the letters being delivered there. Will your readers kindly note that the number is 166, Romford-road, E. By the bye, I might mention that the film in future will be known as the Thornton film."

THE Ninth Annual Exhibition of the Brixton and Clapham Camera Club was held last week. For the best individual collection, the silver-gilt medal was awarded to Mr. Tryhorn for a series of remarkably fine architectural studies, the silver medal going to Mr. W. E. Dunmore for a set which included what, in the opinion of the Judges, was the best photograph in the room, a winter study in a London-street, an exquisite example of this class of work. Bronze medals were also awarded to Mr. F. W. Levett and Mr. R. Fisher. There was a loan collection, which included work by Messrs. Harold Baker, W. Thomas, W. T. Greatbach, and others, and, if not so large as some of its predecessors, the Exhibition contained some high-class work and very little indifferent photography.

THE COMMERCIAL SEPARATION OF PLATINUM FROM GOLD.—Scraps, filings, &c., of gold containing platinum are put on one side in minting operations, as the ordinary methods of gold refining cannot be applied to them with success. The following method has been successfully used by the author when dealing with large quantities of such scrap. The sifted filings are digested with nitric acid of 1:199 density, until no more silver is dissolved. During this operation a small quantity of platinum also goes into solution in the form of platinonitrite of silver. The metallic residue is washed and exhausted with aqua regia of the following composition:—Concentrated hydrochloric acid, 100 volumes; concentrated nitric acid, 43 volumes; water, 143 volumes. When the chloride of silver which deposits on the surface of the metal stops all further action, the solution of chloride of gold is decanted, and the chloride of silver removed by washing the metal with a little ammonia. The metal may then be treated a second time with aqua regia. After six successive treatments with aqua regia and ammonia, the metallic residue consists of pure platinum. The acid solution which contains the gold is evaporated down with an excess of hydrochloric acid, to drive off the nitric acid, until the chloride of gold crystallises. The chloride of gold is redissolved, and the small quantity of platinum present is precipitated by means of chloride of ammonium. Finally, the gold is precipitated by ferrous sulphate. The filings treated by the author contained:—Gold, 28·05 per cent.; silver, 10·56 per cent.; platinum, 45·46 per cent.; copper, 15·93 per cent. If the metals form a true alloy, it is preferable to previously melt this alloy with 3 parts of lead, or, what is even better, 3 parts of zinc. The metal is then granulated and treated with sulphuric acid, which dissolves the zinc, and the spongy residue is treated in the manner above described.—E. PRIWZNIK in *Österr. Zeits. f. Berg. u. Hüttenwesen*, 1899, p. 356.

Commercial Intelligence.

THE Thornton Film Company, of Altringham, Cheshire, announce that they have in preparation, and will shortly issue, a new film, which will be supplied on daylight loading spools, and known by the trade name of "Dayroll," and will be supplied in flat cut pieces for all descriptions of cameras.

MR. W. O. STANLEY, having resigned his appointment as manager for Messrs. Stanley & Co., of 1, Clare-street, Dublin, begs to notify that he intends resuming business on his own account as photographic camera and scientific instrument maker, at 31, Lincoln-place, Dublin, on and after May 1, 1900, trading as William Stanley.

MESSRS. WERTHEIMER, LEA, & CO., inform us that, owing to the termination of their leases at London Wall, and the decision of the Corporation to widen that thoroughfare, they have been compelled to obtain new premises for their works, and to transfer their offices to 46 and 47, London-wall, first floor (six doors from Moorgate-street).

MR. ARTHUR RAYMENT, late of the well-known house of Perkin, Son, & Rayment, Hatton-garden, E.C., informs us that he has taken up the wholesale agency for the United Kingdom of the celebrated firm of Steinheil & Sons, of Paris and Munich. All the optical and other productions of Messrs. Steinheil will be included in Mr. Rayment's agency, the new orthostigmats, the antiplanats, tele-objectives, shutters, &c., being listed in his catalogue. Messrs. Steinheil fit Kodak and other cameras with their lenses and shutters, a branch of the business to which Mr. Rayment intends devoting attention. Mr. Rayment has had over thirty years' experience in the photographic trade, and is well known and esteemed all over the country.

SPECIAL SERIES OF WAR PICTURES.—By special arrangement with the proprietors of the *Sphere*, Messrs. Eyre & Spottiswoode are publishing a series of photographic reproductions of "Scenes at the Front," from sketches made on the spot for the *Sphere* by special artists. This series comprises the following subjects, as opalines, size 8 x 6 inches, on plush or khaki:—1. The Fight for Spion Kop; 2. How Lord Roberts's son won the V.C. at Colenso; 3. The Brave Piper at Magersfontein; 4. The Dublin Fusiliers Crossing the Tugela; 5. The Attack on Spion Kop by the Lancashire Fusiliers; 6. The Queen's (Royal West Surrey) Regiment advancing at Colenso; 7. Sailors at the Front. Messrs. Eyre & Spottiswoode also announce that they have made arrangements to publish, in cabinet size, printed in first-class style by the Woodburytype process, a series of portraits of the Generals at the Front. The first set will comprise the following:—Field-Marshal Lord Roberts, V.C.; General Sir Redvers Buller, V.C.; Lieut.-General Sir George White, V.C.; Lieut.-General Lord Methuen; Major-General Hector Macdonald; Major-General Sir W. F. Gatacre; Major-General Hon. N. Lyttleton. The photographs will be suitably mounted upon titled mounts.

THE PATENT LAWS AND FOREIGN COMPETITION.—It is pointed out, in the current issue of *Feilden's Magazine*, that most of the injury done to British taxpayers by our patent system is the result of the disconformity existing between our patent laws and those of foreign nations. Thus, for instance, in Germany, France, or Austria, the patentee, during the lifetime of his patent, may take out supplementary patents relating to improvements. These additional patents, however, expire simultaneously with the main patent. In England such additions are not provided for. The foreign inventor consequently takes out ordinary patents for them, and the result is that his invention continues often to have a monopoly for many years yet after it has expired in his own country. The most unfair point, however, insisted upon by *Feilden's Magazine* consists in the injury done to the British taxpayer, arising from the fact that we grant annually about nine thousand monopolies in excess of those granted by Germany, which means that there are thousands of articles protected in Great Britain for which the Government of our commercial rivals refuse patents. The articles so protected are manufactured in Germany, without any restriction or royalty, at a cost considerably lower than they could be manufactured here. The German manufacturers, therefore, supply the British demand at their own prices without adding a penny to the imperial or local taxation.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
7.....	Bradford Photo. Society	Platinotype. Rev. J. Beanland, M.A.
8.....	Hackney	Demonstration: Secco Films. E. Binns.
8.....	Isle of Thanet	{ Further Wanderings with the Camera. P. Solly.—Odds and Ends. Mr. Blower.
8.....	Leeds Photo. Society	{ Composition and Tone Values. W. E. Tindall, R.B.A.
8.....	Royal Photographic Society ...	{ The Effects of Colour on Gradation. Chapman Jones, F.I.C., F.C.S.
9.....	Croydon Camera Club	Hand Cameras of 1900.
10.....	South Norwood	How a Lens is Made. O. P. Goerz.
11.....	Croydon Microscopical	Prize Slides.
12.....	Borough Polytechnic	{ Excursion: Epping Forest. Leader, H. T. Malby, F.R.P.S.
12.....	Liverpool Amateur	{ Excursion: Llangollen. Leader, T. E. Corney Wilson.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 25.—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

"ONE-MAN" EXHIBITION BY MR. F. H. EVANS.

MR. F. H. EVANS formally opened an exhibition of his architectural and other work, constituting the third of the Society's series of House Exhibitions. The collection comprises views of Kelmscott Manor (once the home of the late William Morris), the cathedrals of Lincoln, Canterbury, St. David's, Gloucester, Ely, Wells, and Bourges; Beverley Minster, the New Forest, Epping Forest, and Redlands Woods, Lakeland, some fine studies of sea and sky, and some very striking portraits, including two of the late Aubrey Beardsley. In the course of his introductory address, Mr. Evans said that in his architectural work he was attracted by the beautiful and artistic aspects of the subjects rather than influenced by their architectural or antiquarian value. Architecture lent itself most readily to photographic reproduction, and the so-called mechanical exactitude of the camera was an element of importance in the rendering of far finer and more abundant detail than was possible to the painter or draughtsman. In the hands of an artist photography was capable of yielding true effects of light and shade, accurate drawing, good composition, and all the elements that architecture demanded, and it was certainly not a mechanical method. His chief aim had been to produce such effects of light and shade as would give an irresistible quality that one was in an interior, with solidity and perfection of perspective, and atmosphere and massiveness of outline. All the prints were in platinotype, the variations of colour being due to the character of the negatives, and in some cases to the condition of the paper, the differences in the negatives arising from the nature of the subject and not from the method of development. They were all from untouched negatives, except that a little ordinary spotting had sometimes been necessary. When working on the back of a negative, he found it all but impossible to avoid upsetting the natural gradations of the subject and introducing false lighting, and it was useless to spend time in trying to make bad negatives yield good prints. Plain prints from plain negatives was, he thought, pure photography; he was content with pure photography, and it was not such a bad road to travel by towards the goal of art. Whatever printing process was adopted, success was dependent upon the quality of the negative and the conditions under which the photograph was taken; if these were correct, and exposure adequate, a platinotype or carbon or gum-bichromate print would be equally good. He urged photographers to be content with pure photography, and in architectural work especially deprecated dodging and altering the negative or the print; photographs that seemed to have been taken by a light that never was by land or sea, had no interest for him. The study of black and white would be found to greatly assist young photographers, and to help them to analyse a subject, and to see when it was best capable of adequate translation into monochrome. Referring to his landscapes, Mr. Evans said that most of them were taken with a Burchett colour screen, and the clouds were on the same plates. He could not bring himself to believe in the possible success or legitimacy of using cloud forms not taken at the same time and place as the landscape, and the method of printing in clouds could only be satisfactory by the luckiest of chances. If the clouds were in the negative, they induced the feeling that they were an integral part of the picture; but alien cloud forms, and working on the back of the negative, made a photograph incoherent, puzzling, and wearisome. The question whether photography was art had been much discussed, and was generally limited to intelligent assertion on the one side and ignorant assertion on the other; but might not photography, at any rate, be considered worthy of a place amongst the crafts? He had often tried to repeat some of his negatives, but invariably failed, and he challenged any one to go to any of the places depicted in the Exhibition and bring back the same thing with mechanical accuracy. If this did not mean individuality, it meant nothing, and individuality was the basis of all art. Nearly all his portraits were taken with a Dallmeyer-Bergheim lens, in a studio formed by knocking two attics into one and adding a side light. The Spring Exhibition at Burlington House could show quite as many dreadful things as the Autumn Exhibition at Pall Mall, and he hoped he would never have to say, "I cannot draw, I cannot paint, and to photograph I am ashamed."

The CHAIRMAN was very pleased to hear Mr. Evans say that his pictures were pure photography, and not mixtures of photography and something else which no one could define, and for which mixture no one had been able to find a name.

Mr. J. C. S. MUMMERY was glad that Mr. Evans had spoken so strongly and so tritely about double printing and alien clouds, a subject which he had done well in bringing so prominently forward.

Mr. W. THOMAS entirely dissented from the assumption that the best and most truthful atmospheric qualities were always to be obtained by the use of only one negative; if falsities were introduced, they did not arise from the method of using two negatives, but from the ignorance of the person who introduced them. Every practical photographer knew that one negative could be made to render, and to render successfully, some phases of atmospheric conditions; but his opinion, based upon some little experience, was that improvements could be made, and more truthful reproductions sometimes obtained, by the employment of a separate cloud negative. This, however, must be done with skill and knowledge, and if one had not these one had better not try double printing.

The Exhibition will remain open daily during the present month, and tickets of admission may be obtained on application to the Assistant Secretary at the Society's rooms, 66, Russell-square, W.C.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 26.—M. S. Herbert Fry in the chair.

Mr. WALTER D. WELFORD, alluding to the fact that a statement of his some time ago, that he could develop a negative to full capacity in sixty seconds, was received with incredulity by one or two, said that he was now prepared to guaran-

tee to do the same in twenty seconds repeatedly. He was quite in agreement with a remark that it was a course not to be recommended in certain particular cases, but, in dealing with quantities of work which was just as well done one way as the other, the saving of time was enormous. The developer was a combination developer, and he proposed at an early date to give a demonstration of its rapid action, and also of the continuing action of the ortol developer, by means of which it was possible to finish the development of a plate removed from the solution just after the appearance of the image by holding it under running water.

Mr. H. C. RAPSON complained that ortol had a strong staining action upon his fingers, which were of a marked pink colour after a few hours' use of this developer at the weak strength of the normal solution.

Mr. WELFORD remarked that it was entirely without effect on himself, even after fifteen hours' continual use, and that therefore, as with other developers, it must be a personal question—some it stained and others not.

Then followed a long discussion of a conversational nature upon the characteristics and qualities of the various films which are now upon the market.

A great deal of the uncertainty and want of reliability in celluloid films was attributed by Mr. HADDON, in the first place, to imperfect washing of the pyroxylene used in the preparation of the celluloid, apart from defects of the emulsion itself.

The question of grain in negatives upon films having originally a paper support was alluded to, as well as that of the avoidance of cockled results after stripping, opinions for and against such films being freely expressed.

PHOTOGRAPHIC CLUB.

APRIL 25.—Mr. Charles Wallis in the chair.

Mr. E. A. NEWELL gave an exhibition of lantern slides, part of a series illustrating London, upon which he was engaged. Starting from the west and proceeding eastwards, he showed successively views of the statuary and other details of the Albert Memorial, Lambeth Palace and Bridge, the Houses of Parliament, Westminster Abbey, the Clock Tower, the lions in Trafalgar Square, Somerset House and the Embankment, Goldsmith's Tomb, Tower Bridge, and some pretty little bits on the river down to Rotherhithe. Other miscellaneous views were of Midhurst Castle, Canterbury, the country round Llanberis; Surrey; and, in Belgium, Dinant, Antwerp, &c., including a view of the old Steen Castle before restoration. The London views were all hand-camera work, bright, and picturesque, and reminding one that there is an endless store of subjects for the camera at hand, well worthy of attention, without the necessity to go far afield, as is so often imagined. The warm colour of the slides, produced by pyro-ammonia development, was very pleasing and suitable.

The SECRETARY read a communication from the Paris Exhibition authorities, stating that the use of hand cameras was allowed without payment, the charge for stand cameras, until, one o'clock p.m. being 25 francs per day, or 1000 francs for the season.

Richmond Camera Club.—At the meeting on the 23rd ult. Mr. W. E. Dunmore, of the Tella Camera Company, gave a demonstration of the various unique points of this most ingenious hand camera. By means of a model with glass sides the working of the changing mechanism was very clearly shown, and the manner in which the exposed film was transferred to one chamber while the celluloid separator took its way to another was studied with much interest. Mr. Dunmore showed some slides which well supported the claim of the Tella to be capable of turning out good work. Incidentally they also spoke well for the quality of the films used, viz., those supplied by the Tella Company, and of the Cooke lens fitted to the camera. A cordial vote of thanks to Mr. Dunmore and the Tella Company concluded the meeting.

Aintree Photographic Society.—At last week's meeting a large gathering met to take part in a descriptive tour through the "Lowlands of Scotland," by Mr. Daniel J. Niell, who proved to those present, by exhibiting some seventy lantern slides of places of interest closely associated with Sir Walter Scott and the "peasant" poet, "Bobbie" Burns, that there is ample material in this part of "bonnie" Scotland to satisfy the most fastidious "globe-trotter" photographer, and who might from his negatives make up a most interesting lecture, or even a series of lectures, not only of landscape, but many interesting architectural subjects, especially if he is lucky enough to secure a number of views of the elaborately beautiful Melrose Abbey.

FORTHCOMING EXHIBITIONS.

1900.

May 23-25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.

July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between April 17 and April 21, 1900:—

BACKGROUND.—No. 7042. "Improved Background or Screens for Photographic or other purposes." W. BROOKES.

NEGATIVE DRYER.—No. 7065. "Improved Means of Drying Photographic Plates or the like." W. BROOKES.

"PRODUCING PICTURES."—No. 7381. "Improvements in the Method of and Means for Producing Photographic Pictures." C. A. BURGHARDT.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE KEEPING QUALITIES OF PLATES.

To the Editors.

GENTLEMEN,—A letter received this morning seems to confirm the correspondence to you on the 18th inst. with reference to the keeping qualities of our plates. Please see from enclosed what MESSRS. Lavis, of Eastbourne, say.—We are, yours, &c., MARION & Co.

22 and 23 Soho-square, London, W.C., April 28, 1900.

[The letter to which Messrs. Marion refer is from the well-known photographers, Messrs. G. & R. Lavis, of Eastbourne, who write that some time ago they developed a 12×10 Marion plate nine years after exposure and found it all right.—EDS.]

RENOVATING BLINDS.

To the Editors.

GENTLEMEN,—Like your correspondent, D. McFarlane, I have been troubled in the same manner. It is a difficult operation, and requires both skill and experience to do them well; here is the *modus operandi* as practised upon mine, they roll up flat and even.

After being washed and well rinsed, whilst wet, starch them, hang them out smoothly on a line to dry—not on a windy day; when nearly dry, place them evenly on a smooth ironing board, covered with a blanket; let them be ironed with a hot iron, they will then lie flat and even—patience and care will overcome all the bagginess.—I am, yours, &c., W. GIRLING.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to MESSRS. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

- A. Mallett, High-street, Christchurch, Hants.—Photograph of Lieutenant G. R. Stephens.
- A. B. Gardiner, 14, Grey-street, Newcastle.—Photograph of group of Boys' Brigade of St. Mary's, Newcastle.
- Rev. W. C. Johnson, Yaxham Rectory, East Dereham, Norfolk, and R. W. Howes, East Dereham, Norfolk.—Photograph of miniature of the poet Cowper.
- A. J. Webber, 41, Darlington-street, Wolverhampton.—Photograph of New Cross House, New Cross, near Wolverhampton. Photograph of the foundation-stone of the new Workhouse at New Cross for Wolverhampton.

VIEWS.—The articles you mention may be obtained of such houses as MESSRS. Marion, Soho-square, G. Houghton & Sons, High Holborn, W.C., and others, whose addresses you will find in our ALMANAC for 1900.

REFLEX.—The first-named camera is fully reviewed on another page; the other instrument was noticed in the JOURNAL for March 23 and 30. It is strictly against our rule to make recommendations of the nature asked for.

BROMIDE.—1. Messrs. Morgan & Kidd, Richmond, the London Stereoscopic Company, 54, Cheapside, and other firms whose addresses will be found in our ALMANAC, undertake such work. 2. Messrs. Sharp & Hitchmough, Dale-street, Liverpool, might be able to supply you. 3. For portrait work, pure and simple, we should advise a portrait lens.

STUDIO-BUILDING.—T. BETTS. A studio but twenty feet long is very inconvenient for general professional work. As you can get any length, we should advise you to have it from five to ten feet longer. Your suggestion to have five feet at either end as merely a small tunnel in which the camera can be run, as occasion requires, is excellent, and will answer every purpose.

F. A.—We have had no personal experience of the process, but theoretically either strength should answer, provided that your image has been thoroughly fixed and cleared. From the description of your trouble, we imagine you have failed in one of these respects. With a pure deposit of silver you should get the tone mentioned. A short washing after toning is all that is required.

USE OF THE RULED SCREEN.—AJAX writes: "I am asked to take a photograph of a silver-print photograph. A print from my negative will be used for making a half-tone block from, as a book illustration. Shall I get a better result if I use a ruled screen when making my negative?" —Better send the original print to the block-maker; or, if you copy it, send your copy. The block-maker will then copy it with the screen that suits his purpose best.

POUNCY'S OIL-COLOUR PROCESS.—ARTIST writes: "Could you kindly inform me by what process Mr. Pouncy produced oil paintings direct on canvas without a photographic base? Is the process a patent, or have the rights expired?" —Pouncy's process was on a photographic base by the bitumen process. There were two patents, both of which have expired. They were numbered 267, 1863, and 3849, 1868. You can obtain the complete specification at the Patent Office for 8d. each.

BLINDS FOR STUDIO.—J. H. W. says: "My studio has a south-west light, and the sun, at times, gives trouble. The top blinds at present are white, and, when the direct sun is on the studio, there is a great glare in it. Would any other colour be better than white, as I must put up new blinds of some sort shortly?" —With a studio with such an aspect we should have a tolerably dark green for the blinds and curtains. These would avoid the glare complained of, and be a pleasant light for the sitters.

PROCESS WORK.—S. S. G. writes: "A local paper wants to reproduce four of my photographs. Will you please tell me how to make the blocks? also, whether one of the costly ruled screens is an absolute necessity for the work?" —Yes, and a properly arranged camera to take it. Our correspondent had better send his photographs to a process block-maker to do the work for him, as it would not pay him to purchase the necessary screen, and then learn how to use it, merely to produce four blocks.

PROMISSORY NOTE.—SWINDLE. If you gave a promissory note for the apparatus, we expect you will have to meet it when it becomes due. It will be no defence to an action upon it that you now find that the things are not of the value you were led to believe. You saw them beforehand, and had the opportunity of judging their value. Old and obsolete photographic apparatus should, of course, not be assessed at its original catalogue price; that you should have been aware of when you made the purchase.

IMPROVED LIGHT.—SNAP-SHOT says: "Kindly tell me what is the matter with the two negatives sent herewith, which I hope you will receive without breakage? All the negatives I have developed lately have turned out like these." —The only thing the matter with the negatives is that they are much over-exposed. The light during the last few weeks has much improved, and also become more actinic, and this has not been sufficiently allowed for in the exposures. Bear in mind that just now the actinism is about reaching its zenith.

THE CHROMATYPE PROCESS.—A. BIGNOLD asks what was the chromatype process and how was it worked? —A chromatype is a highly glazed carbon print produced in this way: The print is developed on a collodionised plate that has been previously waxed to facilitate its being stripped from the plate when finished. When the print is developed and dried, one or more thicknesses of softened double transfer paper are squeegeed upon it and allowed to dry, and the whole stripped off. Usually the name and address of the photographer was produced at the bottom of the picture by double printing.

LENS FOR STUDIO WORK.—W. W. J. asks: "Is there any great disadvantage in using a long-focus lens for portraits? My case is this: I have taken premises with a studio about thirty-five feet long, and the only lens I have at present is a '3A' portrait, but this requires about twenty-five feet between sitter and camera for a full-length cabinet portrait. Will that be a disadvantage?" —No; on the contrary, it will be a great advantage, as the pictures will be in better perspective and more pleasing than if a shorter-focus lens were used. The fault in so many portraits is that they are taken too near the sitter.

COLLOTYPE PRINTING.—COLLOTYPE writes: "Why cannot the necessary appliances for working collotype be obtained here, for I am told they can only be obtained from Germany? Is there no house here enterprising enough to supply it, and why? Can you give me the address of any house in Germany from whom I could get a small outfit, and the probable price?" —Messrs. Penrose & Co., Baker-street, Lloyd-square, W.C., supply all the appliance for the collotype process, and have done so for some years past. Better apply to them for a price-list. You see your strictures on lack of British enterprise are not warranted by facts.

PHOTO-SCULPTURE.—R. PARKER. So far as we are aware, there is no one in this country who is producing plaster busts by photo-sculpture commercially. Both the patented processes mentioned you are free to work, as the patents expired many years ago. We can offer no opinion as to whether you would find photo-sculpture take with the public at the present time, even if the prices charged were moderate. We should, however, be rather inclined to doubt it.

THE COLLODION PROCESS.—T. T. says: "I am an operator out of employment, and, like many others, find a difficulty in getting a job. Is the wet-collodion process difficult to learn, as I might, if I could work it, perhaps, get employment with some of the process workers?" —The wet-collodion process is not difficult to work to those who understand it; but it requires to be learnt, and it is very different from the gelatine process with the plates bought ready for exposure. All the old manuals give full working details of the wet-collodion process.

RECOVERING GOLD FROM TONING SOLUTIONS.—GOLD says: "After using sulphocyanide toning bath, I throw it away, and I am certain there is some of the gold in it, as I don't stint the gold when making up. Can you inform me how to reduce it? In the fifties, with albumenised paper, I used to reduce it with iron, but I suppose that will not act with the sulphocyanide." —The gold may be precipitated with the sulphate of iron as in the method you used to employ. It will be well to acidify the iron solution before adding it.

LECTURES ON PHOTOGRAPHY AND THE SPECTROSCOPE.—H. E. S. writes: "I read about two months ago that a course of lectures would be given at, I think, University College on photography and the spectroscope. I think the paragraph was in your paper, but cannot find it again. What I want to know is, Are the lectures published; and, if so, could I obtain a copy? If you could help me in this matter at all, I should be much obliged, as I have looked in vain in most of the photographic papers for a reference to the subject again. I venture to trouble you, as your paper always seems to me to deal with the scientific side of photography to a greater extent than any of the others." —In reply: We have not seen mention of the publication of the lectures in question, but perhaps this insertion of our correspondent's question may elicit definite information on the point.

STUDIO-BUILDING.—W. W. SMITH writes: "As I am troubled very much in getting my sitters dark in the hair, and also people with light blue eyes and sometimes brown eyes, I get very strong catch lights in their eyes, and they are always finding fault with same. Could you inform me, through your valuable JOURNAL, which way I could remedy these defects? Enclosed you will find photographs. I think the negatives are fully exposed; also I have drawn a plan of studio. Studio painted orange green, but I am thinking of painting same light gray. N.N.E. light. Blinds, white cotton. You see, between my side light there runs a dark wall, but between side light and dark wall, there will be about three feet space to let the light (side light) travel up. Top light open. Do you think whitewashing dark wall would be of any service? Length of studio, thirty feet. I have twenty feet of running glass top and side, and I use Imperial Sovereign plates; also their standard developer." —The fault in the portraits is that they are badly lighted. Too much direct front light has been employed, and the negatives are also under-exposed. The sketch shows that the studio is all that can be desired if rightly used. It might be a slight advantage to have the wall whitewashed.

TONING, MOUNTING, &c.—S. G. ELLIOTT writes: "1. The toning bath made up as follows: water, 20 ounces; sulphocyanide of pot., 20 grains; gold chloride, 2 grains, which, according to a leaflet I have, should tone twenty-four half-plate prints a purple black, only tones three or four half-plate prints when placed one at a time in a half-plate developing dish with a portion of the toning solution. The leaflet above mentioned says that several should be toned together, but this would appear to necessitate a very large dish, which is not altogether in keeping with an amateur's requirements. I purchased a combined bath (pint) some time back from a local chemist; this toned about thirty-six half-plate photographs a very dark colour, and kept well. Could you, please, quote a formula, either separate or combined, that would keep and meet the above requirements, or suggest a satisfactory method of carrying out above? 2. I have some difficulty in mounting P.O.P. photographs which have been polished on a ferrotypic plate; they lose some of the gloss, and do not go down quite firm on the mount, but are somewhat blotchy and irregular. I have no difficulty in mounting photographs, when wet, with the aid of a roller and linen as advised; but, when mounting dry, the result does not at all please me. The mountant used is Higgen's; this I brush all over the back of P.O.P., which I then place on mounts and roll. Could you suggest a remedy, please, as I much prefer the polished surface, and am anxious to improve the mounting? 3. Can dry plates be made into positives? if so, how? 4. What formula is used for positive dry plates, and where are they obtainable?" —1. The bath should, if the chloride of gold was good, tone the number of prints mentioned, or, a proportionate quantity, a proportionate number. It is better to keep the gold and sulphocyanide in separate solutions, and mix when required for use. A formula for a combined toning and fixing bath is given on p. 1075 of the ALMANAC. 2. If you desire to retain the full gloss, you had better use the backing paper supplied, specially for the work, by all the dealers. 3. Ordinary gelatine plates are not suitable for positives. 4. Dry plates for positives are supplied by Fallowfield & Co. We do not know by what formula they are prepared.

* * * Owing to exceptional pressure on our space this week, we are compelled to hold over many answers to correspondents, reviews, and other matter.

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EX CATHEDRÀ.

HE *Handbook* of Imperial plates and papers issued by the Imperial Dry Plate Company, of Cricklewood, London, N.W., is a decidedly instructive and useful publication which we can recommend to the studious attention of all photographers, be they "Imperialists" or not. The formulae are expressed in both the English and metric systems, and there is added, for the first time, a developing table giving the time of appearance of image and the total time of development for the Company's plates and papers. In the section of the book devoted to exposure notes there are half-tone reproductions from photographs illustrating the subjects given in the exposure table: sky and sea, a light interior, a panorama, a dark interior, river scenery, and a glade under trees. Other articles in the book deal clearly and tersely with the after-treatment of faulty negatives, stops, home portraiture, &c., and, by way of supplement, there is given a series of half-tone reproductions of negatives illustrating the article first named. These illustrations show on transparent paper negatives before and after

intensification, and before and after reduction, while the positive results are printed on ordinary opaque paper. The *Imperial Handbook* is obtainable gratis of dealers and the Company, and the useful object-lessons it contains make it well worth having.

* * *

BY the kindness of Mr. C. H. Talbot, of Lacock Abbey, Chippenham, we have received a statement of the present position of the Fox Talbot Memorial Fund. It is the first financial statement yet issued. The proposed memorial takes the form of the restoration of the chancel of Lacock Church, Wilts, and the estimated cost is 1000L. The following is a list of the subscriptions received since January 1, 1900: Mr. R. P. Brereton, 1L. 1s.; Mrs. Hamilton, 2L.; Miss Ellen Spedding, 1L.; Mr. G. P. Fuller, 5L.; Mr. Charles Awdry, 100L.; Mr. W. Steward Bell, 25L. The balance in hand on December 31, 1899, was 80L. 1s. 9d., so that at present the fund amounts to 214L. 2s. 9d. We may again remind our readers that the following comprise the Committee: The Right Rev. the Lord Bishop of Bristol; the Rev. H. W. Armstrong, Lacock Vicarage, Chippenham (Hon. Secretary); Miss Awdry, Notton House, Chippenham; Mr. E. Eyres, Ray Mills, Chippenham; Mr. J. E. Gladstone, Bowden Park, Chippenham; the Rev. W. G. Clark-Maxwell, Clunbury Vicarage, Aston-on-Clun, Salop; Mr. T. Pike, Lacock, Chippenham; Miss Talbot, Lacock Abbey, Chippenham; Mr. C. H. Talbot, Lacock Abbey, Chippenham (Hon. Treasurer); Mr. A. J. Tanner, Lacock, Chippenham. Subscriptions may be paid to the account of the Fox Talbot Memorial Fund, at the Capital and Counties Bank, Chippenham, through any of the metropolitan and country branches of the bank, or they will be received by the Hon. Treasurer, Mr. C. H. Talbot.

* * *

MR. W. G. COLLINGWOOD'S *Life of John Ruskin*, which has just been published by Messrs. Methuen, contains a paragraph relating to a meeting with Longfellow at Verona, which incidentally shows the great art critic to have been even more sympathetically disposed towards photography than is commonly supposed. The paragraph runs: "As I was drawing in the square this morning, in a lovely, quiet,

Italian light, there came up the poet Longfellow, with his little daughter, a girl of twelve or thirteen, with springy-curled flaxen hair—curls, or waves, that wouldn't come out in damp, I mean. They stayed talking beside me some time. I don't think it was a very vain thought that came over me, that if a photograph could have been taken of the beautiful square of Verona, in that soft light, with Longfellow and his daughter talking to me at my work, some people both in England and America would have liked copies of it." It is quite obvious from this that a good many years ago the author of *The Stones of Venice* and *The Seven Lamps of Architecture* had a great appreciation of the possibilities of pictorial photography, otherwise we can hardly imagine him indulging in reflections so eminently favourable towards it. Few modern art critics would care to put on record such an aspiration as the one which we have quoted. The fashion amongst these gentlemen is to decry photography whenever the chance offers.

* * *

MR. W. H. PICKERING, writing in *Popular Astronomy* on the forthcoming eclipse, expresses the opinion—one, we believe, peculiar to himself—that direct photographs of the solar corona have not very much scientific importance. He is inclined to believe that their chief value is an aesthetic one. If well taken, he thinks they form attractive souvenirs of what is undoubtedly one of the grandest celestial phenomena on which the eye of man has ever rested, and it is this aesthetic enjoyment attained, which, it seems to him, will constitute the chief gain of the majority of the expeditions which will view the eclipse. But, if photographs are of little value, drawings are worse than useless, since it is quite impossible during the brief time available during totality to represent, with the least pretensions at accuracy, even a very restricted area of the corona. In Mr. Pickering's opinion the time spent in looking at the paper might much more profitably be expended in watching the eclipse itself, and he recommends those who visit the eclipse region at their own expense to spend but little time in attempts at scientific work. This is a strange and, of course, unconscious comment on the elaborate eclipse preparations by English observers, to which we briefly refer this week on another page. It will probably interest our readers to learn that the special correspondent of THE BRITISH JOURNAL OF PHOTOGRAPHY on this occasion will be Mr. Nevil Maskelyne, who has kindly promised us a series of descriptive articles on the work done by the British Astronomical Association's Expedition.

* * *

MR. W. HOLT, of Fairholme, Manor-road, High Barnet, writes us: "After reading in your valuable paper the articles on 'Vignetted Negatives and Vignetting,' I think it may interest your readers to know that I have lately invented and patented a machine by which vignetted negatives can be obtained direct. Doubtless you will remember publishing a specification of same some few weeks ago, previous to which I wrote you, enclosing some proofs of half-tone results produced by the same machine. (No. of Patent, 5386, 1899.) I beg to enclose a portrait of myself (exposure of which was three seconds) merely as an example of its capabilities, also the negative for your inspection, which kindly return at your convenience." Those of our readers interested in Mr. W. Holt's vignetting machine will find it described at page 171 of the JOURNAL for March 16. We also perceive that it figures in the April number of *Process Work*, issued by Messrs. Penrose & Co., of Upper Baker-street,

E.C., who supply the machine for 16*l.* 16*s.* Judging by the half-tone pictures and the portrait Mr. Holt has been good enough to send us, the machine vignettes admirably. I imagine, however, that its somewhat high price must restrain its use to engraving establishments.

PAPER AND ITS ADAPTABILITY TO PHOTOGRAPH REQUIREMENTS.

THE paper read by Mr. J. Edington Aitken before the Edinburgh Photographic Society, "On Paper-manufacture, with Special Reference to its Photographic Uses," which was published in our last issue, is one of particular interest to photographers. Many of them have but a vague idea of how paper is made, or of what modern papers are composed, and Mr. Aitken has enlightened them considerably on the subject. Paper used to be made exclusively of rags, but now comparatively little rag is used in its manufacture. Other materials, such as the cellulose from esparto grass, wood fibre, straw, &c., are now more generally employed. In his paper the author shows that he is thoroughly au courant with the manufacture of paper, and also with photography, which makes the essay doubly valuable, more especially where he points out the pitfalls that beset the photographer, not only with regard to the paper upon which the picture is printed, but also with respect to the paper in which the emulsioned paper plates may be packed. What is of really still more immediate importance to photographers, as he points out, is the paper employed for the mounts upon which the photographs are to finally rest.

So far as the paper is concerned, such as that used for albumenising, and turned out from the well-known factory in the Rives district, and that by the Steinbach firm in Malmedy, both those papers are probably the purest in the market, as they may be implicitly relied upon for all photographic purposes; but other papers, which are not specially made for photographic work, though often used in silver printing, such as the rough drawing-papers employed by amateurs for "artistic" effects, may give rise to trouble. In these papers there are sometimes chemical impurities that are fatal to photography, though they are excellent in every way for the purposes for which they were specially manufactured.

For the emulsion paper of the P.O.P. type, the photographic paper just referred to is not employed, but a cheaper kind, though much, if not all, of it is made at the same two factories. In the case of the emulsion processes the same purity of paper is not so imperative as in the albumen silver process for the reason that it is usually "surfaced," "baryta-coated" and this coating, to an extent, insulates the emulsion from the paper itself, so that the latter is rendered more or less inert. "Baryta white" (sulphate of baryta) may be considered, practically, an inert body; it has, however, to be applied to the paper mixed with a vehicle such as size, starch, flour paste, &c., the like, to secure it to the paper. Now, this adhesive substance may not be an inert compound, and it may have a material influence on the keeping qualities of the emulsion film before use, and also on the stability of the finished picture. If the P.O.P. emulsions consisted of chloride of silver, pure and simple, the case might be different, but they also contain ferric nitrate of silver, as well as an organic acid, such as the citric or tartaric. These, with the silver, enter into combination with the sizing material that cements the pigment to the

aper, and often are the cause of the rapid discolouration of the paper. It is often found that the discolouration of P.O.P. is first noticeable on the back, though the emulsion on the front is still white. This is more marked in the case of collodion papers than it is with gelatine ones; but, in either case, it shows that it is not the emulsion that has become discoloured, but the coating on the paper and the paper itself. It may fairly be assumed that, if the pigmented coating and its combination with the constituents of the emulsion is the chief cause of the deterioration of printing-out papers, by keeping, may also be inferred that it may have an important influence on the permanence of the finished picture.

Mr. Aitken, in his paper, did not touch upon this subject, or, of course, it has no reference to the manufacture of the paper itself, but he dwelt upon matters of equal importance to photographers. One of them was the effect that some of the commoner papers, brown paper and the like, used for parcelling plates and emulsion papers, may have on the keeping qualities of the emulsion film, even though it does not come in actual contact with them. Years ago we pointed out that the deterioration of plates packed with an air space between them was largely due to emanations, with changes of temperature, from the paper and boxes in which they were parcelled.

One of the most important points dwelt upon by the author of the paper was the paper of which mounts are composed, and the impurities they often contain. Ultramarine, it is mentioned, is often used to give a tint, or an artificial blueness. Ultramarine is a sulphur compound, readily decomposed by any acid. If a little dilute acid be added to some ultramarine, sulphuretted hydrogen is set free, and will be readily recognised by its smell, and one can easily realise the effect it might have upon a silver picture. A perhaps still more important subject in connexion with paper for photographic mounts is the presence in it of some of the chlorine used, in excess, to destroy the last traces of the chlorine employed in bleaching the pulp, which is hyposulphite of soda. It will be manifest to every one that it is very little use for the photographer to take every precaution to eliminate all traces of the fixing bath from his prints if they are to be afterwards mounted on boards the paper of which contains hypo. Mr. Aitken, in his paper, gives a simple method of testing for hypo, which we here quote: "Boil the suspected paper or mount in distilled water, then evaporate to a convenient bulk, and add a few drops of a solution of nitrate of silver. A brown colouration indicates the presence of hyposulphite." There are other tests for its presence that are perhaps more delicate, but this is a simple and practical one. There are, however, often other materials in paper and mounts than ultramarine and hypo that may affect the stability of silver photographs.

Some years ago Mr. E. W. Foxlee published a very simple method of testing photographic mounts that requires no chemical manipulation whatever. Briefly, it is this: Take an unmounted albumen print, and place it, face downward, on the suspected mount, over one half of which place some insulating material, such as two or three thicknesses of paraffined paper or a thin piece of celluloid, and over this lay a piece of pure paper, say the Saxe or Rives photographic paper, and bind the whole together at one end with a couple of paper-staplers. Now put into a pressure frame with several thicknesses of moistened blotting-paper at the back, and a plate of glass on the top to prevent evaporation of the moisture, and

screw up tightly; keep in a moderately warm place for two or three weeks. We now have one half of the print pressed in close contact with the mount, and the other half protected from it, but all of it kept damp. A silver print, under these conditions, is bound to fade sooner or later; but, if that half which is in contact with the mount shows deterioration before the other, and it sometimes will in two or three days, it is obvious that the mount is the cause. In introducing this method of testing, Mr. Foxlee assumed that photographers were not so much interested in knowing what was the particular material that caused the deterioration, but in learning if the mounts contained anything at all that would injuriously act upon the silver prints put upon them.

Further Eclipse Gossip.—As the 28th approaches, the arrangements as to the eclipse expedition assume a more detailed form, and further official news becomes available. It is satisfactory to learn that most of the foreign Governments concerned are placing as many facilities as possible at the disposal of the observers passing through or into their territories: those of Spain and France form the exception, but official communications from them are daily expected. The Naval Department of the United States will permit instruments to be landed without examination and free of charges, and, if anything should pass into Canada, it will be similarly treated. In Portugal itself, the observer travelling by the State railways from Oporto to Valencia, and also by the narrow-gauge rail to Vezin will be carried free. All travellers going for eclipse observation purposes should be provided with a certificate stating that they are eclipse tourists. At a recent meeting of the British Astronomical Association, Miss Bacon gave details as to the expedition under the leadership of her father to the United States. Wadesborough is the station they have selected, and they are fortunate in having chosen the same locality as that selected by Professor Young, who has offered them the use of his camping ground, with every personal help he or his party can give. Professor Barnard has invited them to visit the Yerkes Observatory. As showing what can be done with comparatively slight photographic apparatus, we may note that at the same meeting one observer stated that he intended to take with him a one-and-a-half inch photographic lens with tele-photographic attachments, and also an ordinary "lantern lens" of ten inches focus. The same observer, Mr. Crommelin, intended to have a snap-shot at an effect not hitherto photographed—the disappearing shadow in the sky after totality. Mr. Evershed intended to use a reflecting telescope for his photographic work, and he believed this had not been done before. He converts his telescope virtually into a prismatic camera, which will have the advantage of giving all rays of the spectrum in focus with only the first adjustment. Using a reflector, he would experience the special advantage of having the aperture admitting the light to the prism close by the side of the plates, so that he could make the exposure with one hand and rack the plates along with the other. It is to be hoped that none of these hopes and plans may be marred by weather difficulties, and especially that the sirocco may not put in an appearance and spoil the observing by reason of the atmospheric haze it would bring about.

A New Perfect Incandescent Burner.—The *Scientific American* descants upon the merits of a new burner which it states is now in use by the Paris authorities. It points out the increase in light emission that follows increase of temperature in the Bunsen burner, which never arrives at a maximum possible, through imperfect mixing of the gases. The new burner obviates this difficulty, and, further, has an arrangement for heating the air before mixing, and so obtaining a higher temperature, which indicates 1800° C. The same article states that in a short time anybody will be at liberty to manufacture these burners, and so, of course, a decrease of price will result.

Experiments with Albumen.—In connexion with some agricultural experiments, Mr. J. Bertland Farmer, M.A., read at a recent meeting of the Royal Society a paper containing much matter of interest to photographers on the drying and coagulation of albumen. The sample he employed came from Merck, of Darmstadt, and was sent as egg albumen. The results he obtained were sufficient to prove that anomalous behaviour at times shown by albumenised paper might be accounted for by changes in the physical condition of the albumen brought about by dehydration. For example, if the albumen employed were put in or attached to a series of drying tubes, and then raised to a temperature of 80° C. for a short time, in two hours the albumen [was completely altered; it became insoluble in water, and, in fact, underwent a process of coagulation. If, however, the albumen be carefully dried before the heating is brought about, which it was stated might be readily done by placing it in an incubator at a temperature of 52° to 55° C., the results were entirely different. Thus dried, the albumen lost its shellac or glue-like appearance, and easily crumbled to small particles. Further experiments, which took the temperature beyond boiling point, still left the dried albumen quite unchanged. It is evident that it would be no difficult matter to expose quantities of albumenised paper to the specified temperature, 80°, which produces insolubility, and it might be worth while to try what would the result be like. The use of weak silver baths possesses certain advantages, but is impossible below a certain strength with ordinary albumenised paper, as the coating of albumen dissolves.

Cellulith.—This is the name given to a substance, lately frequently mentioned in several of our foreign contemporaries, which appears to have properties fitting it for use in the manufacture of photographic trays, &c. One description that we have read points out that, in the making of paper, it is known that, by beating the pulp for a long time, a transparent and elastic substance is obtained, which hardens rapidly on drying, covers the fibres, and imparts great strength to the paper. An amorphous colloidal cellulose hydrate, as supposed, is produced, being set free from the cells, and acting as an agglutinating substance. This is also the theory of the fabrication of vegetable parchment. In parchmenting paper by means of sulphuric acid, the cellulose is transformed into amyloid, which yields, with an excess of water, a gelatinous precipitate, uniting the remaining fibres, and forming a translucent sheet. The description proceeds: "The cellulith is prepared by a process exclusively mechanical, the beating of the pulp for a much longer time than is necessary for the production merely of paper. According to the properties of the pulp and the velocity of the revolving cylinder, the duration of the operation varies from 40 to 150 hours, until all the contents of the vat are transformed into a homogeneous mass having no trace of fibres. In the state of extreme division the material still contains a good deal of air, which may destroy its regularity, so it is submitted to a new beating for about two hours. If the cellulith is to be coloured, the colours, soluble or otherwise, are added before the heating. The hot cellulose liquor is received into a reservoir perforated at the bottom, from which it drips. With ninety-six per cent. of water the consistence is that of thick honey. The water is evaporated either in the open air or in a stove at 40°. The pulp hardens gradually, and finally reaches the consistence of horn. Its specific weight is then about 4·5. The cellulith may be worked like horn, ebonite, and other similar substances, and is, as compared with celluloid, uninflammable. In mixing the cellulith, at the moment of trituration, with sawdust and thirty per cent. of lampblack, a kind of very dark ebonite is obtained, dense and susceptible of a polish."

ON THINGS IN GENERAL.

THERE is no doubt that the Camera Club is a real live society, and some of the best work of the day has its results first published within its walls. Those who were not there have to take their enjoyment second hand, and read in the pages of their BRITISH JOURNAL OF PHOTOGRAPHY some original account of papers read or

discussions carried on, though, I doubt not, many would prefer, for example, to have personally witnessed Mr. Webber's interesting metallurgical experiments; and again he added fresh interest to the ever-green subject, the saving of residues. To my mind, one of the most extraordinary of the aberrations of otherwise trained and business-like minds takes place, and is to be noticed all over the country, on this very topic. "Save your waste toning baths," says Mr. Webber, knowing well, I feel sure, that there is every need to hammer such advice into the brains of the majority—I say, not only of amateurs, but of professionals. Nineteen out of twenty photographers who give any attention to the subject at all save their print-washings, and the bulk of them pride themselves upon their cuteness in so doing. But—and this is a very old, stale, yet ever needing the telling—how many systematically save their gold or collect the silver that is to be found in their waste hypo? Yet here Mr. Webber can inform them what a large proportion of the gold bill is not utilised in the production of a print but, all the same, it usually goes down the sink. Similarly is the used-up hypo solution put to waste. Let me once more point out that in the hypo used for fixing P.O.P., or any silver print, there has always been more silver from a given number of prints than can be extracted from the print-washing; and, what is of more importance still, the silver so extracted always contains a certain amount of gold. Sent to an honest refiner, the price per ounce given for silver from hypo will average ten per cent. (often reaching a higher figure) in excess of that given for print-washings. And again, now that so much ready-sensitised paper, especially the emulsion kinds, is very greatly in vogue, the silver going into the washing water is less than it used to be. Speaking from a practical point of view, my advice to photographers, however, who do not possess experience like Mr. Webber's is: Throw down all the precipitates you can from print-washings and hypo, throw your old toning solutions into the waste hypo jar, collect and dry your precipitates, and don't attempt to do anything more with them, but send them at once to the refiner. One of the largest metallurgical firms in the world charges a sum which does not exceed an average of five or six per cent.; others charge ten; but, even at the latter figure, it is the truest economy not to attempt any crucible work.

Then we had Mr. Burchett's lecturette on composition, remindir one of a good old standard authority of somewhat similar name, Burnett, from which much advantage could be gained by the student and yet he did not advise slavish adherence to rules. I am one with Mr. Humphrey, who was delighted to hear from an artist of Mr. Burchett's eminence that picture-making was possible without sticking to absurd rules (I hardly think Mr. Burchett called them absurd). But I don't think Mr. Humphrey intended to be taken literally when he said no one could seriously contend that the female form was either angular, pyramidal, or circular. He was, I apprehend, speaking of woman in the abstract, and not in the concrete, for I know a good many portrait photographers who would be excessively glad if they had no angular women before their camera, and would find others as nearly circular as makes no matter! The latter would be well enough if they would let the photographer have his own way, but it is well known they won't; they like to look at the sample album, and, selecting some particularly sylph-like girl, declare that that is how they wish to be taken. I will confess, though, that I do not seriously contend that there are any pyramidal women they would be freaks indeed.

We have another fine society in the L.P.P.A., and Mr. Haddon's talk on balances was very interesting. He might perhaps have added with advantage that it was possible to buy sets of grain weights, stamped as correct by authority, at a cost of a few pence extra. Yet stay! It is questionable whether such stamping is as valuable as it sounds. I remember a case some years ago where a chemist was fined for having an incorrect measure in use in spite of his protest and pointing out that this very measure was stamped by the local weights and measures authority—had a Government certificate, in fact; and, further, I know a tradesman who had his doubts about the ability of his local authorities, who had a quarter-ounce weight stamped as correct, put away carefully, wrapped in tissue paper, presented it again for examination twelve months afterwards.

and was informed that it was incorrect. After that he was not surprised when, after sending a block-tin quart measure to be stamped, it really was stamped, stamped clean through the metal, leaving a hole, through which the liquid the measure was intended for steadily trickled out. No, perhaps Mr. Haddon was well advised, after all, to say nothing about "stamping." By the bye, speaking of balances, I have in use at the present time (the instrument having had no special care taken of it), and have had for about fifteen years, a small pair of brass-beam hand scales, which only cost a few shillings, but which will weigh with great accuracy and rapidity to one-fifth of a grain, the fractions of a grain being measured by a sliding rider on one side of the beam. I could not wish for a better or handier instrument for general rough use.

It is very satisfactory to know that the odious Copyright Bill has no chance of being passed this session. It is to be hoped that sufficient organized opposition may be brought into play against its next appearance that shall succeed in getting it rejected. Photographers should combine, and, above all, interview the local M.P.'s on the subject. So far as I can see, the effect of any effort of the Copyright Union has been absolutely *nil*. Speaking of copyright, I am rather surprised the Editor did not express his opinion on the offer of *Country Life* to pay from 5s. to 10s. 6d. for the use of pictures they publish out of sets sent in competition for the prizes that journal offers. True it is that there is some credit to be gained from a reproduction of a photograph in the pages of that splendidly printed journal; but, if a print is worth inclusion in such select pages, it is worth paying for, and 5s. is no payment at all.

There has been much talk lately about photography and the illustrated press. My own belief is that photography in that direction has been a curse to art progress. Of all the vapid, monotonous, un-picturesque, flat, inartistic illustrations ever put into a newspaper, commend me to the average "photo block." I suppose its cheapness has been so great that publishers have succumbed. There is the *Graphic*, at one time the very home and hotbed of high-class wood-engraving; but at the present time it is easy enough to pick up a number which has not a wood-engraving in it from cover to cover—no, I am wrong; we do find wood-engravings, and sometimes very excellent ones, in the advertisement pages. The reason of all this is not far to seek. It is an expansion of the 5s. idea. Some men are so delighted to see their name attached to some twopenny-halfpenny snap-shot that they are only too glad to get it printed for nothing. They would rather pay (not to speak of being paid) to have it put in, and so the papers fatten on their vanity—some papers, that is to say—the latter paper I named is a conspicuous example of honesty in this respect, as far as my knowledge carries me.

I read with much pleasure Mr. Tulloch's paper given before the Dundee Society, and with much of what he said I heartily agree. But surely, when he gave it as his opinion, speaking of double printing having "much to answer for," that "it is beyond the power of man to make a connected whole from parts," he did not remember—to name two artists only—what Rejlander and what H. P. Robinson have done. I have, in a place of honour in my home, a copy of *From Dawn to Sunset*, by the latter artist, which is, to my mind, superior to the work of many a painter both in unity and breadth, and it rings with the true poetic fervour. While speaking of this, I may mention a technical point about it that often strikes me. My copy—I believe it was almost, if not quite, the first finished copy produced (unmounted when I received it)—appears now as bright and free from fading as when it came into my possession, and that cannot be very much under a score of years ago. Yet it is an albumenised paper print. Can any one explain how it is that so many of the more recent albumenised prints fade so quickly? FREE LANCE.

THE PHOTOGRAPHIC WORLD AND THE WAR—AN APPEAL.

So far none of the various war funds that have been raised for the benefit of the sufferers by the prolonged struggle in South Africa has received the contributions of photographers, photographic manufacturers, and dealers as a class. No attempt has been made to enlist the active co-operation of the photographic world as a whole in the good and noble aim of alleviating the pain and suffering caused by the war, although

some satisfaction may be derived from the fact that photographic societies at Manchester, Croydon, and Redhill have held special optical lantern entertainments which resulted in the addition to various war funds of useful little sums of money.

But this is not enough. It has been represented to us that, as some branches of photographic industry have directly profited by the war, it is the duty of photographers, manufacturers, enlargers, &c., to make a special and concerted effort in the direction of materially aiding one of the war funds. That the three classes of photographic producers we have named have been doing increased business on account of the war admits, we believe, of no doubt. The slow movement of 200,000 British troops, and continuous strife for six months, with the consequent loss of thousands in killed and wounded, has laid innumerable claims on the services of photographers and enlargers, while the demands of the Government and private individuals for photographic apparatus and material have been exceedingly great.

The war may last for months, and probably will; but, whatever may be its duration, the further losses by death are bound to be great, and the long list of the widowed and fatherless is destined to be very largely increased. We have been asked to appeal to our readers for their contributions towards the well-administered War Fund of our powerful contemporary, the *Daily Telegraph*, which has made the care of the widowed and fatherless the objects of its special efforts. It is needless to say that we accede to this request with the heartiest pleasure, and we ask our friends and readers all over the country to join us in this noble work.

Every amount, large and small, will be acknowledged in our pages, and the total sums will be forwarded, week by week, to the *Daily Telegraph*.

We trust to receive the co-operation of the great manufacturing firms, professional and amateur photographers, employés, dealers, enlargers, and the many other classes to be found in modern photography, so that the total contributions which the photographic world will make to the *Daily Telegraph* War Fund will be both large and representative.

THE NEWCASTLE CONVENTION.

To the pages of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900 Mr. S. Herbert Fry contributed a short article with the title "On Stopping at Home." It is so admirable a plea to professional photographers to attend the forthcoming Convention at Newcastle in July next that for their especial benefit we consider ourselves amply justified in reproducing it.

"ON STOPPING AT HOME."

"I wonder," wrote Mr. Fry, "how many professional photographers are members of the Photographic Convention? This question has been running in my mind since last July, when I met a professional friend—a veteran and an old friend of my late father's at Gloucester. He put the question to me in a slightly different form. Said he, 'Are there any professionals here?'

"Well, of course there are. Some of the attenders of Convention are professional photographers, many are connected with the business of photography, and more—perhaps the majority—are amateurs. Nevertheless, I think it is a matter for regret that so few of the men who are making the production of photographs the bread-and-butter business of their lives should fail to attend a gathering where the very spirit of photography may be said to breathe.

"A photographer who attends the Convention finds himself an honoured guest in a town whose local authorities have invited him and bidden him welcome; a participant in a week's pleasurable picnic, surrounded by kindred spirits, he is, at his own option, a snap-shutter, a serious worker, or a lazy man watching others toil; and he has a unique opportunity of discussing the whole gamut of new and old methods with all classes of enthusiasts. There is a pass word which serves as an introduction to every one, namely, membership of the Convention, and its yellow badge is the sign of a hail-fellow-well-met.

"Without contrasting the methods and manners of our own Convention with those of our American friends, which Convention I believe to be as largely dominated by the professional as ours is by the amateur element, I believe the English photographer, especially the provincial photographer, would find himself benefited by a week's intercourse with his brethren.

"There are lions, too, at the show; live, pictorial fuzzygraphers; editors who speak as ordinary beings, and not as 'we,' cranks with patent cameras of all sorts, and lady photographers, all intent upon making as many exposures as is possible in the day; and the photographer who can't learn something from them, either what to do or what not to do, what is new and good or what is worthless, must know all there is to know, and more.

"But," says an objector, "what good will all this be to me? When I take a holiday, I want to get away from photography altogether; I want a change of scene and a change of subject, to get upon an entirely fresh tack." Well, I think you will do all this at the Convention. Nothing can be a greater change to a photographer than to be a disinterested and critical observer of other people's methods, of other people doing the work one is accustomed to do oneself. You have no idea how smart a man may be with his camera until you meet a better man than yourself. And there is some comfort, too, in seeing a man fumbling with his apparatus, you feeling sure all the time you could do it better and quicker yourself.

"Now, my contribution to the ALMANAC can be boiled down to a few words: Can you afford to stop at home? Can you afford to run along in the same groove year in and year out? Where will you get most ideas in the shortest time from your fellow-photographers? Well, I say, Can you afford to stop at home?"

AN OLD TELE-OBJECTIVE.

In his interesting account of the history of the tele-objective, Mr. T. R. Dallmeyer* attributes the priority of the principle of this instrument to P. Barlow, 1834, acknowledging, however, I. Porro's claims to be the first to introduce this instrument into photographic use.

By a happy chance, some weeks ago, I came across an old book, printed in Sir I. Newton's time, i.e., A.D. 1686, the title of which I dare hope will be interesting to the readers of THE BRITISH JOURNAL. This title runs thus:

R. P. F. JOANNIS ZAHN CAROLOPOLITANI.

Sacri Candidi Canonici Ordinis Præmonstratensis in Superiori CELLA DEI Profeti,

PRO

EXPLICANDO ET DEMONSTRANDO

OCULO

ARTIFICIALI TELEDIOPTRICO

SIVE

TELESCOPIO,

FUNDAMENTUM II.

MATHEMATICO-DIOPTRICUM.

IN QUO

Comprimis de materiâ & formâ Artificiali apti Diaphani ad perfectionem Oculi Artificialis Teledioptrici:

Deinde de variâ lentium diaphanarum tam inter se quam cum Oculo Naturali combinatione:

Tandem & de ipsis machinis sive instrumentis Teledioptricis cum Oculo Naturali comparatus Methodicè, Genuinè, ac Mathematicè tractatur.

Cum Facultate Superiorum



HERIPOLI,

Sumptibus QUIRINI HEYL, Bibliop. Aulico-Academici.

Præfaturi ad Mspum, Typis JOH. GEORGII DRUMLMANNI.

ANNO M DC LXXXVI.

* Tele-photography (an elementary treatise on the construction and application of the tele-photographic lens). London: William Heinemann, 1899. 148 pp., with 26 plates and 66 diagrams. Cloth, 15s.

The book forms the second part of the *Oculus artificialis teledioptricus sine Telescopium*, by the same author. As seen from the title, the author belonged to the order of the Præmonstratenser Friars, and is said to have become, some years afterwards, Canonicus of this order at Würzburg.

It is remarkable that, at this time, so shortly after the Thirty Years War, and in a dreadfully devastated country, such an interest was being taken in a scientific pursuit. Of course there is no knowledge of highest importance contained in the large folio, but artifices and devices are mentioned which clearly show that the author was by no means devoid of insight and dexterity.

Of special interest for a photographic journal is the treatment of the camera obscura, or "cistula parastatica," as the author sometimes calls it. When I wrote the history of the camera obscura in my *Theory and History of the Photographic Objective*, I derived my knowledge of the prior stages of this instrument mainly from English sources, especially from J. Harris's talented Treatise; and there is no doubt that the final practical perfection and theoretical investigation of this instrument was effected by W. H. Wollaston and G. B. Airy. I had then no means of tracing the development of the camera obscura in Germany, but now the discovery of this volume, and some others found in the mean time, enables me to fill up the gap to a certain extent; we see that the camera obscura as show-box, and later on as drawing apparatus, had a rather wide-spread use in Germany during the end of the seventeenth and in the eighteenth century.

As far as J. Zahn's oculus artificialis is concerned we are surprised at the development of the tele-objective, i.e., a combination of a convex lens of longer and a concave lens of shorter focal length. J. Zahn's theory may follow in the Latin original (the author's text being conscientiously copied with every mistake as well as with the peculiar accentuation), of which I give such a literal translation as I am able:—

COROLLARIUM I.

(*Insignis combinatio Lentis convexae et concavae ad maiorem imaginem procurandum.*)

Specillum concavum ita intra Lentem convexam et ejus imaginem collocatum, dum imaginem trajicit, potest eam exprimere maiorem, quam alia Lens convexa sola qualiscunque ad eandem distantiam. Nam si Lens aliqua convexa sola adhiberetur ad imaginem in eadem distantia exhibendum, si esset plano-convexa, OR foret diameter convexitatis; si convexo-convexa aequaliter utrinque, OR foret semidiameter convexitatis utriusque: radii autem transeuntes per O centrum Lentis convexae, qui determinarent diametrum imaginis forent BOP, AOQ: foret autem PQ diameter imaginis in eadem distantia multo minor diametro KL imaginis per combinationem harum Lentium procurata. Ergo, &c.

COROLLARIUM II.

Hinc discitur secretum et mirum artificium pro cistulis specierum et cameris obscuris in parvâ distantia plurimum imagines tractas amplificandi. Sed de hoc artificio alibi plura.

COROLLARIUM III.

(*Quomodo Tubus brevior aequivalens maiori confici possit.*)

Item patet hinc, quomodo per similem combinationem loco Lentis objectivae longiori distantia imaginem formantis major nihilominus imago in breviori distantia procurari possit, itaque tubus contractior et brevior fieri, qui tamen aequivaleret, immo praestaret tubo longiori cum Lente ordinaria objectivâ.

COROLLARY I.

(A special combination of a convex and concave lens for producing a larger image.)

A concave lens, thus placed between a convex lens and the image formed by it, can in transmitting the image produce it in a larger size than any single lens whatever at the same distance. For if any single convex lens be used in order to produce an image at the same distance, if it be plano-convex, OR would be the diameter of the convex surface; if it be a crossed lens of equal radii, OR would be the radius of each convex surface: but the pencils passing through O, the centre of the convex lens, and which determine the size of the image, would be BOP, AOQ; but the diameter, PQ, of the image at the same distance would be much smaller than the diameter, KL, of the image formed by the combination of these lenses.

COROLLARY II.

From this may be inferred the secret and wonderful artifice used in show boxes and camerae obscuræ to greatly magnify the images transmitted at a short distance. But of this artifice more later on.

COROLLARY III.

(In which manner a shorter tube could be made equivalent to a longer.)

In the same way it stands to reason from the foregoing, in which manner it is possible to produce an image none the less larger by a similar combination at a shorter distance instead of using an objective forming the image at a longer distance; and so a tube which possesses not only the same but even a higher power than a longer tube with an ordinary objective can be made shorter and more convenient.

COROLLARIUM IV.

Quantò specillum cavum caeteris paribus (habito scilicet respectu ad centri ejusdem et imaginis Lenti convexae situm, ut dictum) proprius accedit ad imaginem, tantò penicilli magis distractabuntur, et imago necessariò fit major in longiori distantia; et quantò remotius ab imagine Lentem convexae collocatur, ita ut proprius Lentem convexam accedat, tantò minor imago procuratur in distantia breviori.

The figure appended is a copy of the drawing to be seen on page 132 (fig. 2).

As to the practical use of these theoretical rules he gives some instances in the next volume, *Fundamentum III.*, pp. 219-221. From these we infer that, in accordance with the above Corollary II., the device was

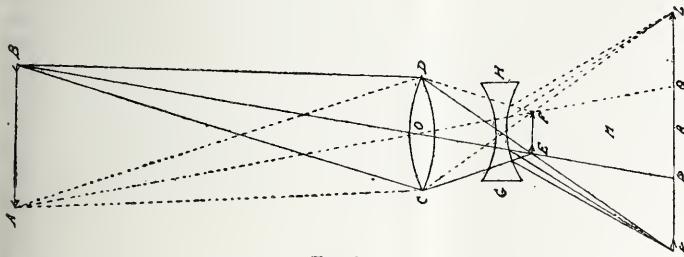


FIG. 2.

planned to magnify the primary image in a camera obscura of a comparatively small length. In order to accomplish this the positive and negative lenses were mounted in two separate telescoping tubes so that their distance could be altered at will. A third tube, holding the above-mentioned, was fixed to the camera obscura and allowed the focussing of the image on the matted surface.

In this way, the author concludes this chapter, we are able to obtain a larger or smaller picture, and at different distances, according as the concave lens is placed nearer or further away from the convex lens.

DR. VON ROHR.

FOREIGN NEWS AND NOTES.

Thermography.—An interesting communication by Dr. R. E. Liesegang appears in the *Physicalische Zeitschrift* concerning the action of heat as the means of obtaining an image. If equal parts of hydroquinone and anhydrous carbonate of soda be moistened with alcohol and rubbed to a thin paste, it will, in the course of a few minutes, turn an intense deep blue colour. This blue substance has the remarkable property of being sensitive to radial heat. By brushing the mixture upon thin writing-paper, and wiping away the excess which is unabsorbed, the blue substance is formed in the fibres of the paper. This paper, when exposed to heat in a gas oven, bleaches in about five seconds. By placing coins, &c., upon the paper, images of their shadows may be obtained. The formation of these images is only retarded a few seconds when the sensitive substance is wrapped in black paper. Dr. Liesegang remarks that he does not know of any substance which by exposure to light changes so rapidly. The normal oxidation of alkaline hydroquinone by exposure to air is characterised by deep brown discolouration. The blue substance seems to be an intermediate stage of oxidation. The colour immediately disappears when the substance is moistened with alcohol or water, and it does not reappear when dried again, ether does not affect it. The paper in the sensitive state will only keep a few days. Herr Gaedicke makes a few remarks concerning the above in the *Photographische Wochenblatt*. He says this intense blue compound may also be prepared by rubbing hydroquinone and calcined potash together in the dry state. If the dry mixture is rubbed upon blotting-paper and exposed to the radiant heat emitted through the windows of an anthracite stove, in about three minutes it will turn green. If a silver coin be placed upon the paper, it will quickly get very hot, and the compound will turn brown. The blue colour of the compound seems to be due to the presence of a certain amount of water, easily dissipated by heat. When this takes place, the colour changes to brown. Hydroquinone, rubbed down with effervescent soda and moistened with a little alcohol (ninety-five per cent.), does not show any blue colouration when brushed upon paper, but remains colourless.

COROLLARY IV.

The nearer the concave lens coeteris paribus (we must, as already mentioned, take into consideration the situation of its centre and of the image formed by the convex lens) approaches the image, the more the pencils are lengthened, and the image necessarily becomes larger at a greater distance; and the further it be placed from the image formed by the convex lens, so that it approaches this convex lens, the smaller an image will be formed at a shorter distance.

Metol-hydroquinone.—H. Quatz, writing in the *Atelier des Photographen*, recommends the following formula, which, subject to various modifications, may be taken as a stock solution for many kinds of development:—

No. 1.	
Water	500 c. c.
Metol.....	5 grammes.
Hydroquinone	1 gramme.
Bromide of potassium (ten per cent. solution)	60 drops.
Hyposulphite of soda (ten per cent. solution)	60 "

No. 2.	
Carbonate of potash	20 grammes.
Water	250 c. c.

The addition of hyposulphite of soda has a retarding action, and keeps the shadows clear in the case of over-exposure. In development with ferrous oxalate its action is the opposite, being in that case an accelerator and producer of fog. For instantaneous exposures, take 3 parts of No. 1 and 1 part of No. 2. For time exposures, or where over-exposure is suspected, begin with a small quantity of alkali, say 10 parts of No. 1 to 1 part of No. 2, increasing the latter as may be thought desirable. Development begins at once in the case of instantaneous exposures, and it is complete in two or three minutes. Several plates may be developed in succession in the same solution, which does not lose its activity. A mixture of old and new developer may be used with much advantage for time exposures. The developer may also be used for Velox paper. For the carbon variety use 3 parts of No. 1 and 1 part of No. 2, and for special portrait add an equal quantity of water. In the latter case development is slower, and the pictures show more contrast than with the developer recommended by the makers of the paper. For bromide paper, take 3 parts of No. 1 and 1 part of No. 2, and dilute with five times the quantity of water. Lantern plates may be developed with 6 parts of No. 1, 1 part of No. 2, and 7 parts of water. The tone may be modified by varying the strength of the developer. Black tones may be secured with a concentrated developer, whilst the addition of water tends to warm brown tones.

The Berlin Exhibition.—We have been requested by the President of the Deutscher Photographen Verein to inform our readers that an Exhibition will be held at Berlin during the next Convention, to take place in the month of August. The Exhibition will be held under the patronage of T.I.H. the German Emperor and Empress, and promises to be of more than usual importance. We notice that a number of German manufacturers of photographic lenses, plates, and other photographic requisites are supporting the Exhibition in a liberal manner by offering prizes. The President, Herr K. Schwier, of Weimar, will be happy to forward programmes upon application.

Copying Drawings and Engravings.—The *Wiener Freie Photographen Zeitung* draws attention to an old process, due to Nièpce de St. Victor, but which is very little known. It may be used even for engravings printed on both sides. Soak the prints for a few minutes in water to which a little ammonia has been added, then draw them through water slightly acidified with sulphuric acid and dry them. Expose them for five minutes over a dish to the fumes of iodine at a temperature of 12° to 16° R. This impregnates the ink, but not the paper. The surface upon which it is desired to copy the engraving should be prepared with a solution of starch and dried. Before printing, prepare the starch surface by damping it with blotting-paper soaked in water acidulated slightly with sulphuric acid. Place the engraving face downwards upon the starched surface, lay several sheets of soft paper upon it, and bring the surface of the print in contact with the starch by means of pressure. An image is thus formed in iodide of starch, which may be fixed by first drawing it through a solution of nitrate of silver, exposing it for a few seconds to light, and then developing with a solution of gallic acid. Fix with hyposulphite of soda. The image is reversed. By this process negatives may be made upon glass coated with albumen or gelatine.

Insurance by Picture Post Card.—According to the *Revue Suisse*, the latest development of the mania for picture post cards is the insurance of the recipient against accident. By payment of a premium of 5 francs for a hundred picture post cards,

the addressee becomes entitled to an insurance for 50*l.* in the event of death, or 10*s.* per week in the event of injury. Bicyclists are only entitled to half these sums. The contract is worded as follows: "This card must bear the impress of a post office stamp, and entitles the person whose name it bears to the sum of 50*l.* in the event of accident, followed by death within three months, if the same shall have happened to him upon a journey for which money has been paid, whether by train, tramway, stage coach, omnibus, or steamer. In the event of injury, not followed by death, the Company will pay to the said person 10*s.* per week, whilst incapacitated for work, during the period of eight weeks dating from the fortieth day after the accident occurred. In the event of accident to bicyclists (racing excepted), the amount of compensation shall be reduced by one-half. The insurance shall begin at midnight of the date of the post-mark, and shall be valid for thirty days. It shall not take effect after the 1st January, 1903."

PORTEAGE OF IMPEDIMENTA FOR THE PEDESTRIAN PHOTOGRAPHER AND THE MAKING OF HIS CAMERA CASE.

To peruse the pages of the photographic press from week to week, a stranger to the ways of photographers (if such exists!) would go away with the impression that now the camera is not used apart from the cycle. One ingenious article after another appears claiming to put forward the latest "best" method of camera carrying on a cycle, but similar hints to the older-fashioned pedestrian brother of the camera are almost totally ignored, as though such an anomaly no longer existed. But we walkers are not in the British Museum yet—not yet there labelled as specimens of an extinct species for the eyes of the curious or antiquarian to gaze on. Some photographers are yet sufficiently conservative to prefer Shanks's mare to the most luxurious of cycles, and are even bold enough to hold the daring opinion that, whatever advantages may exist in the bicycle, still walking has also a few to compensate for any disadvantages of speed or some inconveniences the former may possess. The cycling photographer apparently does not go in for very weighty apparatus (as indeed how can he?), and presumably any camera over half-plate would be out of the question. As there are still some amongst us who prefer something originally larger than quarter-plate, and a camera with a larger sphere of usefulness than the hand variety, the majority of these, if not from choice, being debarred from the cycle for the above reasons, must do some walking, as trains do not go everywhere, and since the chartering of carriages or motor cars is apt to deplete the

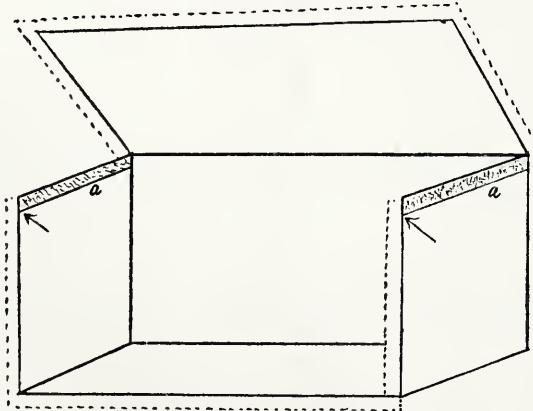


Fig. 1.—Box cut to serve as case. *a* Here only edges of flannelette are glued down over the edge. Dotted lines represent free flannelette edge.

pockets for pedestrians, this article is written by one who for years has spent days and weeks on photographic tramps, and therefore can speak, from practical and personal experience, of every kind of porterage for impedimenta weighing up to twenty pounds on occasion.

Now, there exists a good deal of choice as to the precise manner in which the camera shall be carried, and at the outset the first consideration is as to what shape the camera case shall take. For short excursions from home, undoubtedly the most convenient and lightest receptacle (if, at the same time, its unprofessional and not over-imposing looks be not considered an objection to its adoption) is one of those neat feather-weight rush baskets of which so many patterns abound. These well-known white ones can be had in any size (in fact, many seem just made for camera and slides side by side) and are very cheap; but, perhaps, more preferable and even lighter, yet equally as strong, are those open-work unbleached rush baskets with leather handles; they "look better" for the purpose, to the writer's mind, if looks ought to be considered. A visit to any basket shop will, however, doubtless reveal many suitable patterns, but perhaps it may be mentioned that such a one as the latter described, 14 x 10 inches, costing a 1*s.*, takes a half-plate camera, three

dark slides, lenses, note books, &c., and the tripod laying along the top easily, the basket being lined with the focussing cloth, to protect all from dust, &c.

Some persons, however, prefer to divide their load, and balance half of the burden against the other half. For them a couple of school satchels (waterproof, from 1*s.* a piece), one for the camera, the other for the slides, &c., are the things to purchase, and these can be carried in each hand, or slung one across each shoulder on either side. But, of course, these satchels, if affording slightly more protection than the baskets, are equally with them of no use for travelling about with, as, obviously, their construction (particularly of the open baskets) is not such as fits them for hard wear and tear as part of one's personal luggage. Therefore, for other than home use, a more substantial (and more orthodox!) article should be purchased, of which the most convenient shape will almost invariably be found to be that of the oblong in opposition to the square. Then, too, as this case is to be brought to withstand weather, all kinds of portage, and every other vexation, a stout article should be chosen in preference to the lighter (and cheaper) limp canvas cases. Leather, if most durable, is rather too expensive for most pockets, but very serviceable stiffened canvas baize-lined cases can be purchased at a price by no means ruinous. But what is better than to make a case oneself, in the manufacture of which one's own particular requirements or likes can be studied, as in no other way, unless the expensive one of having a case made to order? The writer rejoices in an eminently respectable black home-made case, which cost a very small sum in the making, and is said by competent critics to be a very nice-looking article (which cannot always be said of "home-made" affairs); has stood any amount of buffettings, still being none the worse for them; is waterproof; can be made to look like new again, with a fresh coat of enamel; and which, finally, can be carried in the hand, slung over the shoulders, carried knapsack fashion, or can run on wheels at will, and

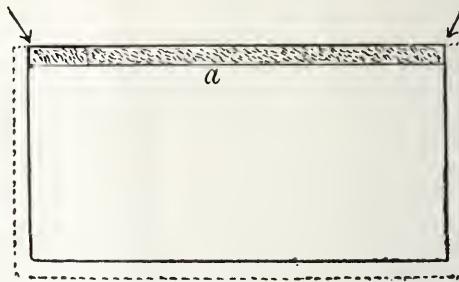


Fig. 2.—Outside of box lid to form side of case, and ready for sewing in position, as indicated by arrows. *a* and dotted lines as in fig. 1.

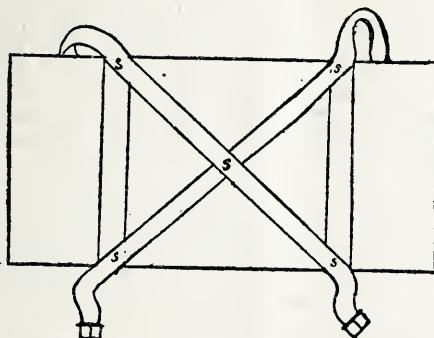
all with equal comfort. Perhaps it is only the maker's vanity which causes it to be regarded as an ideal camera case; but, be that as it may, it certainly admits of every possible method of portage adapted to all circumstances and to every one's fancy, and on this account the reader may like to hear how such a one may be simply manufactured, and of course he can omit any feature which may not meet with his approval or wants.

By far the most convenient foundation—saving the expense of mill-board sheets and the subsequent trouble of cutting out—is a cardboard box of dimensions suitable to your camera (and it is wonderful how exactly suitable such boxes can be had), which your women-folk can get for you free of cost from the drapery establishment they patronise. Since of necessity readers of this article will be users of every size of camera, it seems the better course to speak generally, not confining oneself to any particular size, but writing in such a way as shall be equally useful to him who contemplates making a case for his whole-plate as for him who means to do the same for his quarter-plate. Obviously some recommendations would only apply to weighty cameras, but still, in the matter of the actual case-making, only the measurements will differ, the details being, of course, common to all sizes. But, just to give some idea of how far materials will go, it may be said that one yard of flannelette (costing 4*d.* the yard at the outside, being named as the cheapest material which commends itself as suited to the purpose) will be ample to line a case large enough to take a whole-plate outfit; and the same quantity of "apron linen" (which runs wider), at the same outlay, will more than suffice to cover the same-sized case. To prepare the box for use, one of its long sides will have to be cut down at each end to form the lid of the case, while the original box lid will serve as the side of the case, as shown in the accompanying cuts.

It would be somewhat difficult to precisely describe how the case is to be lined and covered, and even if these proceedings were minutely detailed, they would appear to the reader so formidable as might possibly lead to discouraging him from the attempt. Therefore, since every one's own eyesight and common sense will be his best guide in the actual cutting of the lining and covering, minutiae as to the way will not be gone into, but just only what is necessary said in order to give a clear idea of what is meant, which will be all the assistance required. Perhaps it may be here remarked as some encouragement that the whole of the work is quite a

straightforward, easy, and speedily accomplished task. First of all, the box is to be lined with the flannelette, which is glued down piece by piece, wherever a join is necessary and no selvedge available, turning in the material so as to make a neat finish. The glue should be thin, but not watery, in which case it would penetrate the flannelette and impart a dirty, untidy appearance to the whole. The best method is to allow the glue to just get tacky after spreading, before pressing down the flannelette upon it. About an inch of the stuff should be allowed to project over the edge of the box all round, quite free and not glued over the edges, save at the tops of the two ends (all shown in fig. 1), and for the following purpose. When the box is thus treated, it will be minus a front, as will the lid of the case lack the flaps it must have to complete it. The original box lid deprived of its edging (to be used hereafter) must now be lined to form the front of the camera case. The flannelette is turned back over what will be the top, or free edge of the front of the case, in the same way as was done at *a* in fig. 1, but all the other sides have the projecting inch of material (see fig. 2). This side being lined as above is placed in position in the box (the arrows in figs. 1 and 2 being made to coincide), and then a needle and thread are brought into requisition to strongly stitch one to the other all the way round—a very simple proceeding, for the needle is simply passed in and out in the manner known as "back-stitching," which expression, if the male reader does not understand, since it can hardly be explained in words, the nearest member of the opposite sex will be able to practically demonstrate. Then the spare piece of the underneath flannelette flap, which has just been sewn to the top one, is cut off close (but not so as to endanger the stitching), and the remaining (top) flap all the way round glued down over the sides to make a strong joint.

To complete the actual case itself, only the lid has to be finished, and in all probability the cardboard edge, which has been stripped off the box lid, will serve the purpose of its edging; or, if not long or deep enough a strip of cardboard (one inch wide) of a sufficient length to go right round the lid, must be cut, with a triangular piece cut off each end to slope in towards the case. This has to be lined in the same way as was the erstwhile full front of the case with flannelette, pasting over the



Back view of knapsack attachment fitted to the camera case, sewed at *s*.

latter for the finished edge and the ends, and leaving a free margin at the top by which to sew it all round the lid by its free edge, to which it is stretched in precisely the same way as was the aforementioned side, and similarly finishing off by glueing down over the join. Before covering the case, a stout piece of millboard, and of the same size, should be glued to the bottom of the case to strengthen it there. Then the apron linen is to be glued on as a covering—not a hard matter. The joins should be made to come exactly at the edges of the case, as here they will be hardly noticeable, as the material permits of very neat manipulation, even when it has to be turned in.

Before putting the case into the hands of the saddlers and ironmongers, two strips of hard wood, about $1 \times \frac{1}{2}$ inch, should be screwed at about two inches from either end of the bottom of the case. Now it is ready for the affixing of the straps, which the saddler will provide, as well as make the sling for carrying the case over the shoulder. Two straps will be required to run round the case; they are kept in place at the back by loops, and connected by a handle at the top, which handle should be riveted to the straps—not to the case lid of which they would then soon prove the destruction—to prevent its loss. (It is convenient if these straps be made long enough to take the tripod, lying on the top of the case as well.) At either end of the case buckles should be sewn for attaching the sling of broad webbing, which should be capable of alteration by having a buckle in the centre wherewith to loosen or tighten the length when slung, or about to be slung, as required. As the strap handle serves for general carrying, and, attached as recommended, does not wrench the lid, the sling may not always be required, wherefore its detachability. One half is used as the means of drawing along the case when mounted on its wheels. When the saddler has done his part, the ironmonger will rivet on a hasp and eye through which a letter lock can pass. This the writer considers the best securing for the purpose, as there is no fear of a lost key, and only the one in possession of the mystic word can open the lock.

Now for the affixing of the wheels, the use of which no one would believe was such a boon until one had made practical experience of

them on a long day's tour. Four small iron wheels about four inches in diameter, costing approximately 3d. a piece, are first selected, and these are kept in their axles by split pins (as, of course, the wheels and axles must be detachable for convenience of packing), the axles being flat to admit of screwing them in to the bottom of the case, and having shoulders to the rounded ends, round which the wheels revolve to prevent them rubbing against the case. The axles (which, together with the wheels, should be enamelled to prevent rust) fit over two bolts a piece, screwed through the wooden strips and secured by nuts *outside*, which a spanner tightens up, unless winged ones be used—perhaps more convenient. The writer first tried thumb-screws, but these worked out in a very few moments though most tightly screwed, whereas with the bolts and nuts the camera case has been pulled along over rough roads for a day without a symptom of the nuts loosening. When not in use, the wheels, axles, pins, and spanner (through which a hole should be drilled) can most conveniently be strung together, and carried thus ready for use; they are affixed with no trouble, and quite quickly enough, and as readily detached.

To revert to the sling, which, it should be almost unnecessary to remark, should be sufficiently broad to prevent cutting into the shoulders, since this is why it is to be preferred to a strap for slinging, and the sling, with the straps, should be the same colour as the case is to be when finished. This latter, in its raw state, is quite "a gentleman in (pale) khaki," but requires three coats of enamel to make it durable and waterproof. Of course the maker can select his own colour—to be patriotic and in the fashion, khaki (with perhaps his initials in the tricolour thereon); or, if one has not fashionable, though not necessarily unpatriotic, tastes, he will probably consider black or brown the best colours.

Before applying the selected paint, the apron linen must be sized, for which purpose a stiff starch paste serves very well, being handy and not having the evil smell of size; then, when this is dry, the enamel can be applied evenly and thinly, waiting till one coat is dry before proceeding to another.

It only now remains to describe a knapsack attachment, though this the writer confesses to have altogether rejected in favour of the wheels; but in a rough hilly country, where these, perhaps, could not be used, the knapsack would be the best thing to replace them. Buy as many yards as the measurements of your camera case (and your own proportions of chest) require of the same webbing of which your sling has been made, and with it four large buckles to complete the materials wanted for its construction. This will make a detachable attachment which will not pull out the back of the camera case, as those attached thereto not unfrequently do. Cut two lengths of webbing to go, like the straps, right round the case, and fasten in the front with a buckle a piece, these, of course, being sewn to one end (the top); then two more lengths, long enough, when affixed to the webbing at the back of the camera case (as in fig. 3), to go over the shoulder and under the arm, and fastening with the buckles in front. Though it is fairly obvious that, on a long day's tramp, it is a great advantage to be able to vary one's method of carrying, &c., to suit both the locality and one's moods, still, if every reader of this article only finds one method of these ways of portage to his fancy, the writer will not have written in vain. SEMPER EADEM.

AN IMPROVEMENT IN PHOTOGRAPHIC ROLL FILMS.

[Patent No. 2770 of 1900.]

This invention of the Actien-Gesellschaft für Anilin Fabrikation, of Berlin, consists in coating the wrapper which comes into direct contact with the sensitised surface of the film with a thin layer impermeable to water. This layer prevents injuries to the film through atmospheric moisture, or through such ingredients of the covering body as might be obnoxious. It likewise prevents the marks and figures printed on the wrapper from being transferred to the sensitised surface.

In order to carry out the invention, the enveloping body is coated with collodion, or with such solutions of resin as, after evaporation of the solvent, yield a layer impermeable to water.

THORNTON'S IMPROVEMENTS IN THE JOINTING OF METALLIC BOXES, CAMERAS, SHUTTERS, &c.

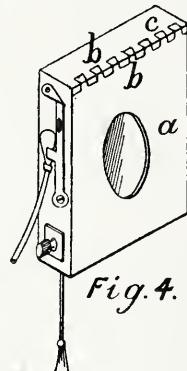
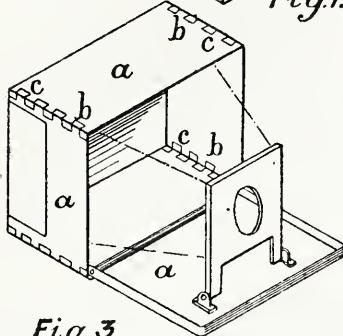
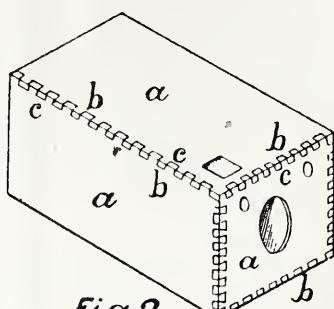
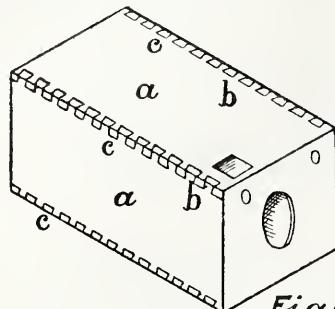
[Patent No. 7360 of 1899.]

The invention consists essentially of a box, case, or the like, formed or constructed with curved or bent dovetailed corner pieces, which engage with each other (not in the thickness of the metal) in the same curved surface or plane.

The sheets, *a*, from which the case or structure is made, may be of aluminium, iron, steel, tin, brass, copper, or other metal or alloy, and are stamped out in blanks of the required shape.

The edges which are to come together to form the connexions or joints at the corners (or elsewhere) are stamped with interlocking or dovetail projections, *b*, alternating with recesses or notches, *c*, of corresponding shape.

When the blank is raised or stamped into shape for a rectangular case or structure, the interlocking dovetail projections, *b*, are bent or carried round the corner from one side, and the corresponding projections on the other edge are bent or carried round the corner from the opposite side,



the projections, *b*, on one side engaging and fitting closely into the recesses or notches, *c*, on the other side, thus forming a dovetail joint, not in the thickness of the metal, but flat, or in the same curved plane.

The two parts, after being fitted into position, are tightly pressed, and so rendered secure.

IMPROVEMENTS IN PAPER FOR PHOTOGRAPHIC PURPOSES.

[Patent No. 12,585 of 1899.]

The patentees, the Rotary Photographic Co., point out, that, as usually prepared, papers for use in producing positives have one side coated or treated with a more or less solid dressing of baryta or lime for the purpose of supporting the sensitive layer which is to be afterwards applied. If this supporting medium be not used, the chemicals will penetrate the grain or fibre of the paper, with the result of producing an ineffective and indistinct picture.

In the Company's invention this supporting medium can be entirely dispensed with, for the reason that, once the gelatine or albumen solution, or the like serving as the support or vehicle for the sensitive salts, has become solidified on one side, the emulsion subsequently applied to the other side will be prevented by the first coating from penetrating the thin paper.

There is no difficulty in obtaining distinct copies in the printing-out process with the present paper, for the reason that, on exposing the front surface to the light, the transparency of the paper enables the light to practically simultaneously reach the emulsion on the back surface. The finished picture on one side of the paper is therefore enhanced by the finished image on the other side, though the latter is less intense than the former. A further result of this double treatment of the paper is that it allows of a reduction in the period of exposure, a fact which, in certain operations, as, for instance, for enlargements, is of considerable importance.

By using two emulsions of a different character the use of separate papers for negatives of different character or density may be avoided. For instance, one side of the paper may be prepared with a soft and highly sensitive emulsion, and the other with a highly contrasting and less sensitive emulsion, so that a substitute for two papers varying in sensitiveness is provided. Owing to the different densities of the shadows and depths of the images on both sides of the paper, it will, when looked through, present a very complete representation of the image upon it. In the case of such transparent positives the paper so treated acts as a deadened plate when seen through, so that the auxiliary devices which have heretofore been employed, such as ground glass, milk, or opal glass, or the like, to act as a base, may be dispensed with.

CAPTAIN DAVIDSON'S IMPROVEMENTS IN CAMERAS FOR THREE-COLOUR PHOTOGRAPHY.

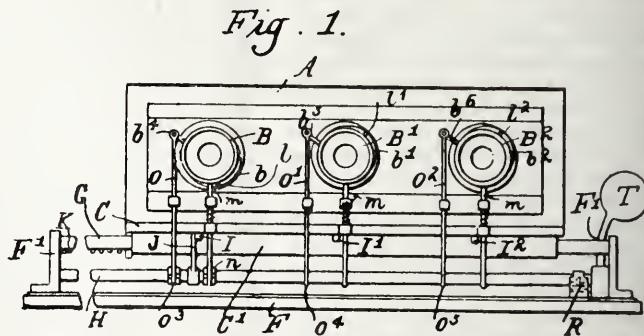
[Patent No. 15,444 of 1899.]

The lenses are each applied with a different colour-filtering screen, in order to obtain negatives of the relative values of the colours filtering by the aid of the lenses and screens.

The colour-filtering screens—light red, blue-violet, and green or yellow respectively—are preferably of optical ground glass, but may be of dyed celluloid or other transparent material.

Each lens has a different-sized aperture, the lens with the red screen having the largest, that with the blue-violet screen the smallest, and that with the green or yellow screen a medium stop.

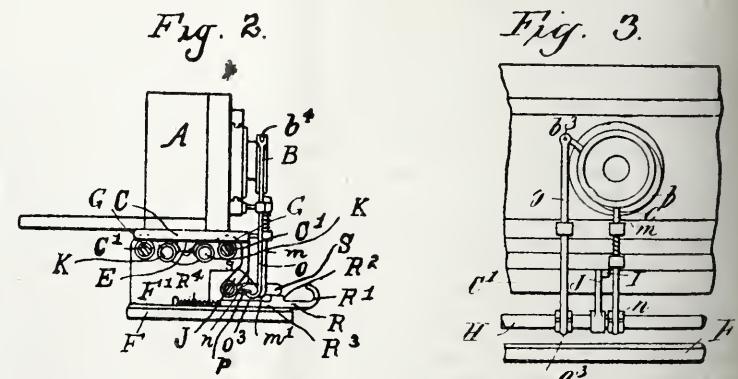
The camera, *A*, is provided with the three lens openings, *B* *B'* *B''*, and is divided internally into three compartments by partitions between the



lenses, so that three similar negatives can be obtained either on one long plate or on three separate plates fitted one behind each lens. The lenses, *B* *B'* *B''*, are provided with the requisite colour screens, as above described, and, by means of stops, the aperture in each case is regulated to give the required proportion according to the colour to which each lens applies. The colour screens may be slipped in suitable holders at the back of the lenses, or they may be passed between the combination in the case of rectilinear lenses, or in front or behind of the lens in the case of a single lens. The actual arrangement employed is not material to this invention, as the various arrangements indicated are well known.

The camera, *A*, is fitted upon a sliding carriage, *c*, attached by means of thumb screws, *E*, or the like. The baseboard, *F*, is provided with standards, *F* *F'*, at each end supporting rods, *G* *G'*. Tubes, *c* *c'*, on the sliding carriage, *c*, are adapted to slide upon the rods, *G* *G'*.

Lengthwise of the baseboard, *F*, a rod, *H*, is arranged, supported in suitable bearings, and operated by means of a rubber press ball, *T*, to

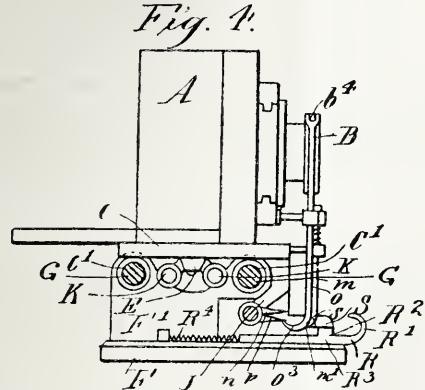


cause a vibration through a small angle. Three catches, *I* *I'* *I''*, are arranged upon the under side of the carriage, *c*, and a side rod, *J*, is arranged upon the rod, *H*, in such position that the camera, *A*, being moved, it will be stopped at three different positions by means of the engagement of said rod, *J*, with one or other of the catches, *I* *I'* *I''*, at the positions necessary to bring each of the lenses, *B* *B'* *B''*, in turn into the proper position for exposure. Spiral springs, *K*, attached at one end to one of the standards, *F*, and at their other ends to the sliding carriage, *c*, cause the movement of the camera along from one position to another, as permitted by the rod, *J*, as will be hereinafter described.

The lenses, *B* *B'* *B''*, are provided with the shutters, *b* *b'* *b''*, having an aperture which, as it passes before each lens, will give the necessary exposure. Springs in each case serve to cause the movement of each shutter as soon as released. The catches, *b* *b'* *b''*, serve to release each shutter when pressed in a manner well known. Each of the shutters, *b* *b'* *b''*, is provided with a pin, *l* *l'* *l''*, and, in order to stop each shutter at the exposing position, to allow for time exposure, spring rods, *m*, are mounted in suitable brackets, so that their ends will come in the path of the pins, *l* *l'* *l''*, and will stop the shutters at the exposing position. The

lower ends of the spring rods, m , are provided with extensions, m^1 , upon which a projection, n , upon the rod, H , can press. The rods, $o^1 o^2$, are connected to the other shutter catches, $b^4 b^5 b^6$, and side projections, $o^3 o^4 o^5$, are provided, upon which another projection, p , upon the rod, H , can press.

At a suitable position on the framing, a sliding piece, R , is mounted,



having a finger piece, R^1 . At its other end it is cut away slightly, so that the portion, R^2 , is at a lower level than the portion R^3 . A spring, R^4 , serves to return it to its proper position after each operation. A projection, s , on the rod, H , is adapted to bear nominally on the higher portion, R^3 , but, when the sliding piece, R , is moved outwardly, will move through further until it bears upon the lower portion, R^2 .

ON THE PRODUCTION OF SILVER PRINTS WITHOUT TONING.

I.

A SILVER print, considered simply as such, and judged from a purely technical point of view, altogether apart from any value which may attach to it from extrinsic causes, is, I think, dependent upon two things for the place it is found to hold in popular estimation.

Of these the one is its appearance, whilst the other, of quite equal importance, is its permanence, a term here merely relative, no doubt, but none the less real.

Both considerations are, accordingly, of the utmost consequence to the printer. Knowing that, by reference to them, the merits, other than pictorial, of a print are usually estimated, the photographer, however much he may be disposed to depart from the traditional lines of manipulation, cannot afford to be neglectful of either. To them also, as a necessary consequence, other considerations not without weight, as, for instance, increased time and cost, and the difficulties attending the working of particular printing processes, are in practice largely subordinated. The latter are, we may suppose, looked upon as evils for which no remedy exists, and as restraints of which the printer would be glad to rid himself could he accomplish this without the sacrifice of the two characteristics which determine a good silver print.

Admitting this to be so, I have often wondered why the task of devising cheaper and simpler modifications of our existing processes for printing in this medium has received so little attention from those engaged in photographic work of an experimental character. One would think that the subject, being essentially of practical utility, would appeal to such investigators. Our ordinary silver processes, whilst much may be said in their praise, are both tedious and relatively costly. Our results, I grant, are remarkable for their excellence, but that, satisfactory though it may be to those of contented mind, is not the point at issue. The question really resolves itself into this, Cannot results equally excellent be obtained with less outlay, with less expenditure of time, trouble, or money, as the case may be? Of course, the answer may be in the negative as well as in the affirmative; but, in the absence of the experimental data necessary to decide this point, we are not justified in coming to either conclusion on *a priori* grounds alone. For this reason, then, it is somewhat to be regretted that there is so little tangible evidence at command to enable the photographer to speak with authority upon a point so vital to his interests. We must not, however, overlook the fact that, from indirect sources, it is possible to glean some information which may serve as a starting-point to beginners in this investigation.

Taking the matter of permanence first, let us avail ourselves of the facts furnished us by our daily experience. It is usually contended, and, I think, with much reason, that, of two silver prints, the first of which has been toned with gold, fixed, and properly washed, and the second merely fixed and washed without toning, that which has received the deposit of gold will prove the more lasting. There is, indeed, such an abundance of convincing evidence of an experimental character avail-

able in proof of this proposition, that it may well be regarded as incontrovertible. The evidence, in point of fact, dates from that period in the early days of photography when prints on paper supplanted collodion positives on glass.

Unfortunately, however, the proposition, simple as it appears at first sight, is not always rightly understood. It has already been said that the term, permanence, in the case of a silver print is merely a relative one. Unless we are careful to bear this fact always in mind, we may be tempted to argue that, because the "life" of an untoned print is admittedly shorter than that of one which has been toned with gold, in the first place, therefore, gold-toning is necessary to permanence, and in the second place, that untoned prints are necessarily evanescent. Neither conclusion is supported by experience. All that practice really teaches us is that the use of gold solutions for toning purposes serves to increase the permanence of the prints. We are not entitled to regard it as essential to that permanence unless proof is forthcoming in support of the assertion that silver prints not so treated are more than ordinarily short-lived. As a matter of fact, however, nothing in the nature of such proof can be brought forward. All the evidence points to a very different conclusion. Take, for instance, the deservedly popular gelatino-bromide paper printing process. In the vast majority of cases, prints in this medium are produced by simple development, without toning of any kind. Yet the permanence, always using that word in a relative sense, of these prints has, by the evidence of time, been very convincingly demonstrated, and is now, I think, pretty generally admitted.

Gold-toning, then, is not essential to permanence, though it remains none the less true that a gold-toned print is, in general, more lasting than an untoned silver one, from the circumstance that, of the two, the more costly metal is less liable to suffer change through the operation of chemical agencies.

The question of permanence being thus disposed of, the matter of the appearance of the print next claims our attention. Viewing the subject in its practical aspect, it seems to be pretty generally agreed that some form of toning for silver prints (excluding, perhaps, those produced by development) is, on aesthetic grounds, a necessity. Such a conclusion, however, will hardly bear the test of rigid analysis. Its character is at best tentative and provisional. We may, notwithstanding, accept it in a restricted sense, making it an expression of the state of our present knowledge of the facts, and regarding it always as a proposition which we shall have to qualify in the light of a wider and more discriminating experience.

There is certainly a very intimate connexion between toning, using that word in its common acceptance, and the appearance of the finished silver print. It would, indeed, be strange were it otherwise. The existing printing-out processes in which silver is the sensitive medium do not exhibit much diversity of character. We find in each case that there is very little departure from certain hard-and-fast rules which have been formulated for us by our predecessors in the field, whether it be in the matter of the actual formulae employed or in the conditions laid down for the working out of the process. The bearing of this on the relationship of toning to the appearance of the print is, of course, very evident. Amongst the rules given for the successful working of these processes, toning occupies a leading place, and this simply because, without its aid, it has been found impossible to produce a really good silver print upon paper prepared according to the orthodox formulae. These formulae being, as has been said, nearly identical in character, the result in all cases, is necessarily the same. Consequently, the process of toning has been somewhat unduly exalted, a recourse to it having come to be looked at as one of the conditions indispensable to success.

My readers (assuming them to have taken the trouble to follow me thus far) will readily see that such a conclusion cannot be regarded as inevitable, inasmuch as it rests upon insufficient data. All that can safely be said upon this head is that toning is found to be indispensable under certain defined conditions, from which we are careful not to depart. It by no means follows, however, that when we cease to observe these conditions, or that when we alter them, or substitute others for them, all of which things we are, of course, at perfect liberty to do, it by no means follows, I say, that, under the changed circumstances, toning will continue to occupy its old place as a determining factor. Let me here cite, as possessing a bearing on the point at issue, one or two facts which serve to demonstrate that, even in the case of a silver print produced in the usual way, the beauty of the result cannot be attributed to the toning alone. Take the case of an untoned print upon gelatino-chloride paper. Its appearance, when fresh from the printing frame, is, I venture to say, and I think most will admit, as rich and beautiful in its way as any gold-toned print can be. In a few cases, perhaps, the colour may not be so agreeable as that of a toned print, though this circumstance has of late years been much less noticeable than formerly. With the better brands of paper, and when printing in diffused light is the invariable rule, such crudeness is seldom apparent. Though not lasting, this beauty of what we may regard as the type of the modern silver print sufficiently shows that, in so far as appearances are concerned, silver compounds are as capable of holding their own as those of gold.

Conversely, let us for a moment consider that rarer type of the skill and intelligence of the photographer, the gold print. By the term I must not be understood to mean the silver print in its final state, after it

has been coated with gold by treatment in the toning bath. The expression is to be interpreted as indicating that species of picture obtained by the direct action of light upon paper sensitised with a compound of gold. As the action is comparatively slow when a gold salt alone is employed, it is generally found necessary to combine with the chosen compound a body of a more sensitive character, such, for instance, as ferric oxalate. On exposure to light, the oxalate undergoes speedy decomposition, as in the process of platinotype printing, the change being accompanied by the formation of an image in metallic gold, due to the simultaneous disintegration of the associated salt.

Now, the appearance of a print produced in this way is not of that surpassing degree of excellence which we might be led to expect by an experience derived merely from the use of gold solutions for toning purposes. Any merit that a gold print may possess must be attributed to its colour alone. In that combination of richness and depth with extreme delicacy of effect, with which all silver printers are familiar, a print in this medium is utterly lacking. The general effect, indeed, as often as not, is somewhat dull and flat, particularly in the half-tones. Weakness is another feature characteristic of the gold print, though, perhaps, this defect may in some measure be due to the difficulties of manipulation having been only imperfectly mastered.

In the gold print, then, we find a fresh proof in favour of the conclusion that the orthodox silver print is less indebted to the toning process for its appearance than is commonly supposed.

I pass now to a brief review of the advantages which would accrue to the photographer under an altered condition of things, assuming it were found practicable to simplify and improve our existing silver-printing processes. The first, and perhaps the most important, of these is the saving in cost which might be effected. Supposing it were found possible to produce a good silver print of the average type by means of a formula which should not involve recourse to gold toning, the saving effected from this source in the expenditure of the printer would be by no means inconsiderable. It is not necessary for me here to enter into any elaborate calculations. The cost of his chloride of gold, and the ratio which this cost bears to his whole outlay in the production of the print, are items which the practical photographer may very easily estimate for himself.

Hardly less important, from an economical aspect, would be the saving in time which would result as a necessary consequence of the disuse of the toning bath. In the ordinary course of things, working under the usual conditions, the amount of time spent in toning operations is large and indeed excessive. Under the circumstances, this can hardly be remedied. In the treatment of a batch of silver prints in the toning bath, it is found impossible, after a certain stage is reached, to maintain the rapid working of the gold solution without an addition of an extra quantity of the chloride. As this, however, means an increase in cost, the photographer in general deems it wiser to let things take their natural course, the result of which is that the process of toning, regarded as a whole, is apt to be unduly prolonged. Besides the time that is lost in the treatment of the prints, there is, in addition, that which is required for the preparation of the necessary baths as well as that which is expended in the recovery of the gold from the disused solutions. These items must all be taken into account in making up an estimate.

To the advantages, saving in cost and saving in time, a third may be added, namely, saving in labour. Under the system now practised, a good silver print is the result of a series of operations which, with one exception, make no great demand on the intelligence and executive ability of the printer. I say, with one exception, for the process of toning, necessitating as it does in a marked degree the exertion of the operator's skill, care, and patience, must be regarded as a case apart. Toning, in fact, is an art in itself, and as such cannot be carried out in a superficial and mechanical fashion.

The silver-printer's task, therefore, is in some measure an exacting and laborious one, though, no doubt, it will be contended that he is amply repaid for all his pains by the quality of the work he produces. The contention may be admitted, but does not serve to settle the question raised as to whether the trouble expended is, from the nature of things, a necessity.

Lastly, there is another advantage which would, I think, result from the simplification of our existing printing processes, and which, though perhaps not attainable in every case, must not be overlooked.

I refer to what in all likelihood would be the result of newer and simpler conditions of working upon technique, namely, a raising of the average standard of excellence in the matter of the appearance of the print. In saying this, however, I do not mean to convey the idea that we should be able to produce a better class of work than that turned out by the professional photographer now under the old system. All that is meant is that we should probably have more good prints by having fewer bad ones. In other words, the difference, frequently apparent to a painful extent, that distinguishes the work of the professional from that of the amateur, would tend to become less as the practical difficulties of the process were more easily overcome.

That this would be the natural result of the change there can be little doubt. With the disuse of the toning process, and with it of the accompanying necessity for observing that extreme care in manipulation which the average amateur seldom succeeds in acquiring, it is evident

that the risks of failure in working the process must be diminished, and the chances of producing good prints proportionally increased. To be sure, the amateur here would reap the benefit, rather than the professional photographer; but, in the other advantages which have been enumerated, each would be entitled to participate alike.

The facts mentioned in the foregoing short summary should suffice to convince the practical printer that the existing processes, while excellent in their way, are not without their shortcomings, and also that it is desirable that an endeavour should be made to introduce improvements in our methods of working, whereby the imperfections complained of would be either entirely remedied or reduced to a minimum.

In a second paper I propose to treat, in brief detail, of the remedies which would seem to be required to effect this end. I shall also give, as the result of careful experiment, a few jottings which may be of a little assistance to those who hereafter may turn their attention to an interesting and comparatively neglected branch of photographic research.

MATTHEW WILSON.

ANNUAL DINNER OF THE PHOTOGRAPHIC PLATE AND PAPER-MAKERS' ASSOCIATION.

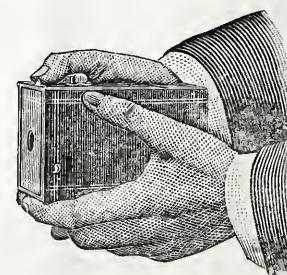
THE Third Annual Dinner of the Photographic Plate and Paper-makers' Association was held on Wednesday evening, May 2, at the Restaurant Frascati, Oxford-street, W. The chair was occupied by Mr. Frank Bishop, the Vice-Chairman being Mr. John Howson. Amongst the company were Mr. George Houghton, Mr. Edgar Houghton, Mr. F. W. Hindley, Mr. George Davison, Mr. F. K. Hurman (Newcastle-on-Tyne), Mr. Hubert Elliott (Elliott & Son), Mr. M. S. Berger (Berger & Co.), Mr. J. B. B. Wellington and Mr. H. H. Ward, Mr. J. Stevenson and Mr. C. Winter (the Imperial Dry Plate Company), Mr. H. M. Dennes (Morgan & Kidd), Mr. E. Schumann, Messrs. Whitfield (the Paget Prize Plate Manufacturing Company), &c. A very pleasant programme of songs, violin solos, and recitations had been provided, and the entertainment, combined with the admirable dinner provided by the renowned Restaurant Frascati, appeared to afford the highest enjoyment to all present.

The toast-list was short, and brevity characterised the speeches. The Chairman having submitted "The Visitors," Mr. Houghton and Mr. Bedding replied. In proposing the toast of the Association, Mr. Hindley said that he strongly supported its aims. The toast was replied to by Mr. Howson. The health of the Chairman was the last toast on the list. The speeches were chiefly congratulatory of the Association and the continued success of its aims in the regulation of discounts; and Mr. Howson took occasion to point out that, while at the first dinner there were no guests, the Press was represented at the second, and the Press and the trade at the third. An enjoyable evening terminated with the singing of "Auld Lang Syne."

Our Editorial Table.

THE BROWNIE HAND CAMERA.

Manufactured and sold by Kodak Ltd., 43, Clerkenwell-road, E.C. We doubt if the famous Kodak Company "can go one better" than the Brownie Camera for combined cheapness and utility. Measuring only $4\frac{1}{8} \times 3\frac{1}{8} \times 3\frac{1}{8}$ inches, it weighs $8\frac{1}{2}$ ounces. The lens has a focal length of 4 inches, and the size of the image given is $2\frac{1}{4} \times 2\frac{1}{4}$ inches. It takes daylight changing cartridges, transparent film or paper film being had as desired at 7d. and 5d. per spool of six exposures respectively. The instrument is neatly covered with leather cloth, the external fittings



are of nickel, and in loading and exposing the film the well-known Bullet and Bull's-eye Kodak movements are availed of. And all this for 5s.! The Brownie is simply a marvel at the price. The Company say that they think this new departure will have the effect of making thousands of new users of photographic apparatus of all kinds, as has been the case with their other and previous simplifications of photography and perfecting of film products. The Brownie is called a camera for boys and girls. We know several young people, as well as numerous "grown-ups," who were immediately smitten with the ambition to possess the specimen instrument the Kodak Company kindly sent us. Altogether, the Company may be congratulated on one of the surprises of the spring season; success, of course, will follow.

MESSRS. MARION & Co., of Soho-square, London, have placed on the market a series of post cards sensitised by the ferro-prussiate process. For use with these cards there is also a specially arranged collection of floral masks and discs in great variety. These are sold at sixpence the packet, and will be found of service for general work as well as for printing on post cards. Three special lists also reach us from Messrs. Marion: one devoted to specialities in projection lanterns and accessories; a second to the Radial camera; and a third (temporary list) to process apparatus and miscellaneous photographic materials.

CATALOGUE RECEIVED.

MR. JONATHAN FALLOWFIELD, of 146, Charing Cross-road, W.C., sends us his season's list, 1900. In the course of twenty-four large, closely printed pages it gives the reader a priced and illustrated review of the newest introductions to the photographic market in the way of apparatus and material. We can recommend our professional and amateur readers to procure a copy of this list: it contains something to suit all tastes.

A Handy Guide to Photographic Requisites is the title given to the list of photographic apparatus, materials, and chemicals issued by Messrs. Reynolds & Branson, Limited, of 14, Commercial-street, Leeds. It extends to over eighty-eight pages, and is a very well-compiled production.

Studio Gossip.

FIRE.—The studio and stores of Messrs. Johnston & Co., photographers, of 60, High-street, Stoke Newington, were destroyed by fire on Thursday night, May 3.

"PICTURES OF THE YEAR 1900," with nearly 250 reproductions of the leading pictures in The Royal Academy, New Gallery, &c., was published at the *Art Journal* Office, on the opening day of the Royal Academy, Monday, May 7. It contains, as usual, only pictures which are accepted and hung. The price in paper covers is 1s., and, as affording a second-hand glimpse at a selection of the year's art, is well worth possessing.

In his studies of slow motions, Professor Charles S. Slichter, by means of kinetoscope pictures, has so magnified the motions that the growth of seedling peas and beans during three weeks is shown in a few seconds. The plants were photographed on the kinetoscope film by artificial light at intervals of a few minutes to a few hours during the three weeks. On projecting the pictures upon the screen at the usual rate, the motion of growth was magnified about 500,000 times, and the different rates of development of the various parts were brought out very clearly. Among the striking results was the curious behaviour of a pea struggling to enter impenetrable soil, the root curving and writhing much like an angle worm, while the pea was rolled about very grotesquely.

LARGE CAMERAS.—Messrs. Penrose & Co., in *Process Work* for April, say that they have never experienced before such a run on big cameras as during the past three months, and it has taxed all the energies of their factory to turn out the number required in addition to the smaller sizes, which are in constant demand. Five 20 x 16 and four 24 x 20 cameras have been sent out since the beginning of the year, and three more of each size are in course of construction for orders in hand. Very few people realise the enormous amount of work in these large cameras. It is a very different matter from the way the small hand and stand cameras are being turned out nowadays. The tendency of process work seems to be towards bigger sizes, and it is natural this should be so with the greater ease with which the half-tone process is now being worked. Besides, big sizes pay if you can get the orders and can execute them properly.

THE "Woman's Exhibition" at Earl's Court, which was opened to the public last Saturday, is decidedly worth a visit. Its features include a Fine Art Section, which occupies nearly the entire space of the large building by the lake, known as the Queen's Palace, and contains a collection of close upon a thousand pictures all painted by women of various countries. In the Queen's Palace are also to be seen many examples of the achievements of woman in the Applied Arts, examples of every imaginable decorative piece of handiwork being contributed. In the Handicraft Hall, which is situated near the Royal Galleries, many interesting and beautiful "crafts" are seen in operation. The intention of the Woman's Exhibition, on its historical side, is to illustrate, by actual memorials, the most famous and distinguished of womankind, to exhibit their portraits by contemporary artists—the actual dresses they wore, their personal ornaments and feminine belongings, letters written by their hand—and similarly intimate details. The typical classes of womankind embrace all sections of society, preference being given to portraits of royal personages as best recognised; ladies of the historical aristocracy; women who have made famous reputations by their social charms, or have been traditionally celebrated for personal beauty; women whose names have become universally familiar, owing to their gifts as great singers, actresses, painters, writers, and in the various avenues to fame wherein womankind has left enduring marks.

News and Notes.

THE members of the Alpine Club are now holding an Exhibition of Alpine photographs in their Club Rooms, 23, Saville-row. The Exhibition will remain open until the 26th of the month.

THE Exhibition of photographs, mainly architectural, by Mr. F. H. Evans, is now on view at the Royal Photographic Society's rooms at 66, Russell-square, W.C., and can be viewed, on presentation of visiting card, from ten to four.

ON Tuesday last the Prince of Wales presented, at Marlborough House, the Albert Medal annually granted by the Council of the Society of Arts, to Sir William Crookes, F.R.S., "for his extensive and laborious researches in chemistry and physics, researches which have in many instances developed into useful practical applications in the arts and manufactures."

THE GREAT TELESCOPE AT PARIS.—The *Malin* states that an examination of the sun made at the Exhibition last week through the gigantic telescope at the Optical Pavilion gave unlooked-for results. The sun's image, as seen, was one of surprising clearness, and flame prominences, such as have hitherto been visible only on the sun's edge, were perceptible on the surface itself.

WE are informed that the Fourth Triennial Exhibition of the Ashton-under-Lyne Photographic Society will be held from November 12 to 17 inclusive in the Town Hall. It will be an invitation Exhibition, offering no prizes, and having no competition, but lectures, &c., will be given each evening. The carriage of pictures will be paid by the Society each way, and the exhibits will be insured whilst in their possession.

THE FORTHCOMING ECLIPSE.—The Astronomer Royal and his assistants have left for Ovar, in Portugal, in order that they may have plenty of time to make the necessary preparations for the observations they have in view. They have taken with them apparatus weighing in all about two tons for the purpose of photographing the eclipse during various phases. These photographs will be on a larger scale than those which were taken by the Astronomer Royal a couple of years ago in India.

MR. F. W. HASELGROVE sends *Nature* a photograph of a robin's nest in a water can, with the bird sitting upon its eggs, now to be seen at Finchley Cemetery. Our contemporary remarks that robins are well known to build their nests frequently in curious places, one of the most remarkable instances on record being that of a nest in a battered beer can between the rails over which trucks were continually passing at Worthing railway station. Flower-pots and water cans appear to be favourite nesting places of the birds.

AT the fortnightly meeting of The City of London Tradesmen's Club, on May 3, the feature of the evening was an extremely interesting lantern lecture by Mr. G. J. Clark, entitled "From Cairo to Khartoum." For many years Mr. Clark has been collecting views of Egypt and Palestine, and he explained that a number of the slides were prepared from views brought to England by a tradesman of the City of London. The lecturer took his audience from Alexandria, along the Mamoudia Canal, to Cairo, and thence up the Nile to the Isle of Philæ by the First Cataract, concluding with the exhibition of several slides illustrating the campaign leading to Lord Kitchener's victory at Omdurman. Mr. Clark dwelt upon the historical, religious, and social aspect of Egypt, as illustrated by the existing monuments and customs, and greatly interested his audience.

HOW WE SEE.—The essential nature of the action exerted by ether waves is still undetermined, says the *Chemical News* in the course of a review of Professor Shelford Bidwell's *Curiosities of Light and Sight*, though the old belief that the sensation was produced by a series of mechanical beats similar to the action of air waves on the ear no longer carries any weight. Ether waves can bring about chemical changes as in photography; they can also produce electrical effects, as, for example, when they are allowed to fall on a piece of prepared selenium; but it is inconceivable, and, further, there is no evidence, that they are able to impart their own vibrations of such enormous frequency to any part of the human organism. Many guesses at the truth have been made, but it is most likely that the effect is both electrical and chemical. Again, the range of sensibility of different eyes may vary in the same manner as do different ears, and it is by no means probable that all animals, and especially insects, have the same limits of vision as man; further, the same vibrations falling in different places will give very different results. A chemical action will be caused by the ray falling on the leaf of a plant, an electrical action if it falls on a selenium cell, and the sensation of light if it falls on an eye.

PROPOSED NEW ART CLUB FOR LEEDS.—A number of gentlemen interested in the furtherance of pictorial photography and art in Leeds and the West Riding of Yorkshire met on Friday evening last, at the Vegetarian Restaurant, Boar-lane, Leeds, to receive and discuss a scheme prepared by a sub-committee, with a view to the formation of an Arts Club for the City of Leeds. There were present Messrs. W. E. Tindall, R.B.A.; J. H. Gash, R. Bourke, Percy Sheard; T. Carter; W. M. Coultaff, and others. The scheme is only yet in a chrysalis stage of existence, but, from the well-known activity of the gentlemen interested, it may be fairly anticipated that such a Club will be formed. As foreshadowed in the report read at the meeting, the name of the proposed Club will probably be "The Arts and Crafts Guild," and the idea is to limit the membership to thirty, with a subscription of one guinea per annum. A further proposition is to hold an annual exhibition, probably in December of each year, of pictorial work, paintings, and it is also intended to include in the scheme representative workers in wood and metal. The question as to whether ladies should be admitted was allowed to stand over. There being only a small attendance at the meeting, the whole matter was left in the hands of a sub-committee, to convene a further meeting, and a proposition to invite likely exhibitors now showing in the Leeds Art Gallery was unanimously carried.

WHERE KNOWLEDGE ENDS.—"I suppose it is true that nobody exactly knows what happens when you drop a piece of sugar into your teacup," writes Dr. Andrew Wilson in the *Scotsman*, "or how the particles and molecules of sugar are taken to pieces by the molecules of the water, or what is the ultimate relationship of sugar and water when all is done. A stone is thrown into a pool, and we watch the ever-widening circles which gradually disappear and leave the pool surface as placid as before. Where do the vibrations end, or do they ever end at all? I suppose science would say they are endless, and pass-

out into the Ewigkeit, and mingle with the other vibrations which constitute part of the 'force' of the universe. After all, how little do we know of the real essence of anything. It is a profitable thought this, even if it tends somewhat to discouragement. But it has one great advantage, that, if it teaches the scientist humility of the best type, it should also impart a like lesson to the people who are not scientific, and who are never weary of airing their stupidity in denouncing scientific aspirations. Only it will never teach such people any such lesson. Nothing is known to them save the sense of their own importance, which is very extensive. That which really comforts the man of science is that his methods of research grow year by year in completeness and accuracy, and he does succeed in explaining many things whereof his fathers were ignorant. The spirit of true science is that it sees as in a glass darkly, and it waits, patiently and hopefully, for the days to come when will dawn the fuller light and the more perfect understanding.

THE monthly lantern-slide competitions, instituted by the Borough Polytechnic Photographic Society amongst its members at the commencement of the late winter session, have just been concluded. Mr. E. J. Hoar takes first place and the silver medal, scoring 114 points out of a possible 180, whilst Mr. F. W. Gregg secures the bronze medal with 99 points, and Mr. E. G. Hawgood the certificate with 88 points. Messrs. F. W. Bannister and R. R. Rawkins officiated as Judges throughout the season, and have rendered valuable service by their candid criticism of every slide submitted. These competitions have met with considerable success, and have, doubtless, been the means of infusing much interest in pictorial lantern slide-making throughout this Society. One result has been the formation of a set of "picked" slides, numbering about sixty, which the Society will be glad to lend to other societies, with descriptive notes, as soon as ready.

Commercial Intelligence.

THE FOLDING APEK CAMERAS.—Mr. W. Emery, of Soho-street, sends us a new list of his folding Apek cameras, and informs us that at the new and reduced prices they will be maintained at their former grade of excellence. The reductions in price are as follows: Folding Apek cameras, one camera, twenty per cent.; magazine Apek cameras, three or more cameras, twenty-five per cent.

HUSSON'S Safety Acetylene Syndicate, of 28, Victoria-street, Westminster, S.W., are issuing a catalogue of acetylene generators, purifiers and fittings, for lighting towns, villages, railways, factories, hotels, private houses, &c.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
14.....	Bradford Photo. Society	Varia. P. E. Newstead.
14.....	Stafford Photo. Society.....	Prize Slides. Reader, Mr. Rostance.
15.....	Ashton-under-Lyne.....	Demonstration: <i>Velox Printing.</i> D. A. Nightingale.
15.....	Gospel Oak	Prize Slides.
15.....	Hackney	Demonstration: <i>Glass in its Photographic Aspects.</i> Thomas Bolas, F.C.S., F.I.C.
15.....	Redhill and District	<i>Intensification and the Improvement of Negatives, with Experiments.</i> The President.
16.....	Croydon Camera Club	Demonstration: <i>A New Method of Counteracting Excessive Contrast in the Negative.</i> Benjamin E. Edwards.
16.....	Woodford	Demonstration: <i>Platona.</i> F. G. Emmer.
17.....	Liverpool Amateur	American Slides.
17.....	London and Provincial	<i>Rapid and Wholesale Development.</i> Messrs. Welford and Human.
18.....	Croydon Microscopical	Photographic Chat.
19.....	Bootle	Excursion: Raby Mere. Leader, H. G. Page.
19.....	Brentford	Excursion: Burnham Beeches with Stoke Poges. Leader, Mr. Squires.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 8.—Ordinary Meeting,—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

COLOUR AND GRADATION.

MR. CHAPMAN JONES, F.I.C., F.C.S., read a paper on "The Effect of Wave-length on Gradation." It had, he said, generally been taken for granted that the character of the gradation given by a photographic plate is not affected by the character of the light that produces the developable effect, except, perhaps, that red light has a greater tendency to produce reversal than blue light. It appeared that the trichromatic printing processes of to-day depend for the accuracy of their results upon the similarity of the gradation produced by the red, green, and blue-violet lights employed in getting the three negatives. Although there might be theoretical grounds for saying that the gradation is independent of wave-length, it was desirable to practically test the question, and the paper consisted of a detailed account of experiments conducted with this object. A strong light being necessary for these experiments, magnesium

ribbon was employed, the exposures being regulated by noting the weight of magnesium burned, or the length of ribbon when the weight per unit length was uniform. To isolate the colours, carefully tested coloured screens were placed close in front of the burning magnesium, the plate exposed being at a distance of three feet, with a rotating sector immediately before it for giving the proportionate exposures, while the space between the plate of the screen was enclosed by a brown-paper tube, in which were diaphragms to prevent reflected light from the surface of the tube from impinging upon the plate. The first experiment described was a comparison of the effect of blue light with that of green light, the green giving a steeper curve than the blue. The general tendency of white light was undoubtedly to give a steeper curve than ultra-violet, and, when green was compared with ultra-white, there was again a markedly greater steepness shown by the green, the less refrangible light. There was a greater steepness also in going from red to green, and an apparent tendency to reversal in the higher densities was here clearly set forth, there being also a marked tendency to less steepness in the lower densities. The ordinary plates, which showed no difference between green and ultra-violet, showed a steeper curve when red was compared with green, so that, if a plate did not show a steeper gradation in passing from ultra-violet to green, it did if one went on the red, and, if the red and green were alike, they were both steeper than the ultra-violet. The fact was thus emphasised that, as one got longer wave-lengths, or went farther towards the red end of the spectrum, steeper curves were produced. A second series of experiments was carried out with specially sensitised isochromatic plates developed with metol, with the exception of three which were developed with pyro and ammonia, the ammonia being found to decrease the steepness of the gradation given by the red as compared with that of the blue, or to increase the blue as compared with the red. Summarising his results, Mr. Chapman Jones said they showed that gradation is not constant with varying wave-length or varying colour; that, the longer the wave-length, the more one approached green or red, the steeper would be the gradation, except that it became less steep in the higher densities, the tendency to reversal being possibly greater, and also probably less steep in the lower densities. The differences in gradation were not due to different compounds in the film when specially sensitised, because the same differences were shown by ordinary plates, an increase in the difference of wave-length giving a difference in the increase of gradation. The experiments also demonstrated the fact that the use of pyro and ammonia leads to irregularity in this respect, as in others, making the curve produced by the light of longer wave-length less steep than it otherwise would be, or that of shorter wave-length more steep than it should be. It seemed probable that it was the ammonia that caused this irregularity.

COMING EVENTS.

May 22, Technical Meeting, subject to be announced. June 12, Ordinary Meeting, a paper by Mr. H. L. Aldis, B.A. June 26, Technical Meeting, a paper by Mr. J. H. Agar Baugh.

On May 29, Dr. P. H. Emerson will open an exhibition of his works in the Society's rooms, and will deliver an address. The present Exhibition of photographs by Mr. F. H. Evans will remain open until May 26.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 3.—Mr. A. Mackie in the chair.

Mr. J. E. HODD brought forward the "Volvo" apparatus for developing, fixing, washing, and drying rollable films. It consists of a wheel, a stand for same, and two specially shaped dishes. The quantity of film one is enabled to develop depends, of course, upon the diameter of the wheel, as the film is wound upon the rim. The width of film depends upon the width of the rim also, but wider wheels can be had to fix to the same spindle. The rotation of the wheel carries the film through the developing solution until the images are complete, when a similar action performed in another trough fixes and finally washes the film, which may be dried whilst still on the wheel.

Mr. W. F. CRAWFORD showed his Express rotary developing machine, constructed to take either quarter or lantern plates, twenty-four in number, and accommodating equally well glass plates, celluloid or paper films, and bromide prints. It serves also for toning and finishing silver prints, and forms an excellent washing apparatus. Mr. Crawford claimed that two dozen average exposures could be developed in twenty-two minutes and washed in ten minutes, resulting in a great saving of time over methods involving the handling of only one or two plates at a time.

Mr. PHILIP EVERITT thought the apparatus would serve very well for stand development with dilute developer. The usual methods available for stand development had the great objection and drawback that a bright line was caused round any deep shadows, due to a creeping action, arising perhaps from the stagnant condition of the solution. If, by means of a small motor or other arrangement, the machine could be kept slowly rotating, the application to the purpose he had outlined would be quite feasible.

The statement that forty-eight ounces of solution was required in any event, for the working of the apparatus, was discussed from the point of view of the expense in the case of developers not commonly usable more than once.

Mr. CRAWFORD said he had used pyro ammonia for three batches of plates, and that a little citric acid would remove any stain that might be caused.

Mr. R. BECKETT thought that, if sufficient sulphite were used, this would not mark the limit of use, and that five or six times would probably be safe.

Mr. J. E. HODD passed round a stoppered bottle having on its outside a ground surface to serve in place of the ordinary paper label, a celluloid holder for small plates to prevent contamination of the fingers with chemicals, and two of Wynne's locket exposure meters. Mr. Hodd also passed round a bundle of prints on an American self-toning paper, all of which were frightfully marred by blotches and spots of an unaccountable nature. He toned before the meeting a print on some of the same paper, with the same result. The paper, it appeared, was packed face to face with nothing intervening, but between the backs of the papers were pieces of

paper which it was considered might have caused the trouble. No explanation was offered, the defects being somewhat strange and unusual.

Mr. T. E. FRESHWATER passed round silver prints from negatives taken through Joly screens, and an enlarged photograph of a piece of gold quartz.

Mr. R. H. PRIMAVESI brought forward a photograph taken with a single lens, with an exposure of thirty minutes, at nine p.m. on a May evening, the subject being a marine pier by electric light. From each arc lamp lines of electric influence proceeded to the foreground of the picture, every line having similar curves. The brightness of the lines decreased with the distance of the lamps from which they proceeded. Wherever the lines changed their direction, a bright spot appeared. He wished to know at what time in the exposure did the occurrence take place. It was instantaneous in his opinion. Since taking this photograph, he had tried repeatedly with three cameras to get a similar result, but unsuccessfully.

Mr. A. HADDON said that the thing was due entirely to a mechanical origin, and not electrical as suggested, caused by an oscillation of the camera.

Mr. BECKETT suggested that a pinhole in the shutter blind would easily explain the appearance. After closing the shutter the camera might have been moved before the dark slide was closed, and the path travelled by the camera was registered by the pinhole images of the lights upon the plate.

The subject will be again brought up at a later date.

PHOTOGRAPHIC CLUB.

MAY 2.—Mr. Frank Haes in the chair.

Mr. F. A. BRIDGE brought to the notice of the meeting a case of platinum poisoning of which he had been informed. A girl who was set to tone lantern slides with platinum was found to be so sensitive to its effects that something in the nature of paralysis of the arm had set in. To show how small a quantity was sufficient to give rise to these symptoms, it was mentioned that a jar which had contained platinum toning solution was rinsed out with water and given to the girl to finish washing, but even the minute trace which was still present caused her the same paralysis.

Mr. A. MACKIE mentioned the case of a chemist who had been experimenting with platinum, and said that his hands were in a terrible state as a result.

It did not transpire what salt of platinum was used in the case mentioned by Mr. Bridge.

Upon the recommendation of the Committee it was agreed that during the summer months the meetings should take place at 7.30 p.m. instead of 8 as at present.

Mr. W. F. CRAWFORD said that, returning two years ago from New Zealand, and travelling about England, he had amassed some 600 exposures in a comparatively short time. Wishing to develop them expeditiously, he worked out as a developing machine an apparatus made and used in New Zealand by him as a washing machine. This apparatus he now showed. It was constructed for quarter-plates, and could be used for developing glass plates, celluloid films, paper negatives, and bromide prints, fixing and washing, and for toning and finishing silver prints. The apparatus consists of a stout glass trough provided with bearings, upon which are supported, by means of a spindle, two glass discs provided on their inner surfaces with radial grooves. Glass plates may be inserted directly in the grooves; films and prints are supported there in carriers of celluloid or other material. There is provision for twenty-four exposures at a time. The developer having been placed in the trough, the discs charged with the twenty-four exposures are lowered with rotary movement into the solution, and kept revolving by means of handles attached to the spindle. In reply to a question, Mr. Crawford said that it worked at its best with exposures of a similar nature. Violent under or over-exposures would manifest themselves as the development proceeded, and it was an easy matter to remove any that required special treatment. After development was complete the discs were removed and placed in another tank to wash, and the fixing bath poured into the first trough. Finally a stream of water is allowed to play, water-wheel fashion, on the film sides of the plates, for about ten minutes, which was found sufficient to free them from hypo. Mr. Crawford showed negatives so developed at the R.P.S., also prints toned therein.

Croydon Camera Club.—Wednesday, May 2.—The PRESIDENT gave a short address upon the forthcoming Exhibition of the Royal Photographic Society at the New Gallery, Regent-street. Mr. MACLEAN reminded his hearers that the Exhibition in question promised to be a great step forward as regards the attention it will attract and the facilities it will possess for the effective and orderly display of a much larger number of photographs than was possible at the Pall Mall Gallery. In connexion with the new regulations and conditions which had just been issued, he trusted he would be pardoned for reminding them that the Royal Photographic Society were now carrying out the advice given by the speaker in his paper read at the Photographic Congress in 1893, which, under the title, "Photography in Compartments," strenuously advocated that "the bewildering mixture" of all sorts and kinds of photographic productions should be shown at the Society's Exhibition in well-defined groups. This has at last been carried out, so that in the forthcoming Exhibition classes have been formed for (1) pictorial photography, (2) general professional work, (3) apparatus, (4) photo-mechanical, (5) scientific photography. Leaving this portion of his subject, the President spoke of the desirability of members who proposed exhibiting making immediate arrangements to produce their pictures, which, on account of the large dimensions of the New Galleries, should preferably be either direct enlargements or from enlarged negatives. He strongly advised intending exhibitors to prepare what they thought suitable and bring their prints to the Club, so that they might be fully criticised, and suggestions made for amendment or improvement before the prints were finally sent up to the institution for judgment. He also gave a short account of the National Photographic Exhibition now open, advising members not to lose the opportunity of seeing a comprehensive collection of up-to-date apparatus, &c. In connexion with this advice, a party of members arranged to visit the above on Saturday afternoon next. A description of a new blind shutter, which works

in front of the lens, drew forth the opinion of Mr. Maclean that the brevity of exposure was not directly proportional to the width of the slit in the shutter. This was debated, and subsequently, by means of the optical lantern, Mr. ISAAC demonstrated that, unlike a "focal plane" shutter, such a one as that under consideration permitted light to reach the whole of the plate, while the opening was passing in front of any part of the lens. Subsequently a number of lantern slides by Mr. Willcocks were inspected, the President taking the opportunity of announcing that a bronze medal offered by the Thornton Heath Photographic Society for lantern slides had been awarded to their member, Mr. G. W. Watson, the second position being gained by another member of the Club, viz., Mr. A. Willcocks.

North Middlesex Photographic Society.—May 7.—At the lantern slide competition held at Jubilee Hall, Messrs. Crane and Rawkins tied for first place out of a good collection of slides. The second general competition, and the prints from the Rochester outing on Easter Monday were a very good collection. Mr. Beadle was first and Mr. Mummery second in the general competition, and in the Rochester outing Mr. Mummery was first and Mr. Broad second. Twenty-one prints were sent into the latter. Mr. Crane showed some Wellington stripping films which he had just tried, one of which was stripped at the meeting. They were good negatives, and free from defects.

Leeds Camera Club.—The concluding meeting of the winter session was held at the Club Rooms, Grand Restaurant, Boar-lane, Leeds, on Wednesday evening last, when the awards in the Club's recent competitions were made. Mr. H. Stockwell, who was awarded the silver medals in two classes, being Hon. Secretary of the Club, had generously decided to waive his claim, and the first prizes were therefore withdrawn. A bronze medal for lantern slides went to Mr. H. Laverack, and a similar award for prints to Mr. Bell. Mr. SKILBECK afterwards entertained the members by a description of how to construct a reliable exposure meter for tenpence, and at the same time explained the working principles of Wynne's actinometer. A resolution was agreed to, seeking affiliation with the Yorkshire Photographic Union, and Messrs. Rust, Skilbeck, and Stockwell were appointed delegates for the first fortnightly meeting of the summer session. Mr. C. GREYSON also exhibited a handsome pedestal stereoscope containing a large number of views. During the summer season the meetings will be held the first and third Wednesday in each month only.

FORTHCOMING EXHIBITIONS.

1900.

- May 23-25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.
July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between April 23 and April 28, 1900:—

- FULL-SIZE FINDERS.—No. 7470. "Improvements relating to Full-size View-finders for Twin-lens Cameras." C. B. WINTER.
CAMERAS.—No. 7474. "Improvements in Photographic Cameras." Complete specification. J. GAUT and J. J. ROUSE.
ANIMATED PHOTOGRAPHS.—No. 7560. "Improvements in the Production and Reproduction of Animated Photographs." A. SINCLAIR.
PAPERS AND FILMS FOR X-RAY WORK.—No. 7653. "Improvements in Photographic Papers, Films, and Plates for use in Röntgen or X-ray Photography." J. W. T. CADETT.
CAMERAS.—No. 7664. "Improvements in Dark Slides for Cameras." W. F. STANLEY.
STEREOSCOPIC PHOTOGRAPHS.—No. 7684. "Improvements in Means for Exhibiting Animated Series of Stereoscopic or other Views." R. BÜNZLI.
CAMERAS.—No. 7722. "Improvements in Photographic Cameras." Complete specification. O. THIEMANN.
CAMERAS.—No. 7867. "Improvements in and connected with Magazine Cameras." M. E. BANGER.
SHUTTERS.—No. 7920. "Improvements in Apparatus for Controlling the Exposure of Photographic Sensitised Films." Complete specification. A. HOFMANN.
FILMS.—No. 7921. "Improvements in or relating to the Marking of Photographic Films." Complete specification. A. HOFMANN.

Correspondence.

** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

** We do not undertake responsibility for the opinions expressed by our correspondents.

THE PHOTOGRAPHIC CLUB.

To the Editors.

GENTLEMEN.—I beg to inform you that, in consequence of continued ill health, our Secretary (Mr. W. R. Stretton) has reluctantly been compelled to resign the position, which resignation has been accepted by the Club with regret.

I have undertaken to carry on the work as Secretary and Treasurer *pro tem.*

It has been decided that, in order to meet the wishes of the majority of the members, during the summer months the meetings will commence at 7.30 p.m. sharp.—I am, yours, &c.,

E. A. NEWELL.

4, Maiden-lane, Queen-street, London, E.C., May 4, 1900.

A HAND-CAMERA CHANGING MECHANISM.

To the Editors.

GENTLEMEN.—I am advised to patent a changing mechanism I have constructed for a hand camera for my own use.

Before doing so, I should be glad of your opinion of its commercial value.

I first made it for twelve plates, but found I could eliminate certain objectionable features by making it for eight plates, which I consider enough for the class as distinguished from the fifty-film or roll class. The size is $5\frac{1}{2} \times 5\frac{1}{2} \times 10$ for a five-inch lens, but the weight is less than the ordinary camera.

1. A plate is changed by a half turn of a nut.

2. No sheaths, only light rims.

3. Nothing can touch the sensitive surface, for one rim cannot touch the next.

4. Nothing loose to rattle, and no falling plates.

5. Changing, being independent of gravity, can be effected in any position of camera, and the latter may be even sent spinning in the air without displacing anything.

6. Additional weight of mechanism for stereoscopic as compared with quarter-plates practically *nihil*.

7. Rapidity. The whole eight plates can be changed in four seconds (not four seconds each).

8. No levers, pulls, racks, wheels, or springs.

9. Changing mechanism of such a nature that it can be made of celluloid or vulcanite.

10. Without bringing into action additional mechanism, a plate already in the focal plane can be moved aside to substitute another, and afterwards brought back; thus the plates may be of different brands, speeds, or colour-sensitiveness, and any one can be exposed at will and in any order, for the indicator is for the purpose of showing *not* how many plates have been exposed, but *which* plate is in the focal plane.

With your unique knowledge you may be able to kindly tell me (1), Is there such a camera already on the market? (2), Would there be a commercial demand for such?—Thanking you in anticipation, I am, yours, &c.,

R. B. HUGHES.
Green Bank, Bangor, May 7, 1900.

[We know of no plate-changing mechanism exactly similar to that described by Mr. Hughes. With regard to ascertaining its commercial value our correspondent's best plan will be to submit it to some manufacturer of hand cameras.—Eds.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:

T. M. Barbour, 1, Brierley-street, Bury, Lancs.—Photograph of the Bury football team and English cup.

A. G. B.; J. McCONNAN; R. HOLDEN; WATER.—The answers to these and other correspondents are unavoidably held over.

MONOCHROME.—Robert Johnson's work on *Retouching*, published by Messrs. Marion & Co., Soho-square, W., contains many helpful chapters on the subject.

CASTLE.—Yes; we believe, if you take legal proceedings, you can recover in such a case. But, before deciding to sue, you had better take a solicitor's advice.

KHAKI.—We presume that the gentleman you invited to sit did not pay you anything. In that case the copyright is yours, and you can proceed against the infringers.

B. L. E. asks us to tell him the best developer for bromide paper.—In reply: We might make many suggestions, but we do not think we could do better than advise him to use the developer recommended by the makers of the particular paper.

DIRECTORY OF PHOTOGRAPHERS.—E. B. writes: "Is there a directory of photographers published?" If so, where can it be obtained, and what is the cost?"—In reply: Messrs. Percy Lund & Co., Bradford, publish such a directory, price, we believe, 7s. 6d.

ELECTROTYPEING.—W. WISDEN. Your query in no way applies to photography, and our space is too limited to admit of giving practical details for making electrotypes from bronze medallions. Better get a manual on the process of electrotyping.

TOWER.—1. We believe Messrs. Marion & Co., of Soho-square, supply such goods. 2. Messrs. Poulton's address is (or was) Lee, S.E., but we understand that the business was taken over some time ago by Messrs. Hazell, Watson, & Viney, 1, Creed-lane, E.C. Better write that firm.

J. MCLEISH.—The Aerograph may be described as a kind of pencil carrying finely divided pigment in solution, which is directed by air pressure to the surfaces of bromides, carbons, platinotypes, &c. If you write to the Aerograph Company, 30, Memorial Hall, Farringdon-street, E.C., they will send you full particulars.

YEARLY AGREEMENT.—C. W. The verbal agreement, even if a witness was present, is not binding on either side, and you are liable to be dismissed at a week's notice. You also can, if you wish, leave at any time by giving a week's notice. An agreement on either side, to be binding, must be in writing, and duly stamped.

A. J. JACOBS.—The process is fully described in a book on heliographic printing by Mr. G. E. Brown, published by Dawbarn & Ward, Farringdon-avenue, E.C. Again, at pp. 994–1008 of our ALMANAC for 1900, a complete series of formulæ are given. Consult one or both, and you will have all available information.

RESTORING DAGUERREOTYPES.—X. Y. Z. says: "I have an old Daguerreotype (on glass) which is very much faded. Can I restore this in any way?"—As the picture is on glass, it is not a Daguerreotype. It is a glass positive by the collodion process, and there is no method of restoring these pictures when they have faded. If it were a Daguerreotype, the case would be different.

MARKING ON A NEGATIVE.—W. THOMPSON writes: "Would you kindly let me know what is the cause of mark down the enclosed 12×10 negative? The dark slide is a new 12×10. I put two plates in this slide, and they are both marked in the same way. It was the first time I had taken this slide out. After exposure they were left in the slide (securely wrapped up) for a week before developing."—In reply: The markings appear to us to be such as would be caused by the leather hinges of the dark slide's draw shutter. The exhalations from the leather, probably caused by heat, were of a nature to partly obliterate the image.

SPOTS ON PRINTS.—ALEC CHAMBERS says: "If you will tell me the reason of the black spots on prints enclosed, through your valuable columns, I should be greatly obliged. It is such a waste of time to have to get fresh prints off, owing to these spots."—The spots are caused by particles of foreign matter coming in contact with the prints while they are wet, and so reducing the silver at that point. Probably this occurs in the operation of washing the prints before they are toned. It may, however, occur after that. Particles of pyro, or other reducing agents, would cause the spots; so would particles of iron in the washing water.

PATENT INFRINGEMENT.—H. PRADEAN writes: "I should be obliged if you could let me know the best course for one to take in the following matter. In 1896 I was granted a patent for a hand camera (No. 23,840), and during a visit to the photographic exhibition I saw the hand camera, and find that the movement is an exact copy of my patent. The exact date of patent is October 27, 1896, and I granted in the same month manufacturing rights to Messrs. ——."—In reply: We recommend you to place yourself in the hands of a respectable solicitor, who will advise as to whether you have a clear case. Much will turn on the claims made in both cases.

FAULTY ALBUMINISED PAPER.—E. A. SWEETMAN says: "I herewith enclose some prints made on enamel albumenised paper, and should esteem it a favour if you would give me, in the columns of your JOURNAL, your opinion as to the cause of the mealiness shown in the prints. The paper was sensitised for three minutes on a fifty-five grain bath, and the peculiar part of the matter is, that out of, say a dozen sheets floated on the same bath, ten will be perfectly free from the defect and the other two faulty. Sometimes all will go well for weeks together, then this mealiness crops up again, and, although I have tried using a weaker bath and floating for a shorter time, the result is practically the same."—The mealiness in the samples sent is due to the silver bath being too weak. It may have been of the right strength when the sensitising was commenced, but each sheet of paper floated makes it weaker on the surface by robbing it of its silver. This it will do, though the strength remains nearly the same towards the bottom of the dish. After three or four sheets have been floated the solution should be stirred up, or otherwise agitated, to maintain an equal strength throughout the bulk.

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EX CATHEDRÀ.

THE Secretary of the British Optical Association, writing from Clifton Chambers, West-street, Blackpool, sends us the current number of the official publication of the transactions of the Association, *The Dioptric and Ophthalmometric Review*, which is sent out monthly. "Some few years ago," writes Mr. Sutcliffe, "and to a certain extent even at the present time, the public and the trade generally suffered so very much from the many unscrupulous and incompetent quack opticians travelling the country, that it was felt that any scheme having for its main idea the classification and qualification of the optician would be readily welcomed. With this intention the British Optical Association was founded about four years ago, with the idea of improving, educating, examining, and certifying our sight-testing opticians. That this scheme has proved an unqualified success will be apparent when I tell you that not only has it been found necessary to make admission by examination a *sine-quid-non*, but that, up to the present date, out of eighty candidates nearly two-thirds were unsuccessful, thus showing the necessity for examination. The members of the Council,"

adds Mr. Sutcliffe, "are working hard to place the Association on a basis somewhat akin to that of the Dental and Medical Association, and are confidently looking forward to the time when by charter, legal enactment, &c., the eyes of a so far long-suffering public will be attended to and cared for by competent and duly qualified refractionists." We have much pleasure in giving publicity to this statement of the Association's objects. The *Review* is brightly and ably written, and the information it imparts to refractionists appears to be carefully selected. It is a large question whether sight-testing should or should not fall within the scope of ophthalmic surgery; but, putting that matter aside, the B.O.A. is deserving of encouragement in its efforts to exact from those who make the care of people's eyes an affair of business some evidence of possessing the necessary knowledge of what is required.

* * *

READERS of the copious war intelligence printed in the newspapers have, no doubt, seen occasional references to a unique specimen of journalism produced at Bloemfontein, viz., *The Friend*, "edited by the war correspondents with Lord Roberts's Force." A copy of this publication, dated April 11, has been kindly sent us for our inspection. It is a large sheet of four pages, three of which consist of advertisements, the remaining page being made up of news and telegrams relating to the war. There is a contributed article headed "The War Artist of To-day," by Mr. H. Owen Scott, war photographer for the *Illustrated London News*. Mr. Scott most ably states the case for the new school of war artists, photographers, and says that, as long as the men practising this art are honest and do not attempt to foist faked work on the public, their efforts are bound to be acceptable. The article contains matter which, in the opinion of the editorial directorate of *The Friend*, is of a controversial nature, for some replies to Mr. Scott from well-known artists at the front appear to be anticipated. We are much obliged to Mr. G. W. Scott, of Fulham, for letting us see this copy of *The Friend*. The present conflict in South Africa has given photography an opportunity of proving what a valuable aid it can be to war correspondents, and it was quite in the fitness of things that attention should be directed to the point by one of the new school of "specials" writing, practically on the field of hostilities for purely local readers.

SINCE writing the previous paragraph we have received another copy of the *Friend*, dated Easter Monday, April 16. About that time Lord Roberts was beginning to move his army northwards and the editorial article in the paper tells the reader that the war correspondents with the Field Marshal's force can no longer be responsible for the conduct of the journal. Our interest in this particular copy of a unique newspaper lies in the fact that Mr. Scott's letter above referred to appears to have evoked a reply from the well-known artist, Mr. W. B. Wollen, R.I., who, if we mistake not, represents the *Sphere* in South Africa. Mr. Wollen clearly holds a brief for art *versus* actuality, and, although his letter is not before us, it is not difficult to imagine his line of argument. He discounts the claims of the photographer to a place amongst war "artists," and is persuaded that the readers of the illustrated papers prefer hand-made sketches of war history to photographically produced records. Mr. Wollen's belief that the war artist, as opposed to the war photographer, will "come out on top" draws a very spirited reply from Mr. H. C. Shelley, the able war photographer and correspondent of our contemporary, the *King*, whose success is due in chief measure to the photographic enterprise and journalistic ability which Mr. Shelley has shown while he has been following the British forces in South Africa. The old Glasgow camera enthusiast puts the case for the war photographer as against the war artist with great skill and forcibility, and makes it abundantly clear to his readers six or seven thousand miles away what is clear to the newspaper-reading public in Great Britain to-day, and what has so often been insisted on in these pages, viz., that the war correspondent of the future will be the photographer-journalist. The descriptive writer, however able, will stand small chance of employment unless he be a skilful photographer, for his services are sure to be in demand in both capacities. As for "the man with the pencil," the "artist" *per se*, we are convinced that he is a doomed personality on the battlefield, however valuable his services may be in Fleet-street or St. John's Wood. We reprint Mr. Shelley's able and cogent letter in another part of the JOURNAL.

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THE following paragraph appeared in some of the daily newspapers at the beginning of the present week: "The Lord-Lieutenant of Ireland is desirous of purchasing and presenting to the Queen a collection of photographs of incidents connected with Her Majesty's visit to Dublin, and will be much obliged if artists who have taken any such photographs would kindly submit them to him through the Ulster King of Arms, Dublin Castle, in order that the collection may be made as complete as possible. All copies which are not selected will be carefully treated and returned immediately to their owners." We reproduce Earl Cadogan's request for the benefit of several photographic friends whom we know to have been in Ireland during the recent Royal visit, and who possibly might not see his Excellency's request in the ordinary newspapers. It is a distinct compliment to photography, at a time when the illustrated journals so largely avail themselves of its aid to fill their pages, that the Viceroy of Ireland is anxious to secure a series of direct prints for the purpose of presenting the Queen with a pictorial memento of her visit to the Sister Isle. Evidently the innumerable half-tone reproductions from photographs that are published week by week have far from destroyed popular appreciation of direct photographs. Indeed, the poorly produced blocks that are so lavishly given in the

newspapers and periodicals appear to be creating a reaction in favour of photographic prints of popular subjects, which so few years ago it was confidently expected would no longer command public interest in face of the all-pervading phototypic illustration.

* * *

THAT a photographer has no right to use the negatives of sitters without their consent was again established one day last week. At the Westminster County Court the Tab Bas-Relief Photo Company were sued for damages by two actresses (sisters) for selling their portraits without permission. According to the reports in the Press, the ladies had the portraits taken in the ordinary way of business. Later, when touring in the country, they found them on sale everywhere. The portraits appeared on Christmas cards and on handkerchief and glove boxes, &c. For the defendants it was said that the ladies paid reduced prices, it being usual for professional ladies to do this; also that there was nothing on the photographs to indicate the names of the ladies. In the end the Judge found for the ladies with ten guineas costs each and granted injunctions restraining further sales. It has been established over and over again that the negative is the property of the photographer. It has also been established that he has no right to use it for any purpose of his own without the consent of the sitter. That point was first decided in a law court, if we remember rightly, in the case of *Polla versus The Photographic Company*, many years ago. We call special attention to this case, because we know that some photographers imagine that, as the negatives are their property, they have the right to do as they like with them. They have not, however, even to the extent of exhibiting them in their show-cases, without permission of the sitters.

PHOTOGRAPHING AT THE PARIS EXHIBITION.

OUR readers are, no doubt, aware that the hand camera is to be admitted free to the Paris Exhibition, and, as some doubt may arise in the mind of many as to what is to be understood by hand camera, we may quote from an editorial article in a contemporary, the *Photo-Gazette*, which sets at rest any speculations on the interpretation of the official declaration. Monsieur Mareschal says: "It would have been more explicit if the term 'camera held in the hand' had been used, for a photographer will not, for example, consider that a camera taking plates 10 x 8 inches is likely to be regarded as a hand camera." We therefore approached the General Commission of the Exhibition for a further explanation, and learnt from Monsieur Chardon, the General Secretary, to whom we referred, that the restriction was to be interpreted absolutely literally. Any apparatus, whatever its size or shape, must pay the twenty-five francs fee if it is supported on a tripod or other device, whilst, on the other hand, any camera, of whatever size, is exempt from payment so long as it is carried in the hand. It may be a 10 x 8 instrument, or the small folding camera. It would be labour lost to discuss this regulation, for there is no possibility of its being altered. What remains to consider is how the best results may be obtained.

Those who wish to work with the stand camera can only do so in the morning. They must first apply to the Administration Department (Quai d'Orsay, near the Pont d'Alma) for the necessary permit, for which they will pay twenty-five

ances, and which authorises them to photograph to their heart's content until one hour after noon.

Those who use a camera without a stand are free to work from morning to night. These will do well to provide themselves with a hand camera provided with a rising front and a lens embracing a tolerably wide angle, for many of the monuments, &c., in the Exhibition are so placed that the photographer must take them, if at all, at comparatively short range. La Rue des Nations, which presents some of the most interesting features, runs almost exactly from east to west. It will therefore get the sun in the morning and evening; but, as it is almost straight and planted with large trees, it will be almost impossible to make instantaneous views in it. The photographer will find things better arranged for him in the palaces on the north side, the main façades of which point towards the Seine. The whole of them can thus be taken in the morning from the Pont des Invalides, a lens of long focus being advisedly employed. More detailed views will also be obtainable early in the morning. Le Palais de la Belgique, which is one of the most notable, and which represents the Hôtel-de-Ville d'Anvers, can be obtained by means of a good rise of front. Le Palais de la Hongrie is likewise of great interest, but only part of it can be obtained at a single exposure, as other buildings intercept the view. Those who dislike rising early in the morning can obtain a good view of these palaces from the Pont de l'Alma close on sunset, but they should not attempt le Palais Belgique, the main façade of which will then be illuminated from behind. All the right bank of the Seine, being due south, will be easy to photograph. The parts to be specially noted are Old Paris and the Palais de la Ville de Paris. On the Esplanades des Invalides, the principal artery of which runs almost exactly from north to south, it will be difficult to get a lighting other than one which gives one side sunshine and the other shadow. If the best time is to be taken advantage of—about noon—turn the back on the Dôme des Invalides, and arrange, if you can, to have a clouded sky, not sunshine. Behind the principal galleries of the Esplanade will be found many interesting features: to the east, les Musées Provençal, la Maison Bretonne, &c.; to the west the various foreign buildings will be found to present difficulties in photographing.

Le Pont Alexandre can be taken from various points along the left bank of the river. The front of the bridge, on the side of the Champs Elysées, can be taken at any time. The statues and decorative work make it a most interesting subject; to include these, the camera should be placed on one side of one of the footways. The two palaces on the Champs Elysées stand behind it. The larger is well lighted up to mid-day, the smaller all the afternoon.

The position of the Champ de Mars is south-east and north-west; good lighting can therefore be obtained at almost any time, but in sunshine the waterworks in the background do not come out well; for these diffused light should be chosen.

Le Trocadéro will be fully lighted most of the day, and by taking one's stand in the central roadway the different construction of the two sides can be obtained. Russia stands out prominently, and behind it, by the left wing of the Palace, is China, where, with a wide-angle lens, an excellent view is obtained.

These few notes from our contemporary will show there is much to be done even with a hand camera. One hint may be added: As plaster enters largely into all the buildings, backed plates will be found of special value in securing negatives free from halation.

Astronomical Light Filters.—The image given by a refracting telescope, like that from a photographic lens, especially of the older type, is accompanied by a secondary image. The latter rarely gives any trouble, but that in a telescope may be a source of difficulty, as the quality of definition is required to be so much greater. Thus a star which to the eye represents a point of light may show, when examined through a telescope of low power, as two separated stars, while a more powerful instrument will again split up these new stars, and so on, a refinement of definition never looked for in photographic instruments. Yet each of these stars is really defined, not as a point, but as a disc, surrounded by another fainter coloured disc, the secondary image. Messrs. T. J. J. Lee and G. H. Peters, of the U. S. Naval Observatory, have been making experiments to get rid of this violet secondary image by using screens or light filters arranged as a cap to fit outside the eyepiece of the telescope. They tried several screens, and found the definition to be improved, as anticipated. A parallel to this plan is found in microscopic work. These experiments refer more particularly to eye observation, but it is naturally to be expected that similar beneficial results would be obtained in a photographic direction, though the *modus operandi* would need changing. Here the ordinarily most photographically active portion of the spectrum was excluded. If a photograph were to be taken, it would, with most stars, be better to utilise this part and exclude the other, a suitable adjustment of the focus being made.

It is interesting to note the kind of screen adopted for such a one would suggest itself as being a suitable one for a dark-room light filter for ordinary photographic operations. The adiactinic material found best was a solution of picric acid and chloride of copper in alcohol, which, in the case in point, was placed in a small cell and fitted as mentioned above.

The Value of Photography in Astronomy as shown in American Work.—We need scarcely point out that of late years telescopic objectives have been constructed with curves specially adapted to utilise to advantage the more actinic part of the spectrum, thus showing that the chromatic aberration is not entirely got rid of. Of the immense value that photography has been to the astronomer there cannot be two opinions. Most worthily and splendidly has his work been seconded in America—the home of the finest observatories in the world—by the munificence of private individuals. The first star photograph was taken in America by Professor Bond in 1850, while Rutherford and Draper have given lustre to Transatlantic records by their early work—the former by his early photographs of the sun, moon, and stars, and the latter by his stellar spectra pictures, which were the first photographs of value in depicting lines which gave some idea of the actual composition of the stars. Coming to a later period, photography has been of inestimable value, under Professor Barnard's direction, in recording details of comets, nebulae, the Milky Way, &c., while Professor Pickering's Draper Memorial stellar spectroscopic photographs are a monument of skill and scientific adaptation of photographic means to an end. The work done at the Lick Observatory is mostly photographic, and, indeed, to put it in a few words, most of the important astronomical discoveries of late years in America, as elsewhere, owe their value to the negatives they have been able to produce since the development of the gelatino-bromide dry plate.

Aurora Spectro-photographs.—In a recent number of *Comptes Rendus* M. Paulsen gives a description of some successful work in photographing the spectra of the Aurora Borealis. The negatives were taken by him in Iceland, where, he reports, the displays last December and January were very vivid. He employed two spectrographs in his work, and was so successful as to obtain records of twenty-two lines, sixteen of which are photographed for the first time. One of his instruments had glass prisms, but in the other quartz was used so as to avoid the absorption of the ultra-violet rays, that part of the spectrum being very inefficiently dealt with when the dispersion is brought about by glass.

Experts and the Value of Paintings.—The opinions of experts, and their evidence in law-suits, is often largely discounted, and, in many instances, not without justification. Some months back we alluded to an application in the Appeal Court with reference to the sale of the Peel heirlooms, amongst which were a couple of fine paintings by Van Dyck. For these 11,250*l.* had been offered privately, and the Court was asked to sanction the sale, for it was said that, in the opinions of experts, they would not realise more than from six to seven thousand pounds at auction. The Court, however, and wisely, decided that these pictures must be sold at auction, and not privately. At the time we insinuated that the sum offered was much below the value of such fine works as were these two examples of Van Dyck's powers. On Friday last the pictures came "under the hammer," and realised the substantial sum of 24,250*l.*, about double the sum offered for them privately, and nearly four times what the experts had estimated them at if sold by auction. An offer had been received for them from Belgium of 20,000*l.* before the sale. It will be interesting to see what is the ultimate destination of these two pictures; we could have wished that it was one of our national collections. Amongst the pictures sold on Friday were some by W. Collins, Greuze, Van der Weyden, Landseer, Sir P. Lely, Hoppner, Mulready, Sir Thomas Lawrence, and other well-known artists, most of which fetched good prices. The day's sale realised 53,350*l.*, and included other works of art besides paintings.

Keeping the Roof of the Studio Waterproof.—In the Foreign News and Notes a fortnight ago we gave a method, recommended in the *Camera Obscura*, of keeping the roof of the studio impervious to water. It consists of employing, instead of putty, a compound consisting of paper pulp, pitch, resin, gutta percha, and wood tar, for cementing the glass to the sash bars. It is said to answer well. Leaky studio roofs have always been a *bête noire* to photographers, and many suggestions, from time to time, have been made for avoiding them, with more or less success. A professional friend of ours, when in business, made it a practice to periodically give the sash bars and the outside wood work a thin coating of gas tar, to which a little tallow had been added. He told us that, since he had adopted that plan, he had not been troubled by water finding its way through the roof. Possibly this method of avoiding leaky roofs may be of service to many of our readers.

End of the Lantern Season.—The lantern season may now be said to be over, and secretaries of photographic societies are by no means to be envied in the task before them of providing pabulum for the meetings during the summer months, supposing, of course, their societies meet during the summer season. The task is somewhat lightened, it is true, by some of those enterprising houses that have demonstrators who will attend at meetings to practically illustrate the working of the novelties of which they make a speciality. Not only do the meetings by this means have the opportunity of seeing the latest novelties put upon the market at their own doors, but often an instructive discussion follows which has nothing directly pertaining to the novelties exhibited, and thus a pleasant evening is spent. But for the lantern and these practical demonstrations, it is a little difficult to imagine how many of the hundreds of photographic societies there are in this country could possibly exist, let alone continue to flourish as they do.

Vesuvius.—After a period of inactivity this volcano has again awokened from its slumbers, and created some alarm amongst the dwellers in its neighbourhood, notwithstanding that the authorities at the Observatory on the mountain assured them there was no immediate danger. A Reuter's telegram last week stated that four English tourists, who went beyond the limit indicated as dangerous by the guides and gendarmes, had been seriously injured by masses of incandescent stone, and were lying in Naples in a serious condition. It is scarcely likely that nowadays there would be four tourists from England without one or more cameras, and we know

that enthusiastic]photographers will, at times, run risks that but for photography they would not do, and that naturally occurred to our mind. A few photographs of this volcano in violent eruption, when the wind was favourable, would make grand as well as interesting pictures, hence many when in the district would be tempted to incur some risk to obtain them. From later telegrams we are pleased to learn that the first report that four Englishmen had been seriously injured was inaccurate. These telegrams also state that the violence of the eruption is subsiding.

"THE BRITISH JOURNAL OF PHOTOGRAPHY" WAR FUND.

An excellent start has been given to the Fund which it has been suggested we should collect from our readers for inclusion in the larger Fund on behalf of the widows and orphans of soldiers killed in the war that is now being so ably organized and administered by our contemporary, the *Daily Telegraph*.

With characteristic kind-heartedness, Mr. Thomas R. Dallmeyer F.R.A.S., President of the Royal Photographic Society, at once came forward with sympathy and help. Mr. Dallmeyer wrote:—

"I have read your appeal to the photographic world in aid of the War Fund with much interest and sympathy, and have great pleasure in enclosing a cheque for 5*l.* 5*s.* in support of your excellent object. I venture to think that photography, pre-eminently, has enabled us to grasp the terrible earnestness of the war, and to realise, more clearly than the most vivid descriptions alone, its hardships and difficulties, and the valour displayed in overcoming them.

"All who have contributed to photographic knowledge, and all who have worked to further photography, either as an art or an industry, may feel some pride in the part their efforts have played in the present war. I sincerely wish your appeal every success, and hope that it may be widely read and unanimously supported, despite the fact that it is probably an 'extra turn' that is now being asked for."

The distinguished photographer, Mr. H. Walter Barnett, of 1, Park-side Hyde Park Corner, S.W., also wrote us:—

"Concerning the article in your JOURNAL of the 11th inst., appealing for subscriptions from the photographic world, I have no reason to doubt that manufacturers, photographers, dealers, &c., have individually done their part in giving funds for the benefit of the widows and orphans, poor sufferers by this war, which is for the good of humanity as a whole; but I am glad to see your suggestion that we should, as a class, do something more, and have much pleasure in enclosing my cheque for 10*l.* 10*s.*, and also a cheque for 3*l.*, the latter being the result of a collection among my employees."

The first list of subscriptions is as follows:—

Messrs. J. H. Dallmeyer, Limited, 25, Newman-street, Oxford-street, W.....	£10 10
Mr. H. Walter Barnett, 1, Park-side, Knightsbridge, S.W.	10 10
The Proprietors of THE BRITISH JOURNAL OF PHOTOGRAPHY ...	10 10
Mr. T. R. Dallmeyer, F.R.A.S., President of the Royal Photographic Society	5 5
Employees of Mr. H. Walter Barnett	3 0

Our thanks are here tendered to the above-named gentlemen for the ready help. We have forwarded a cheque for 39*l.* 15*s.* to the *Daily Telegraph*, in the columns of which journal an acknowledgment will doubtless appear simultaneously with this announcement.

We sincerely hope that the admirable precepts and examples which are supplied by the above-quoted letters and the accompanying contribution will have the greatest weight and influence with our readers, all of whom we cordially invite to send us a subscription, large or small—but the larger the better. It is probably true that various war funds have successfully appealed to the generous instincts of most of those who read this appeal; but the fact remains that there are strong reasons, as pointed out by Mr. Dallmeyer and Mr. Barnett, why the photographic industry and profession should, as a class, participate in the good work of helping those upon whom war has cast the burden of loss or suffering.

Cheques, postal orders, &c., that are sent to us should be crossed and made payable to "The Editor, BRITISH JOURNAL OF PHOTOGRAPHY."

MR. F. H. EVANS'S EXHIBITION AT THE ROYAL PHOTOGRAPHIC SOCIETY.

THE spirit of uniformity pervades the photographic atmosphere at 60 Russell-square, where Mr. F. H. Evans has his exhibits on view just now. That the prints are well worth a visit goes without saying; the

e mounts and frames are in keeping with the subjects is worthy of comment in these days of incongruous collections of variegated mouldings, and that the whole show is quiet, and careful, and of uniform quality speaks well for the exhibitor. There is no effort to achieve greatness, and yet the exhibits touch the point above mediocrity — mediocrity here so many of our exhibitors either stop short or stoop to eccentricity to keep up their reputations. There is nothing, however, in this Exhibition that borders on the eccentric, although one or two of the figures, perhaps, might be considered by some to transgress the usual limits of inventiveness.

There are no large pictures, the exhibits are uniform in size, which is small, the granulated canvas paper, two yards long by six inches high, conspicuous by its absence, and in its place are several sober-toned grey prints, technically as perfect in their particular province as photography can make them. The interior architectural work is even dainty in many instances, and cannot be too highly praised for its cleanly handling, its delicacy of detail, and its beautifully manipulated light and shade. The external landscape combined with architecture did not, however, impress us so much as the more careful studies in stone.

The Kelmscott series of pictures were interesting, and we will notice them *seriatim*, as they will, no doubt, command more than passing attention. The view from the Thames is the old familiar one, and is a landscape of little merit. The *Entrance from the Road* demands more careful scrutiny, the fine old elm tree being not the least picturesque part of the print.

The *Front Entrance* looks rather dangerous, and we imagine the fault lay with one of the camera legs, which might have been groggy in the knees. *From the Orchard* is a study in shadows: the rugged branches of the apple trees cast their shadows on the grass and break the foreground into reticulated patches of light and shade. *In the Garden* contains a cookery, and the rooks appear to have been having a game at seesaw whilst the photographer was timing his exposure, for the tree-tops are a mass of twiggy blurs. This picture is interesting from its associations merely, and the next, *The Garden Front*, is very flat. *In the Tapestry Room* is rather nice in light and shade, and the two armchairs are certainly sans reproche. The *Bedroom of Mr. Morris* contains an antique four-poster, which looks very shabby about its two front posts; in fact, we should require a heavy insurance premium paid before we ventured to sleep under its canopy. Who was it that described one of these old bedsteads as antiquated heaps of mustiness? *In the Attics* was fuzzy-wuzzy when viewed within a few feet, but the effect was very charming at a greater distance, and we must assume that the expressive words of a great artist long since dead and gone were in the mind of the operator when he perpetrated this picture. Those words were, perhaps, more expressive than polite, but one inferred that the picture "was not painted to be smelt at." *A Study in Contrasts* takes us above the attics into the ancient timbered roof, where light is streaming in upon the rafters, making a very strong chance in favour of halation, which, however, has been cleverly avoided by Mr. Evans.

The church comes last. This is a landscape with trees. We can well imagine the photographer on his way to divine service casting a longing eye on those fine old trees, forming a splendid background for the church. We can still further imagine during the lengthy sermon that his mind would revert to the scene outside, and it wants but a little greater stretch of the imagination to bear the parson say towards the close, "What went ye out for to see?" here the photographer fidgets in his seat and tries to look outside. "The trees (*sic*) shaken by the wind?" at which our friend starts visibly recalled to place and season. But the mischief is done, for, when he photographs the church, he takes the trees "shaken by the wind." At any rate, the trees in this picture have either moved or the camera legs caught cold and shivered.

But there is much to interest the lover of landscape in this Exhibition. Let us take, for example, the scenes in Redland Woods. As a rule, their names afford an index to their character. Look, for instance, at *An Avenue in Fairyland*; the title is perhaps a trifle far-fetched, but it is fairly descriptive of the original. *Evening under the Pines* and *Primeval Giants* are equally expressive; *A Study in Greys* says little, but in the original indicates much that is "tender" and delicate. *Easter Snow* is also a beautiful bit of work.

The forest scenes hardly need any description of the prints other than that conveyed by their titles. What could be better than these: *Evening in Epping, a Quiet Wood*; *An Honourable Old Age, New Forest*; *A Woodland Nave*; *Hot Sun and Welcome Shade*; *An English Glade*; *A Lane in Sunlight*. All these are perfect little pictures, quite in keeping with one's ideal of the scenes they represent.

Several of these woodland pictures excel in the beauty of their treatment, their tones are exquisite, and more like the delicately pointed bits one sees in the illustrations to some of Ruskin's works. Lakeland is more sombre, but cloud-storm and sunshine have each received their mead of attention with good results. The seascapes are not so interesting. *Loneliness* is not a prepossessing title to start with, and the picture does not belie its name. *Evening Clouds* is slightly better, but wanting in life. *Where the Sky dipt down to Sea and Sand* (Tennyson)—Well—There no man could live, or move, or have his being.

Finally, *Sea and Sky and Sand*, and here the description:—

A still salt pool locked in with bars of sand,
Left on the shore, that hear all night
The plunging seas draw backward from the land
Their moon-led waters white.—TENNYSON.

The reader expects much from reading the title, but gets about a $3\frac{1}{2} \times 2\frac{3}{4}$ with two little notes of exclamation between the sea and sky, a bit of distance and a lot of seashore.

Now, as to the portraits, there are several good examples of untouched work—some of them look rather coarse and fuzzy, and have not the same careful handling that characterises the majority of the work displayed. Mr. Storey's face will be familiar to most visitors, and Mr. Aubrey Beardsley's portraits will cause comment for several reasons.

Mr. Todhunter looks a studious gentleman, and might have invented the puzzle published by his great namesake, viz., that of the *pons asinorum*.

The female face and figure hath no charms for the talented exhibitor, or, if so, he fails to display them to the greatest advantage.

CRITICUS.

THE WAR ARTIST OF TO-DAY.

[Reprinted from the Bloemfontein Friend.]

CAN you inform me whether there has been a sudden exodus from Bloemfontein of war correspondents armed with cameras? There ought to have been, and yet I have inquired in vain whether such an event has taken place. For, look you, the judgment has gone forth from the pen of Mr. Wollen that the "war artist," meaning the man with a pencil as opposed to the man with a camera, "will come out on top." Truly, this is most disheartening. No one likes to be thrust to a bottom position, and, if that is to be the fate of the man with a camera, why should he any longer endure the hardships of campaigning and the sorrows of separation from the comforts and companionships of home?

But the war correspondent with a camera has not gone home, he has no intention of doing so. He is unrepentant enough to believe that he, and not the man with a pencil, is going to "come out on top."

Let us have the point at issue clearly defined. War correspondents are with the army to report the war—some by word pictures, others by camera or pencil pictures. Sightseeing is a passion with humanity. Every inhabitant of the British Isles would like to have a personal vision of the conflict in South Africa, but, save for two or three irresponsible persons whose presence at the front no one can understand, those inhabitants are compelled to rely upon the eyes of others. Now, leaving aside the correspondents who devote themselves to word pictures solely—the question to be decided is, Does the man with the camera surpass the man with the pencil in depicting the actuality of warfare?

An astounding claim is made on behalf of the man with the pencil. He can, we are told by Mr. Wollen, show the public "an accurate bird's-eye view of what a battle is like." And he does it by "a few lines to indicate the background and characteristics of it." The same authority assures us that "the brain of the camera cannot take in all that is going on. The man with the pencil does so." Such is the case for the man with the pencil. Now for the test of cross-examination.

Modder River and Magersfontein may be cited as two representative battles of the war, and so may be honestly used as touchstones to try the claim Mr. Wollen makes on behalf of the man with a pencil. In each case there was a battle line of some five or six miles; in each case the enemy was invisible; in each case it was physically impossible for any one man to see more than a small portion of the battle. A spectator on the right flank at Modder River could have no personal knowledge of incidents which were happening in the centre of the bridge, or down the river on the left flank. Even of his own particular section on the right flank that spectator could not attain to a perfect knowledge; but the man with a pencil is untrammelled by such minor matters as time and space, he takes in "all that is going on." Or, if he does not take it all

in, he puts it in his sketch. The result is no more "an accurate bird's-eye view of what a battle is like" than a photograph of Oom Paul is like a photograph of Mr. Chamberlain. In short, the facility with which the pencil man can jot down what he did not see is his ruin.

It will be obvious that the man with the pencil, not being ubiquitous, cannot "take in" all that happens on a battlefield; he sees just as much as, and no more than, the man with the camera; for the rest, which forms so large a proportion of his sketch, he has to rely upon the testimony of others. Now, when the public have in their hands a result attained by this method, what is its value as an "accurate bird's-eye view of what a battle is like?" Absolutely *nil*. People at home want to see a battle as they would have seen it if they had been present, and no sane man will contest the assertion that the best medium for giving them that vision is the camera rather than the pencil. Try as he may after the actual, the man with the pencil thrusts his personality between the event he sees and the people at home for whom he wishes to reproduce it, and consequently his sketch becomes a miserable failure when considered as an "accurate bird's-eye view of what a battle is like."

On the other hand, what does the man with a camera do? He and his lens see at least so much of a given battle as any man with a pencil, and what they see they see with unfailing accuracy. Take that battery in action which Mr. Wollen chooses to cite as a subject wherein the powerlessness of the camera is supposed to be illustrated. The camera man does not fear the test. He can show the guns coming into action, record their unlimbering, depict the preparation for firing, and time a photograph at the actual moment of firing. It is true that his picture will not show quite such a volume of smoke as the sketch of the man with the pencil. But why? *Because the smoke is not there*. The man with the pencil puts it in because other men with pencils have been putting it in for generations. Perhaps, too, the public would not mistake the sketch for a battle scene if the smoke were absent. Any how, what becomes of the boast of *accuracy*? Moreover, the man with a camera will not present his public with a twelve-pounder firing from the carriage of a howitzer.

There is something more to be said for the man with a camera. Nowadays he is in the habit of screwing a tele-photo lens to the front of the camera, and with that lens he can immensely out-distance the vision of even that all-seeing man with the pencil. Objects a couple of miles off are brought near, and groups of men can be photographed at such distances as prevent them assuming any posing attitudes. In this way actuality takes on the added charm of natural grouping, and I shall be greatly surprised if some of the tele-photo pictures of this war do not take rank as the most artistic as well as realistic records of its incidents.

After all, the man with a camera may safely leave his case in the hands of others. Take a negative and a positive witness on the question in the abstract. Mr. Julian Ralph writes that "the pictures of our battles which are coming back to us in the London weeklies are not at all like the real things," and then he adds: "I saw the other day a picture in one of the leading papers by one of the best illustrators. It showed the British storming a Boer position. In the middle ground was a Boer battery, and the only gunner left alive was standing up with a bandage round his head, while smoke and flame and flying fragments of shells filled the air in his vicinity. In the rush of the instant he must have been bandaged by the same shot that struck him, and, as for smoke and débris in the air, there was more of this in the corner of that picture than I have seen in all the four battles we have fought."

Now for the positive witness. He is no less a person than the art critic of the *Pall Mall Gazette*, who can no more be charged with a predilection for photography than Messrs. Steyn and Kruger can be saddled with a predilection for truthfulness. This critic dwells, as Mr. Scott did in the letter which opened this discussion, upon the old and new methods of war illustration, and then candidly adds, "I would like to say that the artists score off the photographer, *but they do not*. The public wants the facts as near as may be, and are too deeply stirred to be put off with melodrama."

One other witness may be called to give Mr. Wollen an idea of how the work of the man with the pencil is faring at home. Here is a recent private letter from England, which makes merry in the following fashion over those sketches which are so inclusive and accurate: "There is a picture of two gunners standing to attention after having exhausted their ammunition. The man nearest the gun is looking straight in front of him, with a bandage round his head, a bullet wound in his face (close to the left ear), two in the right side of his chest, and one in his right leg, some distance above the knee. Within a yard of him is a bursting shell. But that man ignores such trivial things. Still he stands. I suppose

the weight of so much lead in him keeps him up. One wonders whether he is hollow inside, so that the bullets all drop down into his feet."

No wonder, worthy editorial sirs, you have not witnessed an exodus of men with cameras from Bloemfontein; they are staying to "come out on top."

H. C. SHELLEY.

PICTORIAL COMPOSITION IN PHOTOGRAPHY.

[Paper read before the Edinburgh Photographic Society, and awarded the Society's Bronze Medal.]

In view of the magnitude of this subject, and the frequency with which it has been treated in photographic literature, in a rudimentary as well as in an elaborate, manner, it might seem impossible in the compass of a short essay to set forth anything of value, or that would not merely be an echo of what has been repeated a hundred times. I am well aware it is almost impossible to say anything absolutely new on the subject of pictorial composition, but I hope by elaborating to some extent certain well-known rules, and by examining and analysing some distinctive examples of different styles of composition, as found in the works of acknowledged masters, to arrive at a somewhat clear perception of the various qualities that go to the making of a well-composed picture. It must, of course, be understood that this subject, although resting on simple foundations, rises into great complexity and subtlety, and in the highest reaches of art its laws become almost intangible, and elude analysis. It is, however, impossible in photography to carry extreme subtlety into composition; we must rest content to have the stronger elements of the picture correct. The painter may, indeed must, carry purpose into every touch of his brush, but the photographer knows that his efforts in the direction of composition cannot descend to minute detail. Notwithstanding this limitation, the task of the photographer is no easy one. Granted that he has got a subject that is everything that can be desired, the choice of point of view, of manner of lighting, of atmospheric conditions, and of the distinctively technical methods by which he arrives at his result—all these things demand the exercise of his best skill, and it is only in the most favourable circumstances that he can congratulate himself on his success.

For a long period photographers seem to have been content with qualities demanding little more than manipulative skill. As we know, some of the early workers were men of cultured taste and had high ideals; but, as the art became easy of acquirement, and cheapness of production brought popularity, almost all efforts after excellence were in a short time submerged by the tide of philistinism. For some years past it has, however, been the aim of thousands to produce work distinguished by artistic feeling, and, if the impossible has been sometimes vainly attempted, it must be admitted that astonishingly fine results have frequently been produced by means of the camera when the nature of the subject admitted of artistic treatment.

In speaking of architecture, Ruskin says that the good designer must begin like the owl, and finish like the eagle. The necessity of attending in the first instance only to broad masses when designing a building appears to apply equally when the object is to design a good picture. To illustrate how little the quantities of broad and pleasing composition were in the past sought for and obtained, there is now thrown on the screen a representation of a show-case of landscape photographs, such as we have been accustomed to see suspended on shop fronts, contrasted with a number of pictures in which graceful composition is very apparent. I am aware that this is rather a contrast of extremes, not only on account of the practical impossibility of composing photographs that would be as thoroughly harmonised as the best paintings, but also because commercial and artistic considerations do not always coincide. Yet there can be no doubt that the public, which delights in topographic detail, does not object to a little art thrown, as it were, into the bargain; and there is now a large number who can appreciate and will buy good pictures for their art quality exclusively. It must be a matter of common observation that of late there has been a considerable improvement in purely commercial photography, although much more is still to be desired. Perhaps it is not too much to say that the best work of that kind which we see here at present is produced in our own city, and by one of our own friends.

On examining the sketches that appear on the screen, it will be seen that, in order to be pleasing, a picture regarded as a whole must have—

1. Unity of motive.
2. Breadth of effect, or harmonious disposition of the masses of light and shade.
3. Balance, and harmony of line.

There are other desirable qualities which must characterise pictures, e.g., variety in the lighting, lines, surfaces, &c., and suggestiveness

mystery, purity of colour, &c., but it is not my intention to deal with these at present.

1. *Unity of Motive*.—No picture is altogether satisfactory that fails in the quality of unity. It is an oft-repeated truth that the simplest pictures are the most powerful, but it is naturally impracticable to lay down rules for the attainment of this quality. The photographer should know, in every case, what attracts him to a subject, and he ought resolutely to reject whatever counter-attraction may exist in the field of view. It is no uncommon thing to find two distinct pictures, or, it may be, a picture and a half in one photograph. It requires no small amount of courage to reject what we are tempted to convince ourselves may possibly turn out to be beautiful accessories to the main theme. The possession of lenses of different focal lengths, by enabling the photographer to fill his plate with exactly the subject he desires, should take away the chief temptation to retain extraneous matter. The well-known expedient of adjusting slips of paper on the margins of a print for the purpose of determining experimentally the best size and shape as a guide to trimming should never be neglected. Whilst giving this caution, I think it well to say that it appears to me this principle of restriction, like many others, is sometimes carried too far, and, as a consequence, the subject is presented with objectionable baldness. This is naturally a point on which no rule can be absolutely laid down—the true guide can only be feeling the result of culture gained by observation, and study of the best models.

2. *Breadth of Effect, or the Harmonious Disposition of the Masses of Light and Shade*.—The amount of space occupied respectively by light and shadow varies greatly even in the best pictures. It was laid down as a general principle by Sir Joshua Reynolds that a fourth of the picture should be light, another fourth dark, and the remaining half of middle tint. But, as has been said, these proportions are widely departed from, notably in the work of those pre-eminent artists, Rembrandt and Turner, the pictures of the former consisting largely of shadows, those of the latter chiefly of light. There must, however, be something of the nature of balance in the opposing parts of a picture. The slide now to be placed on the screen will, to some extent, illustrate the manner in which lights or shades may be said to balance each other, a small strong mass being the equipoise of a large weaker mass.

The figures represent (1) a dark disc balanced by a larger faint one; (2) ornaments balanced against each other; (3) the same principle applied in the case of an irregular mass, which is also broken up into parts; (4) the principle applied to clouds; (5) a foreground tree, balanced by a mass of wood in the distance; (6) cottages balanced by a tree; (7) sketch of Bass Rock, with boat near the shore.

[These principles were further illustrated in diagrammatic form by a slide showing Turner's *Fighting Temeraire*, McCulloch's *Inverlochy Castle*, and Orchardson's *Napoleon on Board the Bellerophon*.]

A slide by Mr. George Cleland was also shown to illustrate how the difficulty of getting a fine, well-diffused light over sky, water, and earth can be overcome.

The next slide shows pictures by Orchardson, which are remarkable for the simplicity and beauty of the disposition of the light. It will be noticed that the principal figures are in a very light colour, and it is instructive to observe the manner in which the light is carried with so much delicacy and beauty through the picture.

In the pictures we have just been examining we are struck with the beautiful modulations of the light and shade, and the harmonious way in which the lines melt into each other. It is in landscape we most frequently miss this sense of symmetry, and, paradoxically, it is in landscape we find it sometimes unduly developed, as, for example, in Turner's later work, which strongly suggests formal and conventional treatment, with a consequent air of unreality. As illustrating this characteristic of the somewhat formal treatment of landscape, the next slide, representing work by B. W. Leader, has been chosen. The work of this artist is undeniably captivating in composition, and it is impossible for the photographer to be led too far astray in the imitation of his methods, because nature will not allow it. It will, however, be felt that the *waywardness* of nature, which is one of her charms (certain modern schools of art perversely esteem it her chief charm), has been unduly eliminated. If nature is rich in harmonies, she certainly does not allow them to fail of full effect for want of "accidentals."

The next slide illustrates work by the late Sir J. E. Millais. It seems to me that the landscape work of Millais may be accepted as illustration of sound practice in composition. Those who have observed the reproductions of his work can hardly fail to have been struck by its resemblance to a well-composed photograph. He chose the most characteristic example he could find of a particular kind of scenery, and repre-

sented it as forcibly as he could, not making his work easy by elimination of all the material which a weaker man would have deemed foreign or unharmonious, or by scamping the detail of foliage, reeds, grass, &c. There was nothing partial or affected about his impression of a landscape, and the consequence is that scenes such as *Murthly Moss, Chill October*, *The Vale of Rest*, and *The Old Garden*, along with his many famous pictures in other branches of art, take their place in the memory as the work of no other modern master has done. If, as we were recently told on high artistic authority, a photograph is to be defined as "an imperfect impression of nature gone wrong in the fixing," it is to be feared that this striking resemblance of the landscape work of Millais to photography and to unsophisticated nature must, in the estimation of many artists, place it under a similar double derogation. It is, however, possible that the high-toned landscapists of to-day may allow some more or less faint traces of merit in the rude landscapes of Millais, although they smack so strongly of nature, and not at all of Hokusai or even of Corot. Doubtless the work of the impress on schools is, much of it, extremely beautiful, valuable, and unique, and it would be only absurd to speak in depreciation of the masterpieces in that style, yet one cannot but say that, on the whole, an exhibition of the work popularly called impressionist is of so spiritual an essence that it leaves, with most people, little more permanent mental residuum than a visit to a carpet warehouse. As a rule, the ordinary impression picture is not, directly at least, very valuable to the photographer, while realistic pictures, such as those of Millais, may be studied with great advantage. Photographs can never be too bright nor good for human nature's daily food.

This slide gives pictures to illustrate breadth of effect as opposed to "spottiness." In the first two cases the effect is due largely to choice of subject; in the other the boats are grouped in an effective manner to this end.

3. *Balance and Harmony of Line*.—The common rule is that lines running in one direction must be compensated by lines running in a contrasting direction, as in the example shown in this slide, where in each case *b* represents lines complementary to *a*, and it will be observed that a short, strongly defined line will balance a long one weakly defined, also that a short, strong curve will be a set-off against a long one of slight curvature. The other outlines are taken from pictures by eminent artists. The word line must not be used in too restricted a sense, as breadths of shadow, when they in connexion with pictures extend in a linear way over a picture, must be treated as if real lines.

The next four slides are shown to illustrate the fact that it is usually more easy to secure the balance of the lines of a picture when the subject is close than when dealing with landscape on the large scale.

Hill Stream, Aberfeldy.

A Bit on the Burn at Giford.

Ferns at Loch Vennacher.

Wayside Flowers at Aberfeldy.

Glen Croe. In narrow and winding glens we find the same facility of composition that obtains in foreground subjects.

Doubtless, photography has many fields of more importance than those dealing with foreground, but in none are its peculiar excellences more evident. Where the principal charm is wealth of beautiful detail, we are constrained to admire rather than to criticise, for the camera puts all our unaided faculties of imitation to shame.

All portraits that are at the same time works of art possess harmonious lines in a marked degree. A slide is now shown containing several portraits by artists of eminence to illustrate this fact.

The next slide, which has reproductions of G. Paul Chalmers' *Legend* and Terrier's photograph, *The Ghost Story* (well known to most of us as the Society's presentation print of 1893-94), has been chosen to illustrate the necessity of avoiding too great formality and any appearance of the picture being made by rule. *The Ghost Story* is a fine composition as regards light and shade, but the rule of the pyramid is too obvious, and, if we contrast the random-looking but yet graceful grouping of the figures in the *Legend* with the somewhat mechanical grouping in *The Ghost Story*, we will have no difficulty in learning a needful lesson. There should not be too much plane geometry in a picture. Another point to be noted is the somewhat huddled grouping that characterises almost all photographs as compared with the free arrangement of the figures in paintings. Of course, the technical difficulty of free grouping is well known to all photographers.

We hear the maxim constantly repeated that "the art is to conceal art." This principle of concealing the means by which an effect is produced is of great importance, but, like many another principle, it is not at all times desirable to carry it to an extreme length. We often find poetry of the highest rank in prose composition, notably, for example, in

the works of Ruskin, yet we love not poetry the less but rather the more when the words run in numbers with the added charm of rhyme. So, when we find in a picture the sweet harmonies of line, and the pleasant balancings of light and shade—those analogues of rhyme and numbers—we need not be ashamed to confess our delight in their visible presence, if, as in the case of the good poem, *they are skilfully and not superficially employed*, and so become the evidence of an added genius. I have thought it necessary to repeat this idea, because, as already indicated, some of the modern schools of art seem by their practice to hold a firm conviction that only the picture that is the parallel of the prose poem is the expression of true enlightened art. It seems to me the well-composed photograph avoids two opposite extremes; it is the staff of art life, equally removed from the caviare of the decadent and ultra-impression schools on the one hand, and from the confectionery of the purely decorative men on the other. There are Worths and Redfers in the world of art, and their words seem to have the weight of eternal verities—till the fashion changes. Their little systems have their day, they have their day and cease to be, but a robust common-sense art will survive when that which is merely pretentious and vapid, or at best esoteric, will have vanished into obscurity.

Photographers are not quite free from the weakness of following some prevailing fashion, but they do not, or cannot, go to the same extremes as the artists. The pendulum of photography vibrates in measured arcs; that of painting is seen to strike out in wild erratic excursions. Let us set our own watches by our own clock—let us follow our own sober counsel as photographers.

Perhaps I may be allowed a word or two on the subject of vignetting. The making of vigneted pictures was submitted some years ago by a dogmatic writer on photographic art to unmitigated condemnation, and his dictum was taken as so sound and incontrovertible that many photographers, doubting apparently the grounds of their own taste, fell in with his ideas, and ceased to make or admire vigneted pictures. The almost universal delight in a vignette rests on much too solid a foundation to be blown away by one puff from a conceited mouth. It is a fact, that in the ordinary exercise of vision we are constantly looking on vigneted pictures, and it is only by looking from a port hole that we can do anything else. Even good paintings which are not *apparently* vignettes are so in the effect obtained, for, though they seem to fill the square frame up to its corners, the feeling of intelligibility (which is at times not too oppressive, even in the centre) fails entirely as the margins are approached. It would, of course, be as foolish to recommend the universal adoption of the vignette as it was entirely to veto it, but there can be no doubt that many photographs otherwise unrepresentable on account of distracting or unbalanced marginal matter may be rendered perfectly delightful by resorting to a method of treatment to which no natural or honest exception can be taken.

Before closing, I feel constrained to say that, even when the rules of composition have been mastered, there is a branch of the photographic art where the difficulty of producing a satisfactory picture is extreme. I refer to idealised figure subjects. It is the terrible, uncompromising truth-telling of the photograph that is the chief cause of this, perhaps the only unsurmountable cause. We may bury our pictures in utmost depths of Rembrandtic shadow, but we cannot entirely succeed in our highly idealised subjects. A little cynical demon lurks in the bellows of our cameras. His delight is to thwart all our efforts after the ideal, and never yet has he failed. After an infinitude of painstaking posing, and draping, and backgrounding, and lighting, and waiting for the right expression on the sitter's face, we expose a plate, we expose two plates, to avoid all risk of failure we expose three plates on our grand ideal subject, *The Soul's Awakening*. We get three perfect—technically perfect—negatives, but, alas! alas! the demon has been at work, and our every trick has been made transparent. Then how foolish it seems of Miss Brassey—for it is, and can be no other than Miss Brassey—to be dressed so absurdly, and to gaze at the ceiling in such a meaningless and silly way. Seriously, there is no help for it. This kind of subject must be avoided. Before deciding on any figure subject, let one ask himself the question, Is this make-believe? If it is, let him be sure that in the result it will be seen to be so, and, in that case, where can be the pleasure of looking at the picture? Like the little boy in the story, the camera demon is always threatening to tell you, and, like the boy, he will be as good as his word.

In all the ordinary pursuits of life, in work or in play, the camera may be successfully employed, and, if we avoid all strained attempts at artificial posing, for the most part only, watching for and seizing the fine natural attitudes and groupings that occur spontaneously, we need not sigh because it is denied to us to deal with the distant in time or the ideal in art.

The most precious gift of our life, that gift without which all the others are almost valueless, is memory. Whatever enhances that gift is of the highest service to us, and so I feel that photography has a value higher than its mere art value. I feel that the making and the preserving of those visible records that will recall after many years the images of well-loved friends, and bring back to us again and again the hours and the scenes when our lives were at the brightest and the best, need not be the trifling pursuit it is by many deemed to be; and with the lapse of years we shall be all the better, all the happier, if we can at will bring into the living present what to ourselves, if not to others, are the precious memories of a vanished past.

JAMES CRAIG.

SPA—A LIGHTLY TRODDEN PHOTOGRAPHIC PATH.

A PRETTY little village, about three hours' ride east of Brussels, with about 8000 permanent inhabitants, largely supplemented in the season, Spa, it is said, originated the name to all watering-places called Spas. One has only to get into one of the Great Eastern Railway carriages at Liverpool-street, and travel via Harwich, Antwerp, and Brussels, and in about seventeen hours he is at Spa, at an extremely small cost, viz., return, second class, 42s. 2d. He is amidst lovely mountain scenery, which, to judge from present appearances, has not been well or over-photographed, perhaps the pleasures of the gaming tables usurp all the attention of the visitors. Unlike Monte Carlo, visitors wishing to partake of the so-called vice must give notice of their intention to become members, and in forty-eight hours get a ticket, and pay twenty francs, which entitles them to win or lose as much money as they can, with free entry into the theatre, concert room, regatta, horse-racing, velodrome, golf gardens, &c. The gambling rooms are fairly well patronised, although the season is not in full swing until late in the summer. It is said to commence on May 1, but at present very few hotels are open. The gambling rules are much more liberal than at Monte Carlo, i.e., at roulette the minimum stake is two francs, maximum 6000 francs, and at certain hours of the day Zero on all stakes gives another chance for your money; the systemists should win, but they must have the capital and courage (?); which of these qualifications I lack your readers must form their own conclusions. The bathing arrangements are pretty complete. One may have a *bain à la Champagne*, *à la Russe*, not *à la Turc*, or a peat bath, said to be very efficacious in gout. I tried the latter, and, on my emerging, I had an unpleasant idea that I looked like a resurrected nigger; the most unpleasant sensation I had was a desire to use my *mouchoir* to wipe the perspiration from my brow or whisk a fly from my nose, but this was nearly out of the question on account of my sanguinary *noir* covering. I am getting out of my latitude.

I have only seen one hand camera, and there seems to be only one professional photographer here who advertises apparatus and materials, general, with use of dark room. I have just seen the greatest enthusiast (stereoscopic) I have ever had the pleasure to meet—le Comte Alberic du Chastel. I had an invite to his Castle. Until I visited him I was under the impression that my stereoscopic apparatus was the most perfect in the universe, now I will have to sing small. The Comte, as I have already mentioned, is a profound enthusiast—stereoscopic cameras, lenses by the best English makers. One particularly beautiful camera, and evidently his favourite, was made in Belgium. He takes all his negatives on 13 × 18 cm., prints them on glass only by development in the camera. The latter's dark slides have got double shutters so that one may remain open longer. His field camera has some unique points—the usual twin lenses, a rack to separate if desired, a rising front, a scale for focussing, a rack and pinion for focussing on ground glass, revolving dark-shutter slides, and, by turning a pin outside the camera, the stereoscopic partition is moved towards the end. A finder and a view-meter complete the camera. I suggested that it should have a swing back. He immediately exhibited an English camera, remarking "that, as the rising front was greater than is usual, it was unnecessary." The Comte is not exclusively a landscapist, but his studio is adorned with group studies, enlargements, bromides, ten to twenty diameters, that would make many professionals blush. The studio is quite detached, and in itself is a large villa. The Castle can only be compared to Eaton Hall or Chatsworth. Although the Comte cannot speak English and I am at a disadvantage with French, we got on well together. He gave me a pressing invitation to revisit him, and I am sure he would extend his hospitality to any artist or photographer who pleased to call. I was almost forgetting to say that hotel prices are very moderate. Excellent pension may be obtained from eight francs. I am sure that any one interested in photography will only cry encore, which I will echo with my camera.

Hôtel de Laeken, Spa, Belgium.

A. L. HENDERSON.

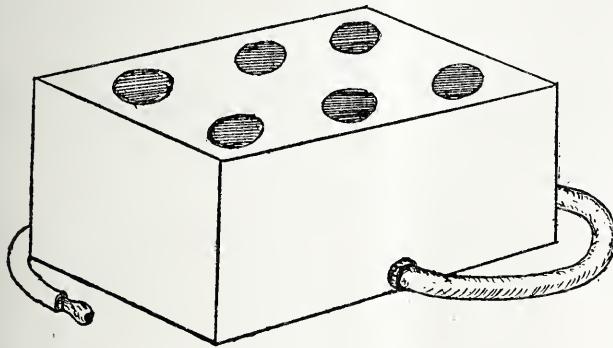
IMPROVED METHOD FOR MOUNTING PRINTS.

[A paper read before the Photographic and Microscopic Branch of the Franklin Institute.]

OFTEN the troublesome part to the amateur photographer is the mounting of the print. The cause of this is that, by the old method, it requires some practice, which he has not had, for the number of prints he has to mount is so small that he prefers to get them in shape for the album, especially after he has tried his hand at mounting the first few prints in the old way and making a mess of it.

Now, to remedy this trouble, I have contrived the device I have here this evening, and of which I will give you a brief description and a practical demonstration.

This invention is for the mounting of squeezed or other dry prints. The method has several advantages. It is very simple, neat, and clean; stops all daubing of the prints and leaves them and the hands quite clean. The mounts have less tendency to curl, and as the prints are quite stiff, they are more readily handled, and, if they are to be coloured, it may be done before they are mounted, and there is therefore less



danger of soiling the mount. To the inexperienced person this method is well adapted, since it requires but very little skill to make quite a neat job of it.

The arrangement consists, first, of a block of wood, which is called the squeezed print-mounter. This block is made about one-eighth of an inch smaller than the print to be mounted, and its upper surface is formed with a series of circular grooves, each of which is in communication with its neighbour, and the whole system in communication with the outlet pipe near the bottom of the mounter. To this outlet is attached a piece of rubber hose, and, to facilitate the handling of the prints, a small paddle is also added. To keep the prints more firmly in place, the upper surface of the mounter is coated with a solution of rubber cement, made quite thin with benzine. This coating must be renewed whenever the surface gets too smooth to hold the prints firmly.

To use this mounter, place the print upon it, face down, with the edges projecting all around, and on it, to hold it in position temporarily, place the paddle, then prepare the brush with as much paste as needed, after which place the rubber hose in the mouth and exhaust the air, this holds the print whilst applying the paste; after the print is pasted, apply the paddle to it, so that it may be readily transferred to the mount, place one edge in its proper position on the mount, and with the left hand hold it there until you remove the paddle, after which proceed as in the older method.

JOHN G. BAKER.

PHOTOGRAPHING A SPLASH.

"It would be difficult to imagine anything more commonplace to the ordinary observer than the splash of a drop, yet Professor A. M. Worthington's researches, extending over many years as they have done, and the first series of which were but recently completed, show that this apparently simple occurrence, when examined by the refined methods which science makes possible, is really a succession of bewilderingly beautiful phases, which, for their complete interpretation, require the resources of higher mathematical analysis. The same distinguished investigator has demonstrated that a variety of allied phenomena, while fundamentally dependent upon the same properties of matter, are all characterised by their individual peculiarities of changing forms, which can be reproduced at will by the experimenter." So says an anonymous writer in the May number of *Knowledge*. We can only afford space for one short extract, but those interested in the subject will find ample material, well illustrated, in the original article contained in the magazine referred to. "It is necessary to point out that the form of the splash depends very much upon the condition of the surface of the sphere. When a polished sphere of marble, rubbed very dry with a cloth just beforehand, is dropped into the water, the water spreads over the sphere so rapidly that it is sheathed with liquid even before it has passed below the general level of the surface. The splash is insignificantly small and of short duration; but, if the sphere be roughened with sand paper or left

wet, the water is driven away laterally, forming a ribbed, basket-shaped hollow, which, however, is now prolonged to a great depth, the drop being followed by a cone of air, while the water seems to find great difficulty in wetting the surface of the sphere completely."

SMITH'S NEGATIVE-WASHER.

[Patent No. 3382 of 1900.]

THE invention relates to the use of a revoluble water wheel, in connexion with and forming a part of a photographic washing machine, the construction and combination being such that the negative plates may be readily and conveniently placed therein, removed therefrom and securely held in position during the process of washing, the machine being equally well adapted to hold plates of varying size within predetermined limits.

a represents the base of the machine, which is preferably formed from bent wire, the base being oblong in shape as shown, the wire being bent upwards at the sides to form supports, *b b*. Attached to the upper ends of the supports are plates, *c c*, the plates being centrally bored to receive and support the ends of a shaft, *d*. A water wheel, *g*, consisting preferably of a series of buckets, *h*, rigidly attached to each other at the front and rear, is mounted upon the shaft by means of plates or bars,

FIG. 1.

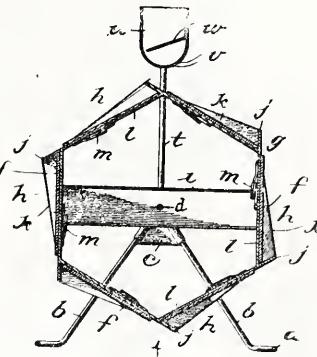


FIG. 2.

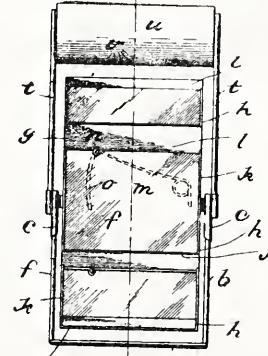
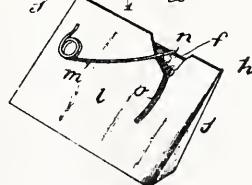


FIG. 3.



(fig. 1), extending diametrically across said wheel, and soldered or otherwise attached thereto. Each of said buckets is provided with a flat bottom, *l*, formed from sheet metal, and outwardly extended flanges, *j k*, the latter being tapered towards the front as shown.

Bent springs, *m*, are soldered at one end to the bottom of each of the buckets as shown, each of the springs having formed upon its free end a catch, *n*, which is projected through a slot, *o* (figs. 2 and 3), formed in the bottom of the bucket, said slot being curved to conform to the path of movement of the free end of the spring. The ends of the catches which project through the slots are bent so as to engage and overlap the edges of the negative plates, *f*, and to press the plates back against the flanges, *j*, or other suitable stops, so as to hold the plates in place during the rotation of the wheel. The flanges, *j*, preferably consist of extensions of the plates, *l*.

Vertical bores formed in the plates, *c c*, are adapted to receive detachable vertical wire supports, *t t*, to the upper ends of which is attached a trough, *u*, having a row or rows of perforations, *v*, in the bottom thereof, extending throughout its length. The trough is intended to be placed beneath a faucet, from which it receives a water supply. A

baffle plate, *w* (fig. 1), is formed in the trough, the plate extending from end to end, and nearly across the same, as shown, for the purpose of causing a more uniform distribution of the water than would otherwise occur. The object in making the trough removable is to render the device more compact for shipping purposes.

In placing the negatives in the buckets, the spring, *m*, is drawn out to the position shown in dotted lines in fig. 3. The negative, *f*, is then laid upon the bottom of the bucket, which is in effect the equivalent of an ordinary tray, with its rear edges against the flange, *j*, when the spring is released, which causes the front edge of the plate to be engaged by the catch upon the end of the spring, thus securing it in place.

PRODUCING MULTIPLE PHOTOGRAPHS.

[Patent No. 7431 of 1899.]

THE INVENTION OF HERR SZCZEPANIK.

An opaque plate, *d*, possessing suitably distributed holes (see fig. 2), is arranged between the objective and the image-receiving screen, consisting, by way of example, of a matt or ground-glass disc, *c*.

The figure or object of which a multiple representation is to be made may be formed by the diaphragm opening itself, or a transparent negative or diapositive of the object may be arranged in place of the diaphragm.

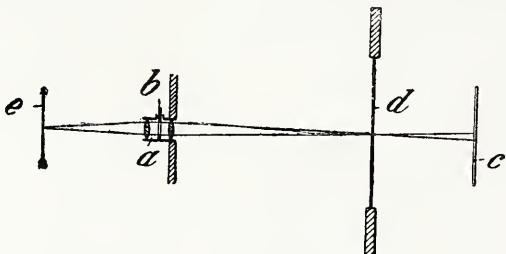


FIG. 1.

On illuminating, an image of the object appears on the matt or ground-glass disc for every hole in the plate; thus there are formed just as many copies of the object as there are holes in the plate, *d*.

If the openings in the plate, *d*, are near enough together, the diaphragm images combine to form a pattern, design, or ornament, as is shown in fig. 5.

The negatives or diapositives to be placed in the objective instead of

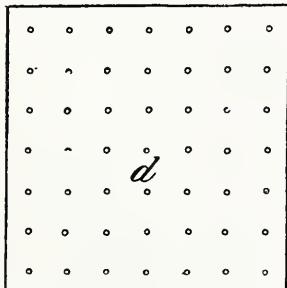


FIG. 2.

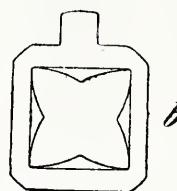


FIG. 3.

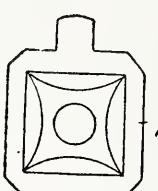


FIG. 4.

the diaphragm may consist of paintings on glass plates. If a sensitive photographic plate be used instead of the matt or ground-glass disc, then from one object, and by a single impression, as many photographs of the object can be obtained as there are holes in the plate, or a repeat design or ornament (fig. 5) can be produced.

It is possible to produce, by the method described, photographs that

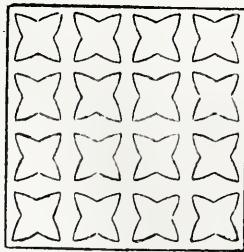


FIG. 5.

can serve different purposes, for example, for the production of prints as groundwork for documents, bonds, securities, &c., in so far as it is a question of multiplying or forming patterns with repeat designs or figures. As these impressions depend not only on the diaphragms, but also on the arrangement of the openings in the perforated plate, imitation is almost impossible.

MACAIRE'S NEW PHOTOGRAPHIC FILM.

So much interest is just now being taken in film matters that we append the specification of Mr. Macaire's patent (No. 12,152 of 1899) in full:—

The object is to produce a film which, without the employment of a glass plate or carrier, shall be free from grain and possess other advantages, as hereinafter explained.

Films of this class have hitherto, as is known, been mounted either upon glass, or upon carriers, or backings of paper, or other material, and, when backings of the latter class are employed, it is impossible to produce satisfactory enlargements of photographs taken upon the films, or pictures suitable for projection, on account of the transference of the grain of the backing to the gelatine of the film, which on enlargement or projection has the effect of spoiling the picture.

Now, I am able, while still retaining the advantages of the paper backing, to produce a film entirely free from grain, and from which satisfactory enlargements to any desired size, or pictures entirely suitable for kinematographic or lantern projection, can be obtained.

The films are particularly useful for film cameras and for kinematograph negatives and positives, since they can be made in any length, and, in the preferred construction, are cheaper than celluloid, though celluloid may be employed in their manufacture if desired. Further, the improved films, in their preferred construction, are entirely unflammable, and thus render kinematographic projection perfectly safe.

It is possible to obtain equally sharp impressions from either side of the film, which will be found useful for carbon and process work. Further, the positive made upon the improved films can be used for crystoleum work without any preparation.

I take a sheet, band, or reel of backing paper, which should be of good manufacture, and made from pure rag pulp. Upon this I spread, by any convenient means or apparatus (such, for example, as the machines employed in the manufacture of fancy papers, which are so well known as to require no further description), a coating, or it may be two or more coatings, of a mixture of gelatine and barium sulphate, the gelatine being rendered insoluble by chrome-alum or other suitable agent; or, instead of gelatine for this coating, I may use any other suitable colloidal substance capable of being rendered insoluble; or I may first apply a coating or coatings of a mixture of soluble gelatine or other suitable colloidal substance, and barium sulphate, and, when this is dry, superpose thereon a coating of insoluble gelatine or insoluble colloidal substance. After allowing the coating last applied to dry, I apply an impermeable coating of wax, rubber, gum, resin, or the like, dissolved in benzine or other solvent, and, after allowing the solvent to evaporate, I apply a coating of collodion, or, by preference, alternate coats of collodion and gelatine or casein until the desired thickness has been obtained. This may be effected by dissolving the gelatine in water or casein in alcohol. The gelatine or casein should be rendered insoluble in water by the addition of a suitable agent, such as formalin. The outermost coating should contain the sensitising material or serve as the carrier therefor.

There is a special advantage in applying alternate coats of collodion and gelatine or casein in the manner above described, since I thereby obviate any stretching of the film lengthwise or transversely.

I prefer films having upper coatings of collodion and gelatine or casein as described above the impermeable layer above referred to, but I may employ celluloid in place of the coats of collodion and gelatine or casein. For this purpose I may apply one or more coats of celluloid upon the impermeable layer, according to the thickness desired. The celluloid will be applied in solution in a suitable medium such as acetate of amył and acetone with benzine. The outer layer is sensitised as before.

The paper backings which I employ are by preference black or of non-actinic colour. This has the great advantage of enabling rolls of film to be introduced in broad daylight into or removed from film cameras, and in the case of packets of film of preventing the daylight passing through the paper or other backing of a film exposed thereto and injuring the films behind. Halation, which is so serious a matter in producing photographic images for enlargement and the like as hitherto upon glass backings, is also thus prevented.

Any suitable apparatus may be employed for applying the various coatings to the paper backing, and when these have all been applied the band or sheet may be cut up into sizes suitable for the requirements of the photographic trade.

The films, after being exposed in the camera upon their backing, may be stripped therefrom and developed, intensified, reduced in intensity, fixed, washed, and finished, just as if they were upon glass, so that it is possible to readily follow and control the progress of these various operations, and thus obtain greatly improved results.

After washing and finishing the exposed film I prefer to pass it into a solution consisting of glycerine five per cent., formalin five per cent., water and alcohol. The film is then placed upon the original paper backing, which may be retained for the purpose, and allowed to dry in the air; this will impart perfect rigidity and smoothness to the film. When it is dry, it may be again stripped from the backing, and the result is a perfectly bright and rigid film entirely free from grain.

The films are particularly adapted for advertising and decorative purposes, since the difficulty experienced hitherto of enlarging transfers such

are required for the purpose, and which difficulty is due to the transference of the grain of the paper backing, is obviated. In employing my improved film for advertising or decorative purposes, it is only necessary to moisten the film and cause it to adhere to the desired surface, say, a painted iron tablet, by placing the gelatine face inwards thereon, and applying pressure. The paper backing may then be stripped off, leaving the film adhering firmly and evenly to the surface. The film should then be varnished.

The film may, if desired, be strengthened after exposure and finishing, by a surface layer of gelatine applied thereto in the well-known way.

Our Editorial Table.

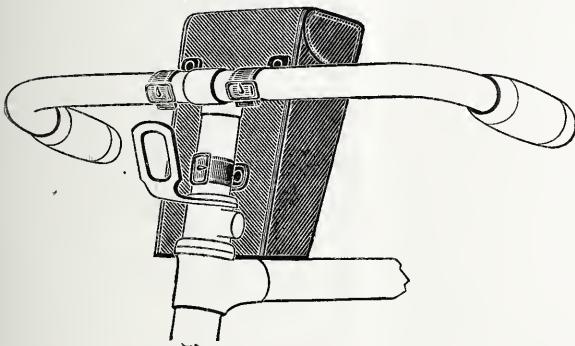
MESSRS. GEORGE HOUGHTON & SON, of 88 and 89, High Holborn, W.C., are issuing a clearly written pamphlet descriptive of the special features of the Sanderson Hand Camera, which we recently noticed in these columns.

MESSRS. R. & J. BECK, LIMITED, of 68, Cornhill, E.C., are issuing a special catalogue descriptive of the Beck-Steinheil orthostigmatic and other photographic lenses, prisms, &c.

THE No. 8 PRIMUS CAMERA.

Manufactured and sold by W. Butcher & Son, Blackheath, S.E.

THIS little instrument, which, with three double slides and a case, sells for two guineas, is especially designed for cycling photographers. In the illustration it is shown so attached to a cycle that it may be removed from the case without unstrapping the latter from the machine. Of field-glass shape, the body of the camera, which is morocco-covered, may be compressed by the movement of two internal supports. It is made for



quarter-plate pictures, and the slides are of the metal form devised some years ago by Mr. B. J. Edwards. The single lens, of about five inches focus, is controlled by a rotating diaphragm with three apertures, and the shutter, which is of the go-and-return variety, admits either of time or instantaneous exposures. The camera is light, portable, and well made, and the cycling photographer who requires a simple form of instrument should find the No. 8 Primus to his taste. It has a view-finder, and the slides may be packed inside the camera when the latter is not in use.

THE BARNET PLATES AND PAPERS.

Elliott & Son, Barnet, N.

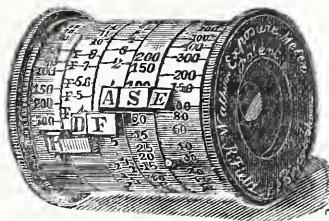
WITH many pleasing illustrations made from negatives taken on the Barnet plates, this little book in its striking coloured cover has yet other claims on our favourable notice. The developing and other formulae are expressed in both the Imperial and the metric systems on a basis of 1000 c.c. of water throughout. The latter point is one that should always be borne in mind by those compiling formulae on the metric system. Moreover, the approximate speed numbers of Messrs. Elliott's plates are given for the H. & D., Wynne, and Watkins systems. The price-list is of general as well as particular service, and we must congratulate Messrs. Elliott on its taste and utility.

THE WATKINS STANDARD EXPOSURE METER.

Manufactured and sold by R. Field & Co., 142, Suffolk-street, Birmingham.

THE latest pattern of this beautiful little instrument, the utility and ingenuity of which will assuredly perpetuate the name of Alfred Watkins in photography, lies before us. Messrs. Field draw our attention to the fact that the instrument has been greatly reduced in length and weight

without compression or curtailment of the scales, and, while being quite as complete as before, it is now more portable; in fact, the meter has been given the utmost possible portability without impairing its efficiency, and it may be carried in a waistcoat or ticket pocket with no inconvenience. It is so long since the Watkins exposure meter was reviewed in our columns that a brief description of its functions and the manner in which they are exercised may not be out of place. It is taken from the explanatory pamphlet: "The instrument consists of a simple actinometer for testing the light, a chain pendulum for counting seconds or half-seconds (for timing both the actinometer and camera exposures), and five movable calculating rings carrying pointers, P, D, S, F, and A, which, when adjusted to the numbers representing the value of each factor, causes a sixth pointer, E, to indicate the correct exposure. It is a means of calculating variations from one test exposure. The basis of the calculation is a test of the light which is actually illuminating the shadiest part of the subject to be photographed, and the first thing to do, therefore, is to test the light: Unfasten the lid of the pendulum box, and allow it to swing, then hold the actinometer to face the source of the



light which falls upon the subject, not to face the subject; pull out a fresh surface of sensitive paper under the aperture, and at the same instant count 'nought,' continue counting 'one, two,' &c., in time with the swing of the pendulum (counting at one end of the swing only for seconds). The number of seconds taken for the paper to darken to the standard tint is the actinometer or A number. In testing the light the depth of tint is the important point. The paper darkens rapidly in light; up to a certain point it is lighter than the standard tint, after this point it is darker. The point when it is neither lighter nor darker is that to be timed."

In photography, of all the vital conditions for success not one ranks with such importance as accuracy of exposure. This little meter, with its five factors, and the simple manner in which they may be estimated conjointly with the darkening action of light on a thin strip of excited paper, places at the command of the photographer a most valuable power, for, intelligently used, he need scarcely ever spoil a negative, lantern slide, copy, or enlargement, by gross error of exposure. Our experience and our opinion of the meter is that it ought properly to form part of every photographer's equipment. It is well worth the 15s. charged for it.

CATALOGUE RECEIVED.

J. Lizars, 101 and 107, Buchanan-street, Glasgow; London, Edinburgh, Aberdeen, and Belfast.

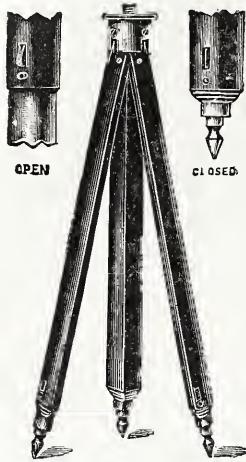
THE handsome catalogue of Mr. Lizars, which extends to nearly 200 pages, is especially noticeable from the fact that it gives many half-tone illustrations made from negatives taken in the well-known Challenge cameras. These negatives were obtained by about a dozen clever photographers, amongst whom such expert workers as Mr. W. M. Warneuke, Dr. J. Cowan Woodburn, Mr. C. Chapman, and Mr. W. L. Primrose, are prominent. A glance at the photographs, some of which have been medalled, shows that the Challenge cameras could not have a more eloquent series of testimonials, for the work throughout is of the highest class, including, as it does, examples of landscape, seascape, group, and portrait photography. The catalogue itself is a comprehensive guide to the selection of photographic apparatus, and it contains, besides, much information relating to formulae and practical hints, thus constituting it a useful reference book for amateur photographers. A special feature is made of illustrating and enumerating the more recent forms of Mr. Lizars' cameras. The catalogue appeals alike to professionals and amateurs, and is sent free on application.

CAMERA TRIPOD OF ALUMINIUM OR BRASS.

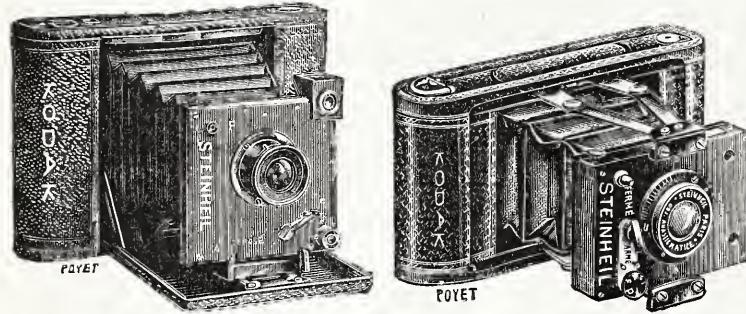
Supplied by Arthur Rayment, 125, Earlham-grove, Forest Gate, London, E.

THE stand shown overleaf may appear familiar to our readers, but upon close inspection it will reveal the fact that a new and decidedly advantageous locking and releasing device has been substituted for the well-known form, with internal and external springs, hitherto employed. The old form of outside spring is very liable to be pushed out of its place or broken. The method of opening the new stand is by simply drawing out the tubes telescopic fashion, when a duplex catch secures the rigidity of the jointed connexions. The closing is effected by pressing the duplex catch, which simultaneously releases all the jointed connexions, and permits the instantaneous closing of the legs to their minimum length

of $1\frac{1}{2}$ inches, so making this a most portable as well as light and convenient camera stand, which, from personal examination, we can strongly recommend to those of our readers who appreciate portability and compactness in photographic apparatus.



Mr. Rayment has also brought under our notice two Eastman's Kodaks, Nos. 1 and 4 of the Folding Series, fitted by Messrs. Steinheil & Son with their orthostigmatic lenses and patent shutters. The lenses, though working with very large apertures, render crisp definition to the margins of the field, this important desideratum being ensured by an efficient



arrangement for obtaining exact focal adjustment. The shutters give prolonged exposures as well as varying speeds of instantaneity. Mr. Rayment asks us to add that he is agent for the Paris branch only of the firm of Steinheil & Son.

** Great pressure on our space this week again obliges us to hold over several reviews, notices, &c.

Studio Gossip.

THE TANQUERAY FREE - PORTRAIT SCHEME.—We have to thank Mr. J. Thomson, of 70A, Grosvenor-street, W., and Mr. F. Ralph, of Dersingham, King's Lynn, for batches of "Tanqueray" literature. We have over and over again drawn the attention of readers of the JOURNAL to the nature of the Tanqueray free-portrait scheme.

PHOTOGRAPHERS ON NAVAL BRIGADE DAY.—Writing of the crowd assembled in Trafalgar-square to welcome the Naval Brigade on Monday week, Dagonet, in the *Referee*, says: "From my point of vantage I had an excellent opportunity of studying the kodakers. I had no idea they were such an adventurous body. They climbed lamp-posts, they hung over the parapets of seven-story buildings, they balanced themselves on railings at the imminent risk of impalement. In the centre of the Square, in a spot commanding a view of the approach from Whitehall, one kodaker had improvised a human ladder. A big, broad-shouldered man was at the base, on his shoulders a second man was seated. The kodaker climbed up the men and seated himself on the shoulders of the second. It was a daring feat. At any moment there might have been a serious accident."

PHOTO BUTTONS.—Our contemporary, the *Professional Photographer*, gives the following outline of the method for producing photo buttons, which are very popular just now in the United States:—"A 5×8 plate is generally used to the best advantage, placing upon same from one to forty-five exposures of the standard-size buttons. The celluloid used in covering costs seventy cents a sheet (this is sufficient for about one thousand small-sized buttons); the backs used for same can be had from forty cents a gross up. The prints are dipped into a solution of alcohol; they are then united to the

celluloid by the aid of an adhering roller, which works on the same principle as a burnisher. After once united it is placed on a block and cut out by a circular die; it is then placed in a machine that is so simple that it can be operated by any child almost able to stand on its feet. The machine has the capacity of turning out twelve thousand buttons a day. When not in operation, no expense is connected with it whatever, and the space it occupies is so small that any vacant corner in a room would be sufficient. The different sizes made to-day range from one-fourth of an inch up to nine inches in diameter, most of them being round, but some of the late additions being oval-shaped."

THE SPEAGHT GALLERIES.—The whole of the well-known building, known as 178, Regent-street, has just been entirely redecorated, most of the work having been done at night so as not to interfere with the general carrying on of the business. The woodwork of the staircase, like that in other parts of the building, is painted ivory white, the doors being picked out in a peculiar shade of dark green. Each door has fixed to it a carved tablet with the purpose for which the room is used written in gold. The walls of the staircase, which are painted a rich Indian red, are covered with numerous pictures. The colour of the stair carpets and draperies harmonise with the colour of the walls in a capital manner. There is a fernery outside the galleries on the first floor, with a fountain playing. The whole of the first floor is occupied by the galleries. The walls are painted a soft sage green, frieze having been formed by a shelf fixed round the walls, about three feet from the ceiling, upon which have been arranged some pieces of pottery. The second floor is reserved for the lady artists; the third floor for the dispatch, mounting, finishing, and housekeeper's rooms; on the fourth floor one comes to the various dark rooms, the Peacock and Rose dressing-rooms, and then the visitor enters the Divan, where clients are served with afternoon tea previous to entering Mr. Richard Speaight's studio. Special accommodation is arranged on the roof of the building for the printing from the negatives, all the photographic printing being done on the premises.

A WELL-KNOWN BIRMINGHAM PHOTOGRAPHER.—The current number of the *Birmingham Magazine* is, as usual, beautifully produced, and contains, among many other articles of local interest, one devoted to Mr. H. J. Whitlock, Birmingham's first photographer. "There are few," says our contemporary, "who have such a record as Mr. Whitlock. To be appointed photographer to both Her Majesty the Queen and His Royal Highness the Prince of Wales are exceptional honours, and to be commanded to photograph a series of views of and about the royal residence at Balmoral, and of the royalties, there, is a pleasure enjoyed by few. Some of the pictures thus taken illustrate the Queen's own book, *Leaves from a Highland Journal*; and, when in 1874 His Royal Highness the Prince of Wales visited Packington, a further Royal command was issued for another series of views and portraits at that stately home of Warwickshire. Mr. Whitlock's studios have been visited by a long series of mayors and the Lord Mayors and other governors of the city. The portraits of all the Judges and other notables who have visited Birmingham form a magnificent gallery of prominent people. In fact, in no other studio than that of Mr. H. J. Whitlock, have so many important portraits been taken. Very largely has Mr. Whitlock's work been that of taking photographic records of not only the principal places and buildings of the city, but an innumerable variety of business and private establishments, which together form such a collection as to constitute a picture history of the progress of the city for the period embraced. Further, his collection of photographic records of public and private functions is unique—laying of foundation-stones, openings of public buildings, royal and other receptions, processions, banquets, weddings, and, most recently, groups of khaki-clad warriors for South Africa. These latter include a very fine group of the Warwickshire Imperial Yeomanry, taken at Warwick Castle on the day previous to their sailing from Liverpool. In addition to the New-street establishment, Mr. Whitlock has a branch studio at 201, Broad-street, under the management of his son, who is the representative of the third generation of photographers of that name, and here again is a record, for photography itself has only just completed its second generation."

News and Notes.

THE ANNUAL CONVERSAZIONE.—The Annual *Conversazione* of the Society of Arts will be held at the Natural History Museum, South Kensington, on Wednesday evening, June 20.

THE ANNUAL DINNER.—The Annual Dinner of the Camera Club was held on Thursday, May 10, in the Club-room at Charing Cross-road, under the chairmanship of the President, Sir W. de W. Abney, F.R.S.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, May 23, 1900, at 7.30 o'clock, Mr. G. J. T. Walford, "Control in Photographic Printing," illustrated by lantern-slide examples.

THE OLDER READERS.—The older readers of this JOURNAL will be interested to know that one of its most valued supporters, Mr. W. J. Stillman, who has been obliged to drop photography during the past year from press of literary work and instability of residence, has permanently located himself in Surrey, and has resumed photographic pursuits.

THE SPECIAL SUMMER NUMBER.—This year's Special Summer Number of the *Studio* is to be devoted to "Modern British Water-colour Drawings." The illustrations will include examples of the work of all the most prominent contemporary water-colour painters, and an important feature of the number will be the coloured reproductions, of which there will be no fewer than twelve.

ROYAL PHOTOGRAPHIC SOCIETY.—Tuesday, May 22, a Note by Mr. Alfred Watkins, entitled "Hydroquinone and Colour Impressions," will be read. The Exhibition of pictures by Mr. F. H. Evans will remain open until

Saturday, May 26, from ten to four p.m. (Wednesdays, eight p.m.). On Tuesday, May 29, Dr. P. H. Emerson will open an exhibition of his work, at eight p.m., and will give an address.

HOW EX-PRESIDENT STEYN TREATED HIS BURGHERS.—Prior to the Boer exodus from Kroonstad, ex-President Steyn vainly implored the Free Staters to continue their fight for freedom. Threats and cajolery were alike futile. Finally Steyn became quite mad with rage, and kicked and cuffed the faint-hearted burghers. An enterprising photographer in the town took a snap-shot of the scene, which plainly shows Steyn striking his burghers.

MESSRS. G. WEST & SON inform us that their well-known entertainment, "Our Navy," will be given at the Agricultural Lesser Hall at the same time as the Military Tournament, which opens next week. We are pleased to learn that this exposition of life in the Royal Navy has greatly stimulated recruiting throughout the various towns in the country. It has also been exhibiting for the past eight months at the Royal Polytechnic, Regent-street.

PROFESSOR RÖNTGEN.—*Nature* states that the U.S. National Academy of Sciences has decided to award the Barnard medal to Professor Röntgen for his discovery of the X rays. This medal is awarded at the close of every quinquennial period for a discovery in physical or astronomical science, or novel application of science to purposes beneficial to the human race. The first presentation of the medal was to Lord Rayleigh and Professor Ramsay for their joint discovery of argon.

PHOTOGRAPHY WITHOUT LIGHT.—At the meeting of the Photographic and Microscopic Section of the Franklin Institute, on April 3, a communication was presented by Dr. Martin J. Wilbert on "Photographing Without the Aid of Light." Among the experiments shown was one in which a coin was heated and then enclosed with a sensitive plate in such a way as to entirely exclude light, with the result of producing a negative in which the heat waves are supposed to have been the active agent.

THE MEISENBACH ARTISTIC DISPLAY IN ADVERTISEMENT COMPETITION 1900.—The following are the Judges' awards: 1. "Rex," W. S. Wilson, with Messrs. R. E. Thomas & Co., White-street, Moorfields, E.C., first prize, 20/- 2. "Nubian," W. S. Wilson, with Messrs. R. E. Thomas & Co., White-street, Moorfields, E.C. (disqualified from taking second prize of 10/-, owing to being first prize-winner). 3. "Galley," S. Martin, with Messrs. Cooper & Budd, Limited, McDermott-road, Peckham, S.E., second prize, 10/- 4. "Peckjoy," George Joyner, of Messrs. Joyner & Wenham, 27, High-street, Peckham, S.E., third prize, 5/- An Exhibition of the specimens will be on view at the St. Bride Foundation Institute, Bride-lane, Fleet-street, London, E.C., till Saturday next, May 19. Admission is free. The whole of the 220 designs submitted in this Competition, together with the Judges' reports, will be published in book form, price 1s., post free. Application for copies should be addressed to The Secretary, The Meisenbach Company, Limited, West Norwood, London, S.E.

MR. CHARLES HYATT-WOOLF.—*The Dioptric and Ophthalmometric Review* for April contains an excellent portrait and a brief biography of Mr. Charles Hyatt-Woolf, the editor of the *Optician and Photographic Trade's Review*, from which we learn that he is thirty-six years of age. Mr. Hyatt-Woolf devoted some portion of his career, subsequent to his undergraduate days, to the study of medicine and law, his inclinations leading him ultimately into journalism. He has owned a variety of newspaper properties, and nine years ago inaugurated the *Optician and Photographic Trade's Review*, in the editing of which his early training in physics stood him in good stead. Almost simultaneously with the appearance of this publication Mr. Hyatt-Woolf produced *Science Siftings*, a weekly paper which conveys science to the general reader in a popular form. Its success has been very remarkable. Mr. Hyatt-Woolf is also the author of a book on alimentary chemistry, which has passed into its fifth edition, besides other works of varied nature. In addition to his labour of editing the two newspapers already mentioned, he writes many of the technical and trade articles and paragraphs in them, and finds time for contributing to the political and social press. His optical work, however, gives him the greatest satisfaction, and he ranks himself proudly as an optician of ten years' standing, this being the period when the *Optician and Photographic Trade's Review* was first projected.

PHOTOGRAPHIC CLASSES AT THE GOLDSMITHS' INSTITUTE, NEW CROSS, S.E.—We are informed that a class for elementary and advanced students of practical photography will be held by Mr. W. T. Wilkinson on Saturday afternoons, from 4.30 to 7.30; and on Monday evenings, from 7.30 to 9.30. The Saturday afternoon meetings are for the purpose of doing daylight work at the Institute on printing in P.O.P., carbon, platinum, &c.; copying, portraiture, &c.; and for the purpose of practical instruction in landscape, architectural, and snap-shot photography in Greenwich Park, Blackheath, the river-side, &c. The Monday evening meetings are for dark-room work, such as developing the Saturday exposures, printing in bromide, Gravura, retouching, intensifying, and reducing negatives, enlarging, toning, mounting, &c. The class dates are May 21 to July 7. The photographic studio and dark room are fitted with electric arc lamps for copying and portraiture. The department is provided with studio, landscape, lantern slide, and copying cameras, an enlarging lantern, and a powerful electric projection lantern. It also possesses complete outfits for photo-lithographic and collotype work, for platinotype and carbon printing, and for retouching and other branches of modern photographic practice. Students provide their own sensitive paper and plates, but all chemicals required are furnished by the Institute. The fee for the course (twelve meetings) is 12s.

THE BLAIRGOWRIE EXHIBITION.—We had occasion to comment very favourably on the last Exhibition promoted by the Blairgowrie and District Photographic Association, and, if enthusiasm and ability for hard work tend to success, the forthcoming Exhibition, which the Association has arranged for January 14-19, 1901, ought to rival its predecessor. Messrs. John B.

Maclachlan and D. J. Monari, who were in the thick of the work at the last Exhibition of the Association, have been appointed joint Secretaries. The schedule of classes is as follows:—Open to all: A, Champion (open to prints which have previously taken a first prize in an open exhibition); B, Architecture, exterior and interior; C, Instantaneous work, subject showing evidence of motion; D, Flowers, Fruit, and Still Life; E, Stereoscopic work, in sets of three (award for best individual print or transparency); F, Lantern slides, Champion (open to slides which have previously taken a first prize in an open exhibition); G, Lantern slides, in sets of four (award for best individual slide); H, Lantern lecturette (particulars on application to the Secretaries). Open to professionals: J, Landscape or Seascapes; K, Portraiture or Figure Studies, including animals. Open to amateurs: L, Landscape or Seascapes; M, Figure Studies or *Genre*, including animals. Open to members: N, any subject. Enlargements may compete in any class. A silver and a bronze medal and a diploma are offered for competition in each class. The Association also offers as a special prize a gold medal, value five guineas, for the best picture in the Exhibition, the picture to become the property of the Association for addition to the permanent collection in the Association Club-room.

THE ROYAL CORNWALL POLYTECHNIC SOCIETY'S SIXTY-SEVENTH EXHIBITION.—The Royal Cornwall Polytechnic Society's Sixty-seventh Exhibition will open at Falmouth on Tuesday, August 21, 1900. With a view to encourage workers in arts and crafts, a considerable amount of space will be set apart in the Exhibition for the display of specimens of handicraft by members of classes associated with the Home Arts and Industries Association, exhibitors under the Arts and Crafts Exhibition Society, students in Technical Instruction Classes under County Councils (especially in Cornwall), and others. Medals and prizes are offered in several departments, including photography (photographs by professionals and by amateurs, and photographic apparatus). The following is the schedule: In all cases state whether the work is professional or amateur, and name process of production. All work sent for competition must have been executed within eighteen months of the date of this Exhibition. *Carte-de-visite* portraits are excluded from exhibition, except when illustrating some special process or novelty. All enlargements for competition must be the work of the exhibitor. Regulation 5 does not apply to the Photographic Department. Information respecting the Photographic Department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate (member of the General Committee). Professional.—Medals in the following subjects: Outdoor Photography—1, Landscape, not less than 20 x 16 inches; 2, Landscape, 12 x 10 inches and under; 3, *Genre*; 4, Architectural (exterior); 5, Instantaneous, including marine; 6, Animals; 7, Enlargements. Indoor Photography—1, Portraits, not less than 20 x 16 inches; 2, Portraits, 15 x 12 inches and under; 3, Home Portraiture; 4, Still Life, flowers, &c.; 5, Interiors, architectural or otherwise; 6, Enlargements. Amateur: 1, Landscapes; 2, Architectural, exterior or interior; 3, Alpine Scenery, including Caucasian; 4, Hand-camera Work, not less than twelve examples quarter-plate; 5, Instantaneous, including marine; 6, Still Life; 7, Enlargements. Apparatus: Photographic apparatus generally, including the lantern and its appliances.

Commercial Intelligence.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. Theodore Harris, Belhaven, Shepherd's Hill, Highgate, for his negative, *Procession entering Canterbury Cathedral*.

In the Westminster County Court last week Judge Lumley S. Smith, in the case of Newman *versus* The Taber Bas Relief Co., at the instance of Miss Ethel Newman, recently engaged in the *Belle of New York* Company at the Shaftesbury Theatre as under-study to Miss Edna May, granted an injunction against the defendants to restrain them from publishing Miss Newman's photographs on Christmas and birthday cards.

Re A. H. COX, photographer, Weymouth.—This debtor made an application for his discharge at the Dorchester Bankruptcy Court on Wednesday last, before his Honour, Judge Philbrick. It appeared that the receiving order was made in 1893, and, on the whole, the debtor's conduct under the bankruptcy proceedings had been satisfactory, but the Official Receiver called his Honour's attention to the fact that the debtor, at his public examination, refused to answer a question, with the result that the Registrar threatened to adjourn the examination *sine die*. In allowing the examination to be closed, the Registrar expressed the opinion that the debtor was a man totally unfit to go into business again. He did not oppose the discharge, but he thought his Honour should be made acquainted with the facts. His Honour said he noticed that the debtor executed a deed of assignment in 1891, and in 1892 he obtained an administration order. Under the present bankruptcy proceedings the creditors had only received a dividend of 2s. 11d. in the pound. Debtor was questioned by the Official Receiver as to certain goods he had in his shop when he filed his petition. Debtor explained that they belonged to his mother, but had been taken by his sister, Julia. She had also taken other articles belonging to his parents. He did not know her present address. His sister claimed the things under a deed of gift. His Honour remarked that, if the Official Receiver thought the goods belonged to the debtor's estate, he must get the deed of gift set aside. As matters stood, the debtor had, no doubt, offended against the Bankruptcy Act in more than one respect, but his conduct under the proceedings had been generally satisfactory, and he only intended to suspend his discharge for six months more than the statutory period, therefore he should grant the certificate subject to a suspension of two and a half years.

Patent News.

THE following applications for Patents were made between April 30 and May 5, 1900:—

PHOTO-MECHANICAL PRINTING.—No. 8088. "An Improved Photo-mechanical Process for Producing Printing Surfaces." Complete specification. E. Vogel.

FOCUSING.—No. 8099. "New or Improved Method of and Means for Focusing in Photographic Cameras." A. L. ADAMS and W. WATSON.

PROJECTION.—No. 8137. "A Method of Showing Titles Beneath Lantern Slides and other Transparencies, and for the Projection of Titles to Appear in White on Screen." THE PHOTOGRAPHIC ASSOCIATION, LIMITED, and J. LE COUTEUR.

LIGHT FILTER.—No. 8171. "Improved Light Filter or Screen for Photographic Purposes." H. RHEINLANDER.

FILM-HOLDER.—No. 8039. "An Improved Photographic Film and Print-holder." W. F. CRAWFORD.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
21.....	Cripplegate Photo. Society	Prize Lantern Slides.
21.....	South London	<i>How a Lens is Made.</i> C. P. Goerz.
22.....	Hackney	<i>Pictorial Photography in Practice.</i> A. Horsley Hinton.
22.....	Isle of Thanet	Exhibition of Members' Work.
22.....	Leeds Photo. Society	Demonstration: <i>The Carbon Process.</i> R. Stockdale, M.A.
22.....	Royal Photographic Society	<i>Hydroquinone and Colour Impressions.</i> Alfred Watkins.
23.....	Croydon Camera Club	Demonstration: <i>A New Make of Collodion-chloride Print-out Paper.</i> C. Woodhead.
23.....	Photographic Club	<i>Control in Photographic Printing.</i> G. J. T. Walford.
24.....	Ashton-under-Lyne.....	Meeting to Examine and Discuss the Results of Ramble to Hattersley.
24.....	London and Provincial	Open Night.
25.....	Croydon Microscopical	Photographic Chat.
26.....	Ashton-under-Lyne.....	Excursion: Delamere Forest. Leader, H. Rausch.
26.....	Borough Polytechnic	Excursion: Crohamhurst. Leader, E. G. Hawgood.
26.....	Liverpool Amateur	Excursion: Eastham. Leader, E. Simnett.
26.....	South London	Excursion: Olaygate and Oxshott. Leader, S. Whiteman.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 10.—Mr. J. S. Teape in the chair.

MR. WALTER D. WELFORD showed some negatives reproduced in carbon on celluloid films, and pointed out a crowd of blotches which covered the whole of the negatives. There was considerable discussion as to whether they were the result of faulty tissue, deterioration of good tissue, or blisters, which, drying down, had taken a double edge.

MR. T. E. FRESHWATER projected on the screen some of his experiments in colour photography by the Joly process. The chief difficulty that he had encountered was in registering the viewing screen with the positive transparency. An interesting slide shown by him was one of a piece of gold quartz tinted in the colours of the original. Finally he exhibited some lantern pictures of the Paris Exhibition, showing the various styles of the buildings of the different countries taking part in the show, and many general views particularly interesting at the present time. The slides, he explained, were albumen slides.

MR. J. W. HODGES contributed some slides of Winchester, Bournemouth, Christchurch, &c., including one of the Great Globe at Swanage, standing sixteen feet high.

MR. H. C. RAPSON showed a collection of miscellaneous slides by the carbon process in red chalk.

PHOTOGRAPHIC CLUB.

MAY 9.—Mr. Hans Müller in the chair.

MR. E. A. NEWELL showed one of the Continental picture post cards now so commonly used, in order to ascertain by what process the view and decoration was produced. Some interesting facts concerning these cards were elicited in the discussion which took place. It appears that in some districts people make a practice of selling these cards in the summer months to the tourists, who have acquired a habit of addressing from every place they visit postal mementoes in this form to their friends. On the Continent so greatly has the custom grown, that the sale of the unstamped cards, at prices ranging upwards from a penny, is sufficiently lucrative to go a long way

towards the keep of the vendors in the winter months, when little business of the sort is done. The wholesale prices are from fifteen to seventeen shillings a thousand upwards.

THE CHAIRMAN related a tale, from which it appeared that, as the result of a wager made by some officers in Baden-Baden, 120 differently illustrated post cards of the immediate vicinity were collected in fifteen minutes, showing the popularity of the custom.

MR. NEWELL, referring to the process of copper toning recently brought forward by Mr. W. Bates Ferguson, spoke of it as most fascinating and easy to work. Very inferior bromides were greatly improved by its treatment, and the range of colour was considerable. During the first minute a light sepia tone would prevail, extending gradually to the reds in the space of three or four minutes. He noticed that the colour went right through in some cases to the back of the print. He did not look on the process as one suited to landscape work, but for some classes of photograph the colours were very appropriate.

Speaking of colour in prints brought up the question of colour in negatives and their estimation in printing.

MR. MACKIE said that some ortol negatives were very similar to pyro negatives. He did not consider that in the long run ortol was any more expensive than pyro.

MR. F. A. BRIDGE considered that the task of estimating the printing value of a brown negative when accustomed to blue-back, was as difficult as when dealing with a brown-tinted background after long being accustomed to grey or neutral tints. The question of colour in these matters was a very deceptive one, and wanted a lot of experience.

Croydon Camera Club.—May 9.

THE HAND CAMERA IN 1900.

This was the subject which engaged members of the above Club. It took the form of a series of descriptions of various patterns, mainly new, of hand cameras, together with the exhibition of a considerable number, and much discussion on the efficiency of various expedients for obtaining splendid snapshots. The PRESIDENT, somewhat paradoxically, stated that, in order to obtain an excellent result with a hand camera, the *desiderata* were small stops, slow plates, slow shutters, but a fast light; but, as a rule, at least two out of the four factors were usually perforce sacrificed, hence most snap-shots had to be considered as compromises; and, because small stops were not usually possible for this class of work, it became necessary to employ a lens possessing brilliant definition to the edge of the plate. But he warned his hearers that not even the most expensive of anastigmats would produce a negative showing depth of focus unless stopped down. Amongst the many hand cameras described, MR. BEN E. EDWARDS brought forward a magazine box camera, which seemed to possess capital features, including that saving virtue of a reliable changing mechanism. It was said to be possible to expose and change twelve plates in thirty seconds. The above, known as the Cyko, costs but 35s. MR. DUNMORE gave an exhaustive description of the Tella hand camera, which surely must include all that is best in a hand camera if one may believe this enthusiastic advocate. Any how, his hearers envied him the facilities which the camera lately offered him of taking 500 negatives in five days. The No. 1a Pocket Kodak was shown and explained by the PRESIDENT, and elicited favourable opinions, but more interest was shown in the remarkable little Brownie hand camera, which, made by Kodak, Limited, will take an excellent snap-shot two and a quarter inches square upon a daylight cartridge, and yet lens, instantaneous shutter, film-winder, and all cost but 5s. Pictures taken with it were handed round, which were a good deal better than most of the photographs as printed in our weekly newspapers. A big step was taken in passing from the Brownie camera to the Goerz-Anschütz camera, which is an instrument not only made in the most perfect fashion, but fitted with a lens which alone costs a matter of 67. A handsome album of reproductions from negatives taken by the above spoke most eloquently for the splendid efficacy of lens and shutter. The latter, by the way, is of the focal-plane type. The camera, which may be carried in the pocket and brought into use at a moment's notice, was considered the best pattern shown for high-class work, requiring extreme shortness of exposure and sharpness of definition. Another Goerz hand camera shown by the President, which provoked deserved admiration, was the Photo-stereo Binocular, which, usable as a first-class field glass, is transformable in "half a mo'" into either an opera glass, a stereoscopic camera, or an ordinary hand camera. The whole concern is carried in a sling case, and is in appearance and size almost identical with any ordinary race glass.

AINTREE PHOTOGRAPHIC SOCIETY.—At the meeting of this Society last week, one of the Vice-Presidents (MR. WILLIAM LOCKIER) gave a demonstration intended more especially for beginners, still one which was also very interesting to those who have had some experience. He had an assortment of cameras, and explained the whole of the working parts, in fact, demonstrated in a brief way the making of a negative and on to the finished print, pointing out how necessary it was for a beginner to know something about stand-camera work before undertaking the more difficult hand camera. The Ilford Company kindly sent a number of their *Every-day Book*, which so clearly shows what dangers await the unwary photographer, and explains how to avoid them. Messrs. Elliott & Son also sent some of their bi-monthly journals for distribution.

FORTHCOMING EXHIBITIONS.

1900.
May 23-25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.

July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on bo' th sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

GAUGES.

To the EDITORS.

GENTLEMEN,—It is surely to be greatly regretted that the British Committee of the Paris Photographic Congress should seek to oppose the efforts being made to establish a thorough understanding on the important matter of gauge of photographic plates.

Year by year photographic apparatus is becoming more elaborate as ingenious ideas are evolved, and the usefulness of these ideas depends largely upon the accuracy of the workmanship in making, finishing, and fitting the relative parts, so that, if the proposed resolutions of the plate-makers were to gain general approval, which I think highly improbable, a very serious discouragement would be offered to British inventors and apparatus-makers at a time when every reasonable effort should be made to free them from the trammels of obsolete ideas. Is not gauge the very keystone of American manufacture? Has not the foreigner come over to us with his magnificent uniformity in high-class goods? Contrary to the proposed resolutions, I hold: (1) That it is quite a mistake to cut plates less than the nominal size; (2) $4\frac{1}{4} \times 3\frac{1}{4}$ should not mean $4\frac{3}{16} \times 3\frac{3}{16}$ inches—there should be no difficulty in reducing the limit of error to one per cent.; (3) That a proper limit of thickness should be fixed, and prices adjusted accordingly; (4) That the custom and experience of the trade in the above matters have not been amply sufficient to satisfy all requirements.—I am, yours, &c.,

Wm. HUME.

1 Lothian street, Edinburgh, May 12, 1900.

THE JOLY PROCESS—A CORRECTION.

To the EDITORS.

GENTLEMEN,—I should esteem it a favour if you would make a correction with regard to my name, which appeared in your issue of May 4 as C. B. "Howdice," under the heading of "The Joly Process Practically Applied," it should have been C. B. Howdill; in every other particular the report was correct.

I expected your attention being drawn to the error or misprint by the reporter, hence my not writing last week.

I should be pleased to correspond with any amateur who is working the "Joly" process, as, up to now, I have not come across any one with whom to compare notes.—I am, yours, &c., CHARLES B. HOWDILL.

24, Albion-street, Leeds, May 14, 1900.

[We insert the correction with pleasure; will those of our readers working the Joly process take cognisance of the last paragraph in Mr. Howdill's letter?—Eds.]

THE STEINHEIL LENSES.

To the EDITORS.

GENTLEMEN,—In your issue of April 27 you inserted a note to the effect that Mr. Arthur Rayment was English agent for Messrs. Steinheil's famous lenses. We wish to point out that our firm have the sole British licence for these lenses.

The arrangement with Mr. Rayment was due to a misunderstanding. We beg to say, on Dr. Steinheil's authority, that it will be immediately cancelled.—We are, yours, &c., R. & J. BECK.

68, Cornhill, London, E.C., May 14, 1900.

[We understand that Mr. Rayment received his agency from the Paris house of Messrs. Steinheil. Both parties, no doubt, acted in perfect good faith in the matter.—Eds.]

COPYRIGHT.

To the EDITORS.

GENTLEMEN,—In your JOURNAL of May 11 I observe an article by "Free Lance," in which the writer states as follows:

"It is very satisfactory to know that the odious Copyright Bill has no chance of being passed this session. It is to be hoped that sufficient organized opposition may be brought into play against its next appearance that shall succeed in getting it rejected. Photographers should combine, and, above all, interview the local M.P.'s on the subject. So far as I can see, the effect of any effort of the Copyright Union has been absolutely nil."

It is very funny that "Free Lance," who writes about copyright matters, should be so ignorant of the present position of affairs. The "odious Copyright Bill," which, he says, "has no chance of being passed this session" is really defunct, and is replaced by another draft of the Bill, which has been read the second time in the House of Lords this session, and is now before a Committee of the House of Lords. This redrafted Bill is, in my opinion, eminently satisfactory. Photography is placed in the same class and enjoys the same rights as any other artistic work. The very production of a photograph secures a copyright; there is no registration required, and the duration of copyright is for the lifetime of the photographer and for thirty years after his death.

"Free Lance" says, "So far as I can see, the effect of any effort of the Copyright Union has been absolutely nil." I am not surprised that he should say so, for, if a man doesn't look, how can he be expected to see? If "Free Lance" would really take the trouble to look up all the facts about the Copyright Bills, I am convinced he will change his opinion, and say the Photographic Copyright Union has achieved a very great success.—I am, yours, &c.,

FRANK BISHOP.

London Chamber of Commerce, Botolph House, Eastcheap, May 15, 1900.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

J. Yeoman, Bedale, Yorkshire.—Photograph of a group o' cricketers.
Helli & Sons, 211, Regent-street, W.—Photograph of 1st M.R.E. for South Africa.
M. Senior, 6, Church-street, Inverness.—Photograph of Service Co. of Cameron Highlanders Volunteers.
A. Paterson, 32, Church-street, Inverness.—Photograph of Trooper P. H. Smart.
Photograph of Trooper D. Smart.
J. B. Scott, 18, Devonshire-street, Carlisle.—Photograph of group of H.R.H. Princess Victoria of Wales, Sir Richard and Lady Musgrave, Mr. Tom Musgrave and Master Courtney Musgrave. Photograph of H.R.H. Princess Victoria of Wales.

NELL.—1. The Photographic Copyright Union (Hon. Secretary, Henry Gower), London Chamber of Commerce, Botolph House, Eastcheap, E.C.
2. Yes.

WATER.—We had the water tried for washing gelatine negatives and prints, and the report we received was that it appeared to have "no harmful effect on the films."

COPYRIGHT.—A. Z. The copyright is undoubtedly yours; but, as you have not registered it, you can take no proceedings. If you register it, you may be able to prevent the further sale of the piracies.

AJAX.—The negative should be left in the solution until it assumes a deep brown colour, but all depends upon the extent to which it is required to intensify. The solution will keep well in a weak light.

DRYING ENAMEL QUICKLY.—R. HOLDEN asks the method of drying enamel quickly.—There is no better way than to place them where there is a dry and slightly warm atmosphere. Heat should not, of course, be used.

W. H. C.—Our recollection of the camera (which we do not think is now on the market) is that it was a good and practicable one. Probably you will not be far wrong in purchasing at the price named, but we cannot give a more definite opinion without seeing the actual instrument.

A. G. B.—We imagine that the application of your theory would only hold good in the case of both sides of the film—which are not of equal sensitivity—being subjected to the action of light, and admitting of reduction by development; but this would not be the case in actual practice.

ORTHOCROMATISING PLATES.—C. WARMAN writes: "Is there any method known of converting ordinary plates into isochromatic ones, as I often require one or two, and I do not want to buy a dozen every time?"—Yes. Formulae for doing it will be found on pages 1083-4 of the ALMANAC.

LESSONS IN X-RAY WORK.—NERROW writes: "Could you kindly inform me where I can obtain lessons in X-ray photography?"—In reply: We know of no special instructors in radiography, but, possibly, if our correspondent inquires of Isenthal, Potzler & Co., Mortimer-street, Cavendish-square, W., they may be able to meet his requirements.

HYP-ELIMINATOR.—HYPO writes thus: "Will you please tell me which is the best hypo-eliminator to use, as I have read of several, and I want to use the one that is *really* the best?"—The best hypo eliminator is water, pure and simple. If the negatives are thoroughly fixed in the first instance, the hypo is readily got rid of by the use of plenty of running water.

VARNISHING GLASS POSITIVE.—J. COLEMAN. If the glass positive has been made so many years, it will be somewhat risky to varnish it with a spirit varnish. Sometimes, in these old pictures, the collodion film has become altered in character, and quite soluble in strong spirit. If the picture is varnished at all, it should be done with a varnish in which benzole is the solvent.

F. L.—We are in doubt as to whether we can be of any assistance in such a case; but (1) we should think there would be no restriction as to the use of the symbol; (2) probably, if you sought to protect it as a trade mark; (3) we should think not if not so used, but your better plan will be to consult a trades-mark registration agent, as we are not quite sure of our ground in this matter.

RESTORING SPOILT ENGRAVINGS.—ENGRAVER writes: "A client of mine has brought me an engraving very much spotted with yellow damp spots, and wishes to know if it is possible to get rid of them. I shall be glad of the address of a firm (if there is such a one) that would restore the engraving."—In reply: We know of no such firm, but perhaps some reader will help our correspondent.

DISCOLOURED PYRO SOLUTION.—S. R. says: "I have made up two lots of ten per cent. solution of pyro with the usual quantity of sulphite, and both are of quite a sherry colour. What I have made before has been almost colourless. What is the cause?"—Probably the sulphite was not a good sample—been badly kept. Try the solution; it may possibly work all right at present.

BLACKENING THE EDGES OF LENSES.—T. BOWERS writes: "I have read several times that the edges of lenses should be blackened. I have an old portrait lens of rather a large size, the edges of which do not seem to ever have been blackened. Will you please tell me the best medium to use for the purpose?"—Nothing is better than the ordinary dead black varnish sold for photographic purposes.

PYROXYLINE.—N. JOSEPHS says: "I made some pyroxyline, or rather tried to do so—according to Hardwick's formula, but, after the cotton had been in the acid for a few minutes, it all dissolved. Can you kindly tell why it did so?"—Evidently the acids were not the full strength given in the formula, or too much water was added. Or it may be that the cotton was not thoroughly dry at the time of its immersion.

THE CHADWICK STEREOSCOPE.—WILLIAM DREW writes: "Will you please inform me where I can purchase the Chadwick stereoscope, or similar instrument, as recommended in the ALMANAC, also the best instrument for viewing transparent stereoscopic slides?"—In reply: The stereoscope referred to is the invention of Mr. W. I. Chadwick, 26, King-street, Manchester. It is adapted for viewing transparencies as well as slides.

COPYRIGHT.—IBEX writes: "Do you mind telling me how I stand with regard to the risk of copyright under the following circumstances? A customer sends me a photo to enlarge or copy. He paid for it in the ordinary way of business, but I see the mount has upon it the word 'Copyright.' Under what circumstances may I or may I not copy a photograph?"—In reply: If the photograph is registered at Stationers' Hall you run the risk of an action for infringement. In such cases an indemnity should be obtained from the customer, though it is seldom, if ever, done. Still, the law of the matter is as we have stated.

STUDENT.—Your best plan, perhaps, will be to address Dr. J. M. Eder, the Technical High School, Vienna, who will acquaint you with the terms for the photographic courses at that institution. Some years ago Mr. Leon Warnerke read at the Royal Photographic Society a paper descriptive of the establishments at Vienna, Berlin, Brussels, &c., at which photography can be studied. If you call at 66, Russell-square, W.C., you may be able to consult that paper in the library. As to the cost of living we can give no idea; but we believe a knowledge of English and French would carry you through so far as languages go in almost any part of the Continent.

MOISTURE ON LENS.—GEO. BETTS says: "The other day I had to photograph the interiors of three greenhouses, and on coming to focus—a wide-angle lens—I found I could hardly see the image. On examining the lens I found it covered with moisture. When I had wiped it off, I found that it came again, and also between the lenses. Finally I got the negatives, but they were anything but brilliant ones. Is there anything that I can put upon the lens to prevent the moisture in greenhouses from condensing on the glass?"—The condensation may be prevented from gathering upon the lens by simply making it slightly warmer than the atmosphere of the building—say by standing it close to the hot-water pipes for some time before it is used; then no condensation will take place.

IRON IN WATER.—T. SAUNDERS. If the water, after being drawn from the tap and allowed to stand for a few hours, deposits a yellowish-red precipitate, it looks as if it contains particles of iron in suspension. If that be the case, the spots on the prints are fully accounted for. The only way to avoid them is to filter the water. A flannel bag, filled with cotton wool, tied over the tap, will, to an extent, mitigate the evil. Probably the pipes, if of iron, are rusty on the inside.

RIGHT TO PHOTOGRAPH.—R. C. A. asks: "Can a rector legally prevent me from taking a photograph of the church? The other day I was about to do so, and the parson came out of the rectory and told me he would not allow it, although I was going to take the picture from the road—a highway. He told me he had given the sole right to photograph the church to a local man, who allowed a percentage of the prints to the schools."—The Rector cannot prevent you from photographing the church from the highway, and you were foolish to pay any heed to his "bluff," which was unworthy of a clergyman.

COMBINED TONING AND FIXING.—C. BEST writes: "Will you kindly give me your opinion on this point? Are prints toned in the usual combined bath, containing alum and lead, as permanent as those toned in the sulphocyanide bath and fixed afterwards? I find that the former is far less trouble and more economical, as it takes a great deal less gold, and that is an item in toning a number of prints."—We should certainly say no, unless it is ensured that the tones are obtained by gold, and gold only, and not by sulphur. As our correspondent says that a deal less gold is required for the combined bath, it seems that, in his case, sulphur is a prominent factor in his toning.

JAMES McCONNAN.—1. In *Platinotype*, by Sir W. de W. Abney and Mr. Lyonel Clarke, published by Sampson Low & Co., Fetter-lane, a special chapter is devoted to the subject. Mr. Clarke strongly recommends a matt paper and the following bath:—

STOCK SOLUTION.

Chloro-platinite of potassium 60 grains.
Distilled water up to 2 fluid ounces.

Toning bath: 1 drachm of stock solution, made up to water with 2 fluid ounces, to which is added 2 or 3 drops of nitric acid. 2. An uncommon occurrence nowadays. Alum would act as a preventive, but probably the temperature of your developing bath was too high. 3. Inquire of Messrs. A. & M. Zimmermann, St. Mary-at-Hill, E.C.

LANDLORD AND TENANT.—L. M. writes: "I am in a bit of a fix with a studio I rent here. It is a quarterly house, and it has been in such a disgraceful state that we cannot live there, and the studio itself is a ruin, being a puddle half the time. Several of my backgrounds and other things have been spoilt. Matters were so bad that I gave notice in March to leave in June, and now the landlord says I must stop till next March, being the same month that I entered the premises. Will you tell me if I really am liable, considering what a disgraceful wreck the place is? I may say that a builder was brought to see what he could do to the studio, but he refused to touch it, saying it could not be repaired."—In reply: Yes; as we understand the law of landlord and tenant, you are liable for the rent till next March. But an almost similar case came under our own observation recently, and legal advice was given to threaten an action for damage caused by the ingress of rain. It had the effect of causing the premises to be repaired.

SPOTS ON PRINTS.—SPOTS writes: "Can you tell me the cause of these spots, they have been a great nuisance to me for some little time, and I have tried to trace them, but do not feel satisfied? I always use same strength bath—1 drachm sulphocyanide, 16 ounces of water—and am as clean in working as one can possibly be. I sometimes mount at night, and one cannot possibly see these spots at night. I wrote the manufacturers but they could only tell me what I know already, that was, that there must be some foreign matter somewhere. I think myself that they are caused by the water, or else I use my alum bath too much. I should be much obliged if you could possibly help me, I see so much of what you do for others in your JOURNAL that I have felt encouraged to trespass on your kindness."—The cause of the spots is that indicated by the manufacturers, namely, foreign matter; but where it comes from it is impossible for us to say. It may be from the water, or it may be from other sources, such as dust, &c. If you suspect the alum, why not omit its use with a few batches of prints, and see the result? We should not think, however, that these spots are due to the alum, but there is no reason why it should not be omitted by way of experiment.

COPYRIGHT.—ALBION writes: "We have in our town two printers' stationers, &c., who are issuing post cards with views of the town printed on them. These views are printed from blocks made from our photographs, without our permission or ever mentioning the matter to us at all. Is this legal, and can we stop them from using these photographs, being from our original prints, or can we take legal proceedings of any kind? These pictures were not copyright or registered; they were bought for sale as either ordinary photographs or opalines, not to be reproduced. Some time ago we gave, for the benefit of an institute, some pictures to be reproduced as decorative pictures for an illustrated programme, to be used for no other purpose. We have an idea these blocks are being utilised for this post-card business; if so, is this legal? Can they stand by reproducing prints from our negatives at all without permission? If not, what can we claim as damages?"—In reply: If our correspondents took the original photographs, the copyright is theirs, and proceedings can be taken provided that registration has been effected at Stationers' Hall. The Copyright Act is printed in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900. We would suggest that our correspondents should consult a solicitor; it is not clear, according to the terms of their letter, if they really have copyright in the photographs.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

IN a sympathetic article on "Science for the Love of It," our contemporary, the *Scientific American*, makes the timely remark that it is because the work of the pure scientist is so self-sacrificing and unselfish that he commands our special regard. "With but little prospect of material advancement, he is content to labour long years for the sheer joy of adding something to the sum total of human knowledge. Not to mention that most conspicuous example of disinterested scientific research, Faraday, what adequate pecuniary reward has Tyndall derived from the arduous research that culminated in his brilliant theory that heat is a mode of motion? What personal advantage has accrued to Crookes and Lockyer in their endeavour to prove that the seventy odd elements known to chemists are but the modifications of one matter, even as our various forms of energy are but the manifestations of a single force? What commensurate reward have Darwin and Spencer received for their investigations in the theories of natural selection and evolution, or Röntgen for the discovery of the rays that should rightly bear his name?" Science very

rarely wins many of the material prizes of life; like virtue, it is its own reward. In our own branch of science, that which concerns itself with photography, there are many earnest workers who are, and have to be, content with contemporary acknowledgment and recognition as the sole return for their labours. And it will be an ill day for human progress when men of this kind will no longer be found amongst those whose principal aim in life is to add to the sum of our knowledge.

* * *

PROFESSOR FLINDERS PETRIE'S paper on "A National Repository for Science and Art," which was read at the Society of Arts on May 16, contained the very valuable suggestion that the nation's artistic and scientific treasures should be arranged in a plain and specially erected building to be located on suitable ground twenty miles or so out of London. In brief, the Professor would shut up the costly and inadequate museums in South Kensington and Bloomsbury, and would make his rurally situated range of cheaply constructed galleries the nucleus of a unique village to be called Sloane, which would become the Mecca of those seekers after knowledge whose pilgrim instincts would survive the expense and worry of a twenty-five mile journey on the London and South-Western Railway. It is plain to all that the National Museum accommodation is becoming, year by year, painfully taxed, and that in time to come the adoption of some such plan as that advocated by Professor Flinders Petrie will be lifted out of the region of mere platitude of opinion and become an absolute necessity.

* * *

ONE of the subjects dealt with by the Professor in his very thoughtful and reasonable paper related to the registration of the objects in a museum. By the present system, he remarked, the solemnity of registering every object, with drawings and full description, is said to need a costly staff. But, as he pointed out, we have learned to register the stars by the thousand photographically instead of registering each separately, and so, in his opinion, we must do for the contents of our store-house. A photographic register of groups could be done by cheap artisan labour, and very rapidly kept up. The use of photography for this purpose is a capital suggestion, no doubt, though we are unconvinced that "cheap artisan labour"

would be found satisfactory from a technical point of view. Museum photography demands a very high degree of skill indeed, as the distinguished Professor's experiences long ago very likely taught him. In a later reference to the subject, Professor Petrie also stipulates that the objects, and all information about them as to source, donor, &c., should be photographed on a fixed scale, in a special camera house, at the time they arrive. The cost of plates and labour to photograph double the annual exhibiting area would be under 50/- a year. This estimate strikes us as exceedingly low; at a venture we should hardly think that the photography of one year's additions to the London museums could be done for so small a sum as 50/-; however, these are minor points. What we are pleased to observe is that the Professor, in the scheme for his museum at Sloane, recognises that photography is capable of playing a valuable part. To repeat the concluding words of one of the most interesting papers recently read at the Society of Arts, "May we all meet twenty years hence at Sloane."

* * *

Mr. Punch, during the fifty-nine years of his merry existence, has poked fun many times at photographers and photography, but never in an unkind manner. In the last few years the gaiety of the nation has been added to by the issue of cheap reprints of the first fifty years' volumes of our contemporary, while Mr. Spielmann has written the great jester's history, and Mr. Holt Schooling, in the pages of the *Strand Magazine*, has given us a selection of *Punch* pictures, with explanatory notes, extending over a period of half a century. Now come the publishers, Messrs. Bradbury, Agnew, & Co., Ltd., of 10, Bouverie-street, E.C., who send us a volume of 200 pages, entitled *An Evening with "Punch,"* made up of random selections in prose, verse, and illustrations. The book is dedicated to the unfortunate man, woman, or child in whose home there is not a set of the *Punch* volumes. *Mr. Punch* is a national institution of which it is difficult to write too favourably, and we are happy to be the means of informing our circle of readers that this *Evening* with such a delightful companion may be had for the modest sum of two shillings and sixpence. It is a book which gives us a taste of the best English wit, humour, and pathos of fifty years.

* * *

WE have received from the well-known photographers, Messrs. John Patrick & Sons, of 52, Comiston-road, Edinburgh, a supplementary catalogue of their local views, about ninety of which are devoted to Edinburgh itself, while there are series illustrating the land of Burns, the Trossachs, and celebrated golfing links. Another series comprehends the homes and halting-places of the Carlysles, and yet another illustrates the early homes and haunts of the late Robert Louis Stevenson. The last-named author at the present time stands high in popular esteem, and there is apparently no limit to the enthusiasm of his admirers in collecting reminders which bear upon his short and busy life. Messrs. Patrick's Stevenson photographs are the outcome of great skill and assiduity, and they include a portrait of the deceased writer. The Carlyle series is also complete and interesting. This mention of Messrs. Patrick's catalogue may be useful to many readers who may desire to know the source from which photographic memorials of two great Scottish literary men may be obtained.

THE fourth of the series of One-man Exhibitions in the rooms of the Royal Photographic Society, 66, Russell-square, W.C., will be opened at eight o'clock on Tuesday evening next, May 29, by Dr. P. H. Emerson, who will deliver an address. About 140 photographs will be shown, and they have been specially framed for the purpose. Presumably this Exhibition, which remains open till the end of June, will complete the series until next autumn, when, no doubt, the One-man Exhibitions will be continued. They have been very popular features at Russell-square this spring. Previous contributors were Mr. Craig Annan, Sir J. Benjamin Stone and the National Photographic Record Association, and Mr. F. H. Evans, whose Exhibition closes this week. Admission to these exhibitions is free, a card being easily obtainable from the officials of the Society or a member.

* * *

WE are indebted to an American contemporary for the report of a case which is interesting from the fact that the United States Judges sustained a photographer's contention that, when negatives are injured or destroyed by carriers and though the negatives were neither good nor valuable, damages may be recoverable. It appears that the plaintiff, who was a passenger upon the steamship *Alleghany*, of the Atlas Steamship Company, plying between South America, the West Indies, and the port of New York, took on board a box of photographic negatives and views in the harbour of Port Limon, and gave them in charge of one of the cabin stewards. The box was an old brandy case, which the plaintiff had utilised as a receptacle for his negatives. He had also with the box of negatives three demijohns of mineral water. When the vessel arrived, neither the box nor the demijohns could be found, and the Lieutenant left the wharf without them. The next day he learned that the demijohns had been found, but not the box. He went several times to the wharf during the following three weeks, and was always told that the box was missing. It was found, however, in a locker in the forepeak of the ship some months after Mr. William E. Wamsley, as assignee, began suit for its loss. Four or five boxes of signals had been moved to the locker. They were old cases, similar in shape to the box of negatives. The chief officer, who had directed them to be put there, ordered one of the boxes of signals to be brought up to him on the bridge. On being opened, this box turned out to be the one containing Lieutenant Massey's negatives. A dismissal of the complaint on the first trial was reversed by the Appellate Division upon the ground that sufficient had been shown to require submission to the jury of the question whether the Company had converted the box of photographs, or whether its excuse for not delivering it upon Lieutenant Massey's demand was a sufficient one. A judgment for the plaintiff on the second trial for a substantial sum as damages was lately affirmed by the Appellate Division of the New York Supreme Court, in an opinion by Justice Rumsey. The Court held that, though these articles had no market value, the plaintiff was entitled to recover as damages for their conversion their actual value to him. Though the fact that the negatives were not good ones was to be considered, the jury might also consider that, "when one has gone a long way to obtain photographs of the scenery of a foreign land which is difficult to reach, or where the photograph is of some incident which is not likely to be repeated, even a poor representation may be of considerable value if a picture can be printed from it, because, as far as it goes, it is a correct

presentation of what occurred." Given a set of similar circumstances in this country, we doubt whether a photographer could recover damages for what were virtually admitted to be indifferent negatives, especially in view of the fact that the plaintiff obviously treated them as such!

IMPURE PHOTOGRAPHIC MOUNTS.

NEXT the article in our issue of a fortnight ago, a correspondent asks the following question, "Why does not some enterprising firm put upon the market mounts that are guaranteed to be pure, and such as will have no evil effect on the pictures mounted upon them?" There may be several answers to this question. One is, that mounts put upon the market with such a guarantee would necessarily be much higher in price than the usual commercial articles, and the question naturally arises as to whether amateurs, and we may include many professionals, would pay the necessarily enhanced price for that guarantee? We venture to say that we doubt if any firm who put such mounts upon the market would find the idea a commercial success. We, a few years ago, consulted one of the oldest and most renowned firms of card-board makers in this country on this very subject, and this, in substance, was the reply: We used to make a speciality of photographic mounts that could be depended upon, but foreign houses came into the market with showy goods at much lower prices, so we let this branch of the business drop. We still make the boards, and cut them up to photographic sizes, but we do not catalogue them as "photographic mounts."

Now, the question arises, Do amateurs as a rule, and some professionals, really care "two straws" about the permanence of their pictures? We are induced to put this query from the number of letters we are continually receiving from correspondents, sending stained and fading prints, asking if the mounts are the cause of the deterioration. One would almost have thought, after all the simple methods of testing the suitability of mounts for photographic purposes which have appeared in the JOURNAL during the past few years, that all photographers who take any interest in the stability of their work would have tested their mounts before taking them into use, because the trouble is so trifling. That being the case, it is very doubtful if they would pay an increased price to secure mounts that would be guaranteed inert on silver prints mounted upon them.

There is another point in connexion with this matter that may weigh with mount-makers. It is this: A mount may be perfectly pure, and yet a silver print mounted upon it will fade, though that may not be due in any way to the mount, but to the imperfect fixation and washing of the picture. This, of course, might lead to litigation between the manufacturer and the purchasers, with the usual *pro* and *con* evidence of experts and the expenses following. With these facts before us, it is not to be surprised at that no enterprising manufacturers do put upon the market photographic mounts of guaranteed purity. However, the photographer who values his reputation can, if he will take the trouble, easily test his mounts and thus prove their quality before using them.

In connexion with the above-mentioned article, and the methods for testing the purity of photographic mounts, a correspondent calls our attention to the fact that, if many of the chocolate and other coloured mounts were submitted to Mr. Foxlee's test, they would show a discolouration in a day or so.

That is quite true. But it is simply a colour stain on the prints, and it need not in any way impair the stability of the photograph itself. When Mr. Foxlee described his method of testing photographic mounts before the Photographic Club some years ago, we remember that he showed some examples in which the coloured mounts had stained the picture within a few hours, yet, after the lapse of some weeks, the image remained intact. This could be seen by viewing the picture by transmitted light, though it was almost obliterated by the stain when seen by reflected light. The colouring matter on a surfaced mount, though it may stain the paper, may be quite inert on the permanence of the silver image itself. Sometimes this colour is so soluble that, if the picture is made very wet in the mounting, it will come through the paper and produce a stain on its surface, which is seen at once. The method is to detect latent causes of the deterioration of silver prints by the use of unsuitable mounts.

A new Storage Battery.—That the capabilities of electricity are not sufficiently realised in photographic practice is in all probability due to one of two causes: either the initial outlay for a complete electric installation is not justified by business expectations, or the experience with accumulators is unsatisfactory. There are, however, numerous minor uses for electricity, if a ready means of generating it were available. Every one is familiar with the electric bell, which an average schoolboy could erect at an expenditure of less than a sovereign; but when it becomes a question of dark-room lights, fixed or portable, difficulties arise. An accumulator is beautifully simple in theory: you have your battery, make your connexions, turn on the tap as it were, and the light appears. There is, however, an unfortunate "but." An accumulator quickly spoils if not kept regularly charged, the plates buckle, the battery short-circuits, and expense is quickly entailed. There are, it is true, several dry batteries in the market, that are capable of regeneration when exhausted by passing the current the reverse way through them, and there are many small portable accumulators, capable of working for from five to twenty-five hours, but they have not had much vogue amongst photographers. We note, however, in the *Scientific American* particulars of a new form of accumulator, which if the claims made for it should prove to be just, should make the use of electricity a very simple thing in any studio. It is claimed for this battery (made by the United States Battery Co.) that it can be kept in stock by dealers fully charged, and that it will not deteriorate by keeping. It is by no means heavy, the positive element in a five-ampère hour cell weighing only six ounces, while the whole battery of positive and negative elements charged with the suitable liquid only weighs seventeen ounces. It is further stated that it can be recharged by passing the current through it in a shorter time than with most others. Finally, it is stated to have a discharge of 2·65 volts, a record power.

Solar Eclipse Duration.—The length of time during which a solar eclipse remains visible depends upon a variety of conditions, which *Nature* last week tabulates on the authority of Mr. C. Whitmell (President of the Leeds Astronomical Society). Five conditions are given under which the duration is extended, but two of them cannot be fulfilled, the most important being that the observations be made from a station on the equator, the linear velocity of the observer then being greatest, besides having the sun in the zenith, and so giving an umbra as large as possible. *Nature* states that Mr. Whitmell gives, on the authority of Mr. Crommelin, who calculated them from Oppolzer's data, six long-duration eclipses during the next century, the longest being "7 hours 24·5 minutes." This is, no doubt, a misprint for minutes and seconds. Over the signature of Charles P. Butler will be found, in the same number of that periodical, a detailed account of the expeditions that are being sent out by various observatories, and the work they have arranged to carry

on. We note that the kinematograph to be worked by Mr. and Mrs. Maskelyne will be provided with a tele-photographic lens. Professor Campbell, from the Lick Observatory, will use an instrument of forty feet focus, and thus obtain a direct image of the sun four inches in diameter. Amongst other novelties, a kite will be sent up by Mr. Bacon to observe the temperature, and compare it with that at the ground level. A tele-photo arrangement will be used by Mr. Dyson at Ovar, the positive lens being the nine-inch refractor of the Thompson photo-heliograph at Greenwich. At Tripoli a most ingenious system of electrical exposures is to be worked by Mr. Percevall Lowell, of Arizona, and Professor Todd, of Amhurst College Observatory, U.S.A. A great number of photographic cameras will be automatically exposed for varying times, all of them being operated from one revolving drum with delicately fitted electrical contacts.

Photography and Art.—Photography has done much in instructing painters in many ways. It has given them many hints with regard to the movements of animals, and enabled them to depict them according to their correct attitudes while in motion; also with regard to the human figure divine. There is, however, a type of "artists" to which it has not yet appealed: we allude to those who draw for the fashion papers. They still seem to ignore alike anatomy and drawing, as they have done for generations past. If one takes up a fashion plate, one cannot but feel amused at the grotesque drawing of the figures—all angles, and the proportions ridiculous. A member of our household recently called our attention to an illustration in a weekly paper that has a column devoted to the latest fashions which bears out our remarks. It was supposed to depict a female figure clothed in a tight-fitting costume, but how the arms could possibly have got into the sleeves of the dress, unless it was sewn upon them, it is difficult to conceive, and, if that were done, it is a mystery how they could possibly be bent without bursting the fabric. The figure was posed full front, with the usual "artistic" angles of the lay figure, and the most noticeable feature in the drawing was that the arm, when measured with a pair of fine compasses, midway between the elbow and the shoulder, was just a trifle larger than the waist. Other proportions, according to the *Venus de Medicis*, were equally ridiculous, if not more so. We have often wondered that the fashion papers do not illustrate them with direct photographs—process blocks are cheap enough—so as to give their readers a fairly correct idea of what is meant. At fashionable costumiers' there are usually attendants with good figures, in flesh and blood, upon whom a mantle or other garment can be shown to its best advantage, and why should not similar *life* figures be depicted in the fashion journals? They, one would surmise, would appeal more directly to their readers than the ridiculous lay-figure impossible attitudes and proportions that now appear in them.

A Photographic Risk.—Photographers, at times, run great risks in the pursuit of their art, as is well known. Last week a new one cropped up in the Divorce Court of quite a social character. It was this: It was stated in Court that the respondent had taken to amateur photography, and was in the habit of taking a lady into the dark room with him. To this the petitioner objected, and it brought about a serious quarrel. Not much evidence was reported on this point, but it was sufficient for one of the evening papers to head its report, "Dark-room Divorce Suit." We allude to this case simply to point out the trouble that a gentleman may get himself into if he gives instruction in photography to a lady friend and he happens to have a jealous wife. Professional photographers run a similar risk if they give instruction to lady pupils, as they frequently have to do in the course of business, and so do the sellers of photographic apparatus, who give practical instruction in its use. Of course, it is impossible to teach a pupil photography without the instructor and the learner being shut up together in the dark room.

The Royal Academy and the Tailors.—Our contemporary, the *Tailor and Cutter*, has paid a visit to the Royal

Academy Exhibition this year again, and, as usual, takes the exhibitors severely to task for not knowing how to do justice to the tailor's art. It complains that the artists do not paint the garments in a proper way, &c. It is to be hoped that the R.A.'s and A.R.A. and other artists will in future profit by the criticisms of our sartorial contemporary, and duly study the dummies to be seen in every clothier's window, so as to learn how the different garments should be represented in a picture. At present they too often represent them as comfortable every-day raiments such as people generally wear, and this does not by any means accord with the ideas of the *Tailor and Cutter*, hence its condemnation. If the artists would only study the aforesaid dummies, they might possibly be able to paint coats, vests, and trousers so as not to entail the censure of "sartorial artists," but we fear that they are obdurate in the matter. Perhaps the advice we have proffered to painters might also be extended to photographers; they, too, often do not arrange the dresses in strict accordance with the notions of those who made it.

"THE BRITISH JOURNAL OF PHOTOGRAPHY" WAR FUND.

THIS week we have to acknowledge the receipt of a further sum of 51l. 5s. to be handed over to the *Daily Telegraph* War Fund; but though gratifyingly large, by far too great a proportion of the total amount is traceable to one source. We should be very pleased indeed to see the Fund more numerously supported, and, as we said a fortnight ago, will welcome small as well as large amounts. So far the sums contributed range from 50l. down to 4s., and they proceed from representative sources. The *Daily Telegraph* Fund, large as it is, will require to reach to more than double its present amount in order that the claims that have been made upon it may be met; so that the scope for further help in the matter is only too wide. Again we say that the photographic industry and profession has benefited largely by the war, and it is peculiarly appropriate that, as a class, they should do something to help those whose loss has resulted in their gain.

In sending us the very handsome sum of 50l. for the Fund, Mr. J. J. Elliott, of the eminent firm of Elliott & Fry, 55 and 56, Baker-street, W., writes as follows: "I am glad you have started a fund for the benefit of the widows and orphans of soldiers killed in the war, and, as a photographer who has benefited pecuniarily by the war, I have pleasure in forwarding you, enclosed, my cheque for 50l."

Mr. Henry M. Ward, Trade Photographer, of 41, Belgrave-avenue, Leicester, writes: "Herewith I beg to enclose my mite for your excellent War Fund. Judging from my own experience lately, photographers have been well patronised by officers and men 'ordered south,' and should welcome this opportunity of showing what photographers as a body can do."

Mr. T. Stokoe, Photographer, of Clare, Suffolk, writes: "Though I have subscribed to numerous war funds, I should like to have a little share in *our own*, and send P.O. 4s. for that purpose."

The following is the list of subscriptions to date:—

Received last week and acknowledged in the *Daily Telegraph* of Friday, May 18:—

Messrs. J. H. Dallmeyer, Limited.....	£10	10	0
Mr. H. Walter Barnett	10	10	0
Proprietors of THE BRITISH JOURNAL OF PHOTO-			
GRAPHY	10	10	0
Mr. T. R. Dallmeyer, F.R.A.S.	5	5	0
Employee's of Mr. H. Walter Barnett	3	0	0
			£39 15 0

Received this week:—

Messrs. Elliott & Fry, 55, Baker-street, W.	50	0	0
Mr. Henry M. Ward, Trade Photographer, 41, Belgrave-avenue, Leicester	1	1	0
Mr. T. Stokoe, Photographer, Clare, Suffolk	4	0	
			Total £91 0 0

We thank those gentlemen who have come to our aid this week. An acknowledgment of their contributions appears in the *Daily Telegraph* to-day.

Cheques, postal orders, &c., that are sent to us should be crossed and made payable to "The Editor, BRITISH JOURNAL OF PHOTOGRAPHY."

MAGNALIUM.

WGLANDER & SON, the well-known opticians of Brunswick, have just issued a new portrait lens with a working aperture of $f\cdot2\cdot3$, which was originally calculated by Professor Zincke (*genannt Sommer*), but which has been altered by Dr. Hans Hartig. Another novel point about this lens is that it is mounted in a new alloy called magnalium, which has been discovered by Dr. Ludwig Mach, consisting of magnesium and aluminium.

The idea of utilising these two metals as an alloy is by no means new, having been suggested, according to Dr. Harting, in a paper read before the Photographic Society of Vienna, by Wöhler, over forty years ago. The first mixture was in the proportion of the equivalent weights 28 : 12, and was a tin white, extremely brittle mass, which, when heated to redness, burnt with a white flame like magnesium. The second alloy contained eighty per cent. of magnesium and twenty per cent. of aluminium, and was a half-ductile mass which had the peculiar property of falling to thin leaves without the evolution of hydrogen when left in water for a day. In 1870, Parkinson, after a long series of experiments, came to the conclusion that magnesium-aluminium alloys would be of no value in the arts, and Richards, in his work on "Aluminium" (1890), appears to look unfavourably upon such alloys.

According to Mach's experiments, the failure of all these alloys was due to the presence of impurities such as sodium, carbonic acid, and nitrogen, and the presence of these substances produced the ready destruction by water, whilst Mach's magnalium is absolutely stable in air and water. As long as aluminium was prepared by the reduction of its salts by sodium it was not possible to avoid these impurities; but, now that magnesium is prepared by electrolysis, absolute purity is possible. Magnalium is a silver white metal, unaffected by air and water, and it can withstands oxygen acids, such as sulphuric acid, to a great extent, but alkalies attack it. Its specific gravity is less than that of aluminium, which is 2·7, whilst that of magnesium is 1·7, so that the alloys range from 2 to 2·2, according to the proportions of the metals. It is therefore about twice as heavy as water. The melting point lies between 600° and 700° C., according to the proportion of magnesium.

As regards the value of the alloy in the arts, this differs enormously, according to the proportion of magnesium. Pure aluminium, like copper, and silver, is extremely unpleasant to work; on the other hand, brass, steel, or nickel silver work up well and they never "strip." Aluminium does, a fact which is known to all who have used lenses mounted in brass and aluminium. The metal which works best is brass, and anything which is to replace it must be as like it as possible, and alloys of aluminium, zinc, and copper have been tried, but their specific gravity is comparatively great, so that they have been but little used. By the addition of magnesium, aluminium gains considerably in hardness, and the alloy can be rolled in sheets or drawn into wire; 100 parts by weight of aluminium and 10 parts by weight of magnesium give the working qualities of rolled zinc, with 15 parts of magnesium, or of cast brass, with 20 parts that of soft copper, and with 25 parts of hard copper. The actual metal used contains from 10 to 15 parts of magnesium to 100 of aluminium; it works well and is free from rippling or softness, the surfaces are smooth and even, and the small screw threads may be cut with the greatest fineness, and it is so hard that a piece of sheet aluminium can be cut with a magnalium knife.

Although the experiments have not yet been finished, it is believed that by admixture with other metals the alloy may be made to have a greater hardness than cast iron, with a fracture like steel.

A mixture of 100 parts by weight of aluminium and 30 parts of magnesium is very hard, and for working this is the extreme limit. If we add more magnesium, however, it becomes more brittle, but gains considerably in its capability of being polished, till it reaches its maximum in this respect when the metals are mixed in the proportion of their atomic weights, or as 24:27, but the limits between which the alloy will polish well are 2 parts of aluminium and 1 part of magnesium, and 1 part of aluminium and 4 parts of magnesium.

The reflective power is very high, about that of silver, and far above that of other speculum compositions, all of which especially absorb the ultra-violet part of the spectrum, and for which reason glass mirrors are preferred, but even these must be considered inferior to magnalium mirrors, which reflect almost without any absorption. As is well known, all speculum alloys are very heavy, having a specific gravity of from 7 to 8·5, they are, therefore, about three times as heavy as glass, whereas magnalium is lighter than glass; it is also less liable to flexure, and therefore has no ill effect on the image. As regards price, it is, bulk for bulk, the same price as brass in the raw state, but it is rather more costly to work.

A PHOSPHATE OF SILVER COLLODION PAPER.

In the current number of the *Photographische Correspondenz* Professor Valenta describes his experiments with phosphate of silver, and says that in 1839 Fife* described a method of preparing a photographic paper with phosphate of silver. He treated paper with solution of phosphate of soda and silvered it after drying in a silver bath, or painted over the paper a solution of silver nitrate in ammonia or ammonium carbonate solution. This process, however, found no practical use, nor did a somewhat similar process, published by Maxwell Lyte,† which was used with albumen paper. Conduchee‡ stated that the prints thus prepared showed fog in the shadows. Later, Lyte§ treated paper with a solution of sodium phosphate, Rochelle salts, sugar of milk, gelatine, and water, and silvered it after drying. He stated also that there was no insoluble silver precipitate formed as when a chloride was used to salt the paper.

Quite recently Dr. J. Meyer,|| of New York, has again directed attention to the phosphate of silver printing process by utilising the solubility of phosphate of silver in organic acid, such as tartaric and citric acid, and has thus formed a gelatinous solution of silver phosphate, which solution is spread on the surface to be sensitised. On paper thus prepared vigorous prints can be obtained, which are readily toned with gold, and also without gold toning, and merely washing and fixing give brown tones on pleasing shade.

The experiments made by Valenta with Meyer's process on Rives paper, unprepared and also sized with arrowroot, gave similar results as were obtained on Arndt & Troost's sepia printing paper, which is prepared with ammonio-citrate of iron, tartaric acid, silver nitrate, and some gelatine.¶

Paper prepared according to Meyer's process is rather insensitive, and, when tested with a Vogel photometer and albumen paper as the standard, was found to be less than one-third the sensitiveness of ordinary albumenised paper.

The phosphate paper showed, however, a very short scale of gradation, whilst the albumenised paper showed about two and a half times as much, and ordinary collodion paper about double.

The paper prepared according to Meyer's process appears, therefore, hardly likely to replace the normal papers, and experiments were made to modify it by adding gum and starch to the acid phosphate solution, but without the wished-for results.

Further experiments were then made in the direction of replacing the silver chloride by silver phosphate in the ordinary emulsion process with astonishing success; and a paper was thus prepared which excelled the best commercial collodion paper in sensitiveness, and also gave vigorous prints which were easily and evenly toned in the ordinary gold bath, and which, without gold toning, also gave beautiful sepia to black prints.

When using the silver phosphate with citric acid or silver citrate in collodion emulsion and keeping the proportion of citric acid low, or an emulsion is used without citric acid, the colour of the prints without gold toning is black, and the colour becomes browner the higher the proportion of citric acid.

With these emulsions the organic acids, as in the case of citric acid in the chloro-citrate emulsion, give greater brilliancy and clearness to the pictures, but lower the sensitiveness, which latter circumstance in this case is of no importance, because even a tolerably high proportion of citric acid does not so far lower the sensitiveness that it does not exceed that of the most sensitive commercial collodion paper.

For preparing a silver phosphate emulsion of this kind, place in a bottle 1500 c. c. of a four per cent. collodion with from 250 to 300 c. c. of ether, and to this solution add from 20 to 25 c. c. of phosphoric acid of specific gravity 1·265 at 15° C., corresponding to a proportion of forty per cent. of H_3PO_4 , to this then add from 50 to 60 grammes of citric acid dissolved in 100 c. c. of absolute alcohol. Now dissolve from 70 to 75 grammes of silver nitrate in 75 to 80 c. c. of water, and add 150 c. c. of alcohol. The silver solution thus obtained is added in the dark room by yellow light to the collodion, the bottle being vigorously shaken all the time.

The phosphoric acid combines with the silver nitrate, and the silver phosphate formed is suspended in the collodion, and forms a yellow emulsion, which contains, besides phosphate of silver, citrate of silver.

* Eder, *Handbuch der Photographie*, vol. iv., 1899, p. 3, from *Edin. New Philos. Journ.*, 1839, p. 144.

† *Journ. Photo Soc.*, vol. iii. p. 50.

‡ *Kreutzer Jahresbericht*, 1853, p. 27.

§ *Ibid.*, 1857, p. 57.

|| THE BRITISH JOURNAL OF PHOTOGRAPHY, 1899, p. 714

¶ *Ibid.*, 1895, p. 541.

order to make the nitric acid set free harmless,* from four to eight grammes of finely powdered lithium carbonate should be added to the emulsion, and the whole well shaken till there is no longer an evolution of carbonic acid gas. Then there should be added 20 c. c. of a solution of equal parts of glycerine and alcohol, and the emulsion filtered through cotton-wool.

The coating of paper with this emulsion can be effected as easily and regularly as with any good collodio-chloride of silver emulsion, and a printing-out paper is obtained which has, according to the kind of baryta paper used, either a glossy or matt surface.

This paper is about three or four times as sensitive as the best commercial collodion papers, and therefore it should be placed in the printing frame, and the toning, washing, &c., of the prints should be effected by yellow light, and not by diffused daylight.

The silver phosphate collodion paper requires somewhat dense and plucky negatives, and must be deeply printed. The prints have a dark brownish-black colour, and can, after washing in soft water, be easily toned in the usual toning baths.

The toned prints are very similar to the ordinary collodion prints, and sepia-brown to blue-black tones may be obtained as with albumen prints.

For toning, an ordinary borax gold bath is recommended, consisting of water, 1000 parts; borax, 10 parts; chloride of gold solution (one per cent.), 50 parts. Still, any other gold bath can be used. With the borax bath brown to purple-brown tones can be obtained, whilst sulphocyanide baths give bluish tones.

A sulphocyanide bath which tones very quickly and regularly consists of water, 500 parts; ammonium sulphocyanide, 10 parts; sodium hyposulphite, $1\frac{1}{2}$ parts. For use, 100 parts of this should be mixed with 100 parts of water, 20 parts of one per cent. solution of chloride of gold.

After toning, the prints should be washed and fixed in a ten per cent. solution of sodium hyposulphite, and then treated exactly like ordinary collodion paper.

If it is desired to work without gold toning, the prints should be washed in soft water, then laid in a two and a half per cent. solution of citric or tartaric acid till the yellow colour has quite disappeared and the silver phosphate is dissolved, they should then be well washed and fixed in a five per cent. solution of hypo and then well washed. The colour of the prints thus obtained is a beautiful deep brown.

Although this paper prints very quickly, it may be developed, when only faintly printed with aqueous solution of pyrocatechin or hydroquinone which contains a little citric acid, and the results obtained are quite equal to those obtained in this way with the ordinary papers.

PHOTOGRAPHY ON WOOD BLOCKS.

[Translated from the *Photographische Correspondenz*.]

For preparing photographic pictures on wood blocks instead of drawings, the wood block is usually prepared with a white ground, and on this, by a suitable printing process, the picture printed. Another way, which, under certain conditions, gives extraordinarily exact and beautiful results, is that in which, on a black ground, a thin collodion skin is transferred, this collodion being prepared by the wet-collodion process in the usual way on glass, and thence stripped by sulphuric or hydrofluoric acid, and transferred to the black surface.† In this way pictures similar to the well-known ferrotypes are obtained.

The black film is rather troublesome to the wood-engraver, as it presents some resistance to the graver. On the other hand, the transfer of the picture, as described in the directions, may easily cause trouble, as it is not easy, and also gives rise to distorted pictures; and it only succeeds with a somewhat stout film, which, again, makes the work difficult for the engraver, and prejudices the clearness of the picture.

As a help for the first trouble, I have found a very simple means. This is nothing more nor less than colouring the surface of the wood block with aniline black. To effect this colouring, the surface of the wood block is painted several times with a concentrated solution of aniline sulphate, and, when dry, is oxidised into aniline black by treatment with a solution of potassium bichromate containing cupric chloride.

In this way an intense black is obtained with matt shiny surface, which affords an excellent ground for the collodion negative image.

* An obvious alternative plan would be to precipitate carbonate of silver from the given quantity of nitrate, collect and wash the same, and then add this to the phosphate collodion. This would certainly obviate the presence of lithium nitrate, which probably has no good effect, and might crystallise out.—EDITORS.

† M. V. Roux, *Manuel de Calcoigraphie*; Lainer, *Photoxylographie*, p. 42; and *Traité de Photographie Industrielle*, by Féry and Burais, Paris, 1896, p. 326.

The wood surface, thus coloured, is freed from excess of bichromate solution by rubbing with a wet pad, and when dry is well rubbed with a flannel coated with solution of gum, and allowed to dry. It is thus prepared to receive the collodion film.

The picture is prepared in the camera by the wet-collodion process in the usual way on a well-cleaned sheet of glass, which should be rubbed with a benzine and wax solution.

The exposure should be full, the development short, and then fixed with potassium cyanide, then reduced with iodo-cyanide solution till the shadows are clear glass and a sufficiently thin image obtained. The iodo-cyanide solution is made by adding to a four per cent. solution of potassium cyanide a few drops of solution of iodine in potassium iodide. The plate should be then washed, allowed to dry, and then placed in a three per cent. solution of sulphuric acid, wherein it should be left till the film begins to strip from the glass. Then the plate should be taken from the solution, the film cut round the edges, a sheet of well-sized, smooth paper squeegeed on to it, and the picture and the paper carefully lifted from the glass and then transferred to the damp wood block by squeegeeing it on to the black surface and lifting off the paper. The result is a vigorous positive, with bright lights and beautiful half-tones.

Instead of gumming the wood block, the surface may, just before the transfer of the picture, be coated with aqueous shellac varnish, and the picture transferred before the varnish has dried in.

E. VALENTA.

DAGUERRE, TALBOT, AND NIÉPCE AT AN AMERICAN PHOTOGRAPHIC SALON.

OUR contemporary, the *Photo-American*, has lately published various amusing satires at the expense of some of the American photographic salons and their principal supporters, and in its last number laid the scene of the following midnight drama in the gallery of the Chicago Photographic Salon of 1900, in the course of which the three fathers of photography are made to disown some modern outcomes of their labours:—

(Enter three shades: the first of Daguerre, the next of Niépce, and the third of Fox Talbot.)

Daguerre: Well, gentlemen, we're in the wrong pew. Go back to the door, Fox, and ask that fellow where the photographs are.

(Exit Fox Talbot, while the others look around the room out of curiosity.)

Niépce: Pardon, bard, but how do ze dink zese pictures war made, and what are ze of?

Daguerre: Drop your English until Fox comes back. (In French): This thing here was evidently made by a painter who didn't know anything about painting. It's a regular daub. There isn't a good thing in it. The most of them are just as bad. In France we wouldn't have hung such paintings for a moment in our day. As to what they are pictures of, I should say from the colours that some of them are Chinamen; these, I mean, with the yellow faces. Some of them are Indians, a purely American race, which you have never seen; and these with the brown faces are half-breed negroes—mulattoes, they call them in this country. In fact, most of them seem to be of this latter class. They haven't any Europeans in the lot.

(Enter the shade of Fox Talbot on the run.)

Talbot: The man at the gate says this is the photographic exhibition we came to see. They don't call it that; they call it a Salon. That sounds French, and you fellows ought to know what it is. He gave me a catalogue. Here it is.

Daguerre: These photographs?

Niépce: This a Salon?

Daguerre: Well, I'm glad that it's pretty well settled now that I didn't discover photography. Niépce, it's up to you. Johnny Tennant says that you discovered it.

Niépce: He don't know what he's talking about. You discovered it yourself. There are half a dozen monuments to you all over the world. You can't put it on me.

Daguerre: Well, I didn't do it. Talbot must have done it. I didn't believe those articles in *Photogram* and the *Photographic Times*, but I'm beginning to believe them now. Talbot, you're to blame for this.

Talbot: May I never eat another shade of a saddle of Southdown if I did. Daguerre, you are to blame for this. One of the first things you ever said was that you were going to discover photography in colours, and now you've done it.

Daguerre: But I haven't. These aren't colours, they are smears. No man, woman, or child ever had such a colour as this thing (pointing to one of Litsig's masterpieces).

(Talbot has meanwhile picked up a magazine, April *Camera Notes*, from which he reads all about the process of local development, and proceeds to translate the same in French to the others.)

Daguerre and Niépce (in chorus): And they call that photography?

Talbot: They do; but I don't. And I move that we make a formal protest against it.

Daguerre and Niépce: We will.

(The three shades get their heads together and produce the following document, which they duly sign and seal):—

STATEMENT.

We, the undersigned, the discoverers of photography, hereby certify that we have examined the within collection of so-called photographs, and that we never discovered or intended to discover any such thing.

While we are always glad to see discoveries made in connexion with photography which will assist in the ease and certainty of results, and feel that, if intelligent efforts are made in that direction, photography will, in the course of time, become an independent one of the fine arts, and the means of the fullest expression of all that is artistic in the worker, we do not feel that any efforts are for the real good of photography which make it in any way subservient to a sister art, like that of painting, and which require the methods, skill, and training of the painter to produce desired results in colour or tone.

We think that the man who paints with a brush, be his medium pigment or a chemical, is a painter, and not a photographer. And we think that a picture, the lines and shades of which are produced by the application of a brush charged with either a chemical or a pigment, is a painting or drawing, and not a photograph.

We think, moreover, and finally, that every effort which makes the latent photographic image merely subsidiary to the exercise of talents apart and aside from pure photography, and clearly within the domain of a sister art, is an effort in the wrong direction, and destructive of the status of photography as an independent art.

[Signed]

DAGUERRE,
NIÉPCE,
TALBOT.

The shades affix this statement to the walls of the galleries and sadly depart.

Curtain falls.

RECENT PATENTS IN COLOUR PHOTOGRAPHY.

THORPE'S METHOD.

[Patent No. 11,466 of 1899.]

We print Mr. Thorpe's specification in full:

When transparencies of photographs taken separately through red, green, and blue-violet screens on isochromatic plates are viewed by transmitted light in such a way that the three photographs appear superposed and only the respective colour of each is transmitted to the eye, a picture of the object is seen in its natural colours as for example in the apparatus known as the kromscop.

For the purpose of transmitting only the respective colour of each of the transparencies to the eye, it has been proposed to impress by means of photography diffraction gratings of different spacing for each colour upon the respective transparency, and illuminate them in combination with a lens by parallel rays of light directed upon them from one direction, the different spacing for each colour displacing the spectrum formed by the respective diffraction grating to a different extent so that the spectra overlap, and, if the eye is placed at a point where the red of the spectrum from the transparency taken through the red screen, the green of the spectrum from the transparency taken through the green screen, and the blue of the spectrum from the transparency taken through the blue screen coincide, the photographed object will appear in its natural colours.

My improvements in the method of and means for rendering photographic and other pictures visible in their natural or other colours, consist chiefly in producing diffraction transparencies from isochromatic photographic transparencies, said diffraction transparencies having gratings of the same spacing for all colours, but the lines of the grating placed at a different angle for each different colour, and rendering them visible in the respective or any other colour by illuminating them from different points, the positions of which are in planes perpendicular to the lines of the gratings on the respective transparency, but can be varied to alter the angle of incidence of the rays, so as to obtain spectra overlapping, and at the same time crossing, each other; and in the method of producing such diffraction transparencies from photographs and for some purposes without the aid of photography.

On the sheet of drawings appended hereunto, figs. 1 and 2 show a diagrammatic view of the apparatus employed for rendering the diffraction transparencies visible in various colours in elevation and plan.

Figs. 3, 4, and 5 diagrams of the positions of the spectra for viewing the objects photographed in their natural or other colours.

Fig. 6 shows a design in colours; figs. 7, 8, and 9, the three diffraction transparencies produced from photographs through, say, green, red, and blue screens, and fig. 10 the three transparencies superposed.

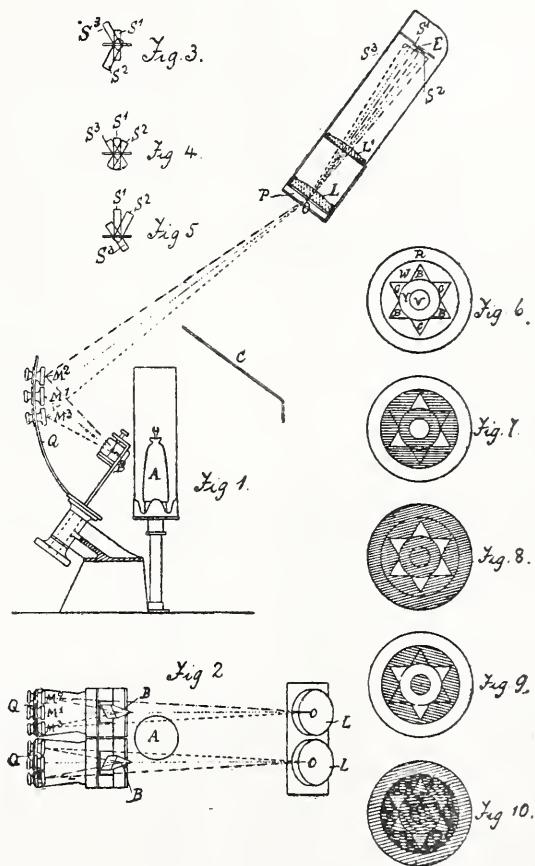
In carrying my invention into effect, in the case of natural objects to be rendered visible in their natural colours, at least three separate photographic negatives, taken through coloured screens, and positive transparencies printed from them, are necessary; but I do not limit myself to this or any number of such photographs or transparencies, as for

certain purposes more are advantageous. These transparencies, however, are only used for printing other diffraction transparencies, the following manner of performing this operation being a convenient one.

A glass, or other suitable transparent plate, is coated with a sensitive film of bichromated gelatine, which is kept in a somewhat soft state until exposed to light by the addition of a small percentage of some suitable substance, such as glycerine. On this film is mounted a celluloid or other suitable replica of a diffraction grating, of preferably from 10,000 to 40,000 lines to the inch, the ruled side being in contact with and, preferably, impressed into the gelatine film, so as to produce the grating lines on the film by mechanical action.

One of the original isochromatic transparencies being now laid over the plate prepared as aforesaid and exposed to sunlight or other suitable source of light, the portions of the gelatine film under the clear parts of the transparency will be rendered more insoluble in water than those parts which are under the opaque portions of the transparency. The celluloid or other grating being now detached or dissolved by a solvent having little or no effect upon the gelatine, such as acetone, and the plate washed in water, the reproduction of the grating is found upon the gelatine, varying in the intensity of its diffractive action according to the proportion of light each part has received through the transparency.

In making these diffraction transparencies from the different original



isochromatic transparencies, the lines of the grating are placed in each of them at a different angle to the picture, so that each transparency is lined in a different direction from the others, all the gratings, however, having the same spacing, which preferably is as fine as possible.

In order to make this method of preparing the diffraction transparencies perfectly clear, I will now refer to the drawings. Fig. 6 represents a coloured plaque or design to be photographed and rendered visible in colours, R denoting red, w white, g green, b blue, y yellow, and v violet. Of this plate three negatives are taken through green, red, and blue screens, and positives printed on glass or other transparent plates in the ordinary way. It is obvious that in these positives only those parts of the plaque will be quite clear that contain the pure colour corresponding with that of the respective screen, and more or less clear in the parts of a colour into the composition of which the colour of the screen enters, and be opaque on those parts the colour of which does not contain the colour of the screen. Thus, in the transparency taken through the green screen, the parts marked g on fig. 6 will be clear, and those marked w and y more or less so, while the rest will be opaque. When this transparency is placed upon the plate coated with a sensitive film of bichromated gelatine, into which a replica of a diffraction grating has been impressed, and exposed to light, as described above, the parts marked g, w, and y, on fig. 6, will transmit light, and the bichromated film be rendered more or less insoluble, while under the other parts it will remain soluble, and, after being washed, a lined transparency, as shown by fig. 7, will be obtained,

the grating lines on this transparency being placed, say, horizontally, as indicated.

In the same way the diffraction transparency obtained from the transparencies taken through the red screen will be as represented by fig. 8, the celluloid replica of the diffractive grating being in this case impressed upon the bichromated film at an angle to the horizontal as shown, the angle of the lines being preferably ten degrees or less, but shown exaggerated on the drawing for the sake of clearness.

The diffraction transparency obtained from the transparency taken through the blue screen will be represented by fig. 9, the diffraction grating being in this case impressed upon it at an angle inclined to the horizontal in the opposite direction to that used for the transparency (fig. 8).

If more than three transparencies, obtained through other coloured screens, are used, the lines on the diffraction transparencies made from them are preferably placed at intermediate angles corresponding to the position of the respective colour in the spectrum.

The three diffraction transparencies (figs. 6, 7, and 8), hereinafter called the green, red, and blue plate respectively, are now, preferably, permanently superposed with the picture or image coinciding, as shown on fig. 10, and when viewed or projected in a suitable manner, either by reflection or transmission, are seen in colours; and, where the isochromatic photographs are taken from natural objects, with the natural differences of light and shade.

For the purpose of viewing, preferably the first order of spectra from transmitted light is used and brought to a focus at the eye by means of a lens placed immediately above the transparency, and when the picture is in good definition as seen by an eye lens such as is used in the stereoscope, each transparency being illuminated only by direct or reflected light in a plane perpendicular to the direction of the lines upon it, while the actual light is screened from the eye, the picture on each transparency is seen uniformly coloured according to the portion of the spectrum yielded by the grating, and, when the lights or mirrors reflecting the light are moved into such positions that the diffracted pencils from each transparency transmitted to the eye are of the same colour as the screens through which the original photographs were taken, the picture appears in its natural colours.

By figs. 1 and 2 an apparatus suitable for viewing is represented diagrammatically in elevation and plan.

In this apparatus the points of illumination, lenses, and images on the transparencies are duplicated so as to obtain the respective spectra and images at two eyescits, for the purpose of showing the photographed object stereoscopically.

On the drawing, A represents a Welsbach incandescent burner from which the light falls through slits upon two totally reflecting prisms, B, which reflect the rays of light to the reflectors, M. Instead of the burner, A, and prisms, B, in some cases two incandescent filaments in the position of the prisms may be used with advantage. The light from the mirrors falls upon the combined diffraction transparencies, P, and passes through the lens, L, and the picture is viewed through the stereoscopic lenses, L¹, and narrow eyescits E. C is a screen to shield the transparencies from the light of the burner.

For the purpose of causing the rays of light to fall on the respective diffraction transparencies lined with gratings of uniform space but different inclinations to the picture, in a plane perpendicular to the inclination of the lines, and to vary the angle of incidence, the reflectors, M, are attached to the surface, Q, of an ellipsoid of revolution, the major axis of which is in the line of the reflecting point of the respective prism, B, and the centre of the lens, L, which are in the foci of the ellipse, the rotation of which round the axis forms the ellipsoid. It is evident that the light rays from the prism will be reflected to the centre of the lens in any position of the reflectors, M. Slots radiating from the axis are formed in the surfaces, Q, so as to vary the position of the mirrors, M, and the angle of incidence. The inclination of these slots to the vertical is the same as the inclination of the grating lines to the horizontal, so that the rays, B, M¹, O, are in a vertical plane perpendicular to the lines on the green plate, the rays, n, M², O, in a plane perpendicular to the lines on the red plate, and the rays, B, M³, O, perpendicular to the lines on the blue plate. The three gratings diffract the rays transmitted by the mirrors into spectra in the same planes as the rays, and, if the respective angle of incidence is so arranged by shifting the mirrors that the green part of the spectrum, S¹ (fig. 3), formed by the green plate, the red part of the spectrum, S², formed by the red plate, and the blue part of the spectrum, S³, formed by the blue plate, fall upon the eyescit, the photographed object will be seen in its natural colours, the eyes being preferably placed at a short distance from the eyescits.

If the position of the mirrors is changed, the colour received into the eye from the different plates will be changed. By placing the mirrors, M² and M³, into the line of mirror, M¹, for instance, the green part of the three spectra will be transmitted through the slit, as represented by fig. 4, and the object will appear all green; by shifting the three mirrors to the top it will be shown all red, and by shifting the three mirrors to the bottom it will appear all blue. By shifting the mirrors, M¹ and M², to the bottom and the mirror, M³, to the top, the blue parts of the spectra from the green and red plate, and the green part of the spectrum from the blue plate, will fall into the eye, as represented by fig. 5, so that the

green and red portion of the photographed object will appear blue, and the blue parts green. It will be evident that by altering the positions of the mirrors any part of each spectrum can be made to fall into the eye, and any variety of different colourings besides the natural colours rendered visible.

In some cases the mirrors, M, may be replaced by incandescent filaments movable in the same way, and the prisms and burner, or other source of light, omitted.

In the case of flat objects, such as designs of wall papers, for instance, or where a stereoscopic effect is not to be produced, of course only one set of reflectors and one source of light and diffraction transparent photographs are required.

In the case of designs in two colours, of course only two diffraction transparencies and two reflectors will be wanted. The diffraction transparencies for such designs, and the like, can be produced without the aid of photography, by placing a celluloid replica of a diffraction grating over the design, or drawing it upon such replica, and painting for each colour the parts having a different colour with varnish to fill up the grating spaces, placing the grating lines at a different angle for each colour. Thus the three plates (figs. 7, 8), and 9, can be obtained by placing three celluloid gratings over the design (fig. 6), at the respective angles, and painting the white parts in figs. 7, 8, and 9 with transparent varnish, which, when superposed and inserted into the apparatus, will show the design in its original or any other colours, in the same way as the gelatine diffraction transparencies obtained from photographs taken through isochromatic screens in the manner hereinbefore described. The transparencies may likewise be produced by printing on the celluloid gratings with varnish or like filling, and making transparent replicas of them in the manner hereinafter described.

It is obvious that where the photographed object is a design, or where a design is specially prepared as a transparency in the manner herein last described, from one to a considerable number of transparencies, with gratings of the same spacings but different inclinations, may be used, and that an unlimited variation and combination of colours may be produced by the means hereinbefore described.

Instead of using the gelatine diffraction transparencies obtained from the photographs, or those obtained directly without the aid of photography, by the processes hereinbefore described, celluloid replicas of them may be made, mounted, and superposed in the manner adopted for the gelatine transparencies. This can be done by smearing the original with a thin oil, such as watchmakers' oil, and pouring the celluloid solution upon it; when set, the replica can be readily pulled off.

SZCZEPANIK'S METHOD.

[Patent No. 7729 of 1899.]

If a plate, e (hereinafter for shortness called a line plate), provided with fine transparent lines, is placed between a matt screen, a (fig. 1), on which the image of the object, b, is to be projected, and an objective, c, in which a diaphragm, d, provided with a square opening, has been placed, then the image appears on the matt screen in bands or lines which correspond to those of the line plate. If the line plate is moved further and further from the matt screen, then the bands forming the image become broader and broader, until, when a certain distance is reached, the lines or bands of light unite to form a sharp, unbroken image, which is, of course, less illuminated than an image projected without a line plate. If, instead of the diaphragm with the square opening (fig. 2), a diaphragm (fig. 3) is inserted, the opening of which has the same height as that of the diaphragm shown in fig. 2, but has a less breadth, then, again, the image is less illuminated. If, whilst the other conditions are kept the same, a diaphragm is inserted which, in the vertical direction, is only one-third open (figs. 4, 5, or 6), there are, again, formed on the projected image black lines or bands, which are twice as broad as the light ones. Thus the width of the lines or bands of light is in direct proportion to the height of the opening in the diaphragm if the distances of the line plate from the objective and the matt screen remain the same.

A consideration of fig. 1, in which are shown the limiting rays corresponding to the several diaphragms shown in figs. 4, 5, and 6, will make the phenomena just described completely clear.

The transparent lines, or the line plates themselves, may have any desired positions (for example, vertical or oblique) if the diaphragm be arranged to correspond. The line plates, instead of having straight-transparent lines (fig. 7), may be provided with wavy or zigzag lines (fig. 8 or 9 respectively).

As has been stated, when a completely open diaphragm (fig. 2) is used, a complete image is obtained. A complete photographic image can also be produced by means of the three partly open diaphragms (figs. 4, 5, and 6), if they are used one after another in the manner hereinafter described.

Together with each separate diaphragm, a colour filter (1, 2, or 3) of the kind used in three-colour printing is arranged in front of the objective, and in the end a sharp negative is obtained, which, in consequence of the employment of three diaphragms, exhibits three times as many lines as the line plate. The picture will thus consist of successive groups, each composed of three lines, which, on the negative, are of course monochrome, but in different shades corresponding to the red, yellow, and blue colour filters 1, 2, and 3 respectively.

The same result is attained if, instead of three diaphragms one after another, a single diaphragm (fig. 10) is used, the opening of which is provided with filters of like height for the red, yellow, and blue rays, arranged one above another.

If a diapositive or transparency (hereinafter called a diapositive) is produced from the negative that is obtained, a coloured image, representation, or picture, can be projected by means of the apparatus shown in fig. 1. In this case, *a* represents the diapositive, *e* (as formerly) the line plate, *c* the objective, *d* the diaphragm (with red, yellow, and blue plate). In front of the diapositive a condenser, *f*, of known kind, is arranged, and *b* the coloured image, representation, or picture, is produced. It is evident that the line plate, *e*, must occupy exactly the same position in relation to the diapositive as it did in relation to the negative during taking, since otherwise it might come about that, for example, the yellow rays impinged on the red filter. To remove this defect by adjusting the line plate is very difficult. Another device is therefore provided by means of which the correct adjustment can be effected without displacing the line plate. This device consists of a diaphragm which, as is shown in fig. 11, possesses, in addition to filters for red, yellow, and blue (1, 2, and 3, respectively), as shown in fig. 10, two other filters, one above and the other below this group of filters, the upper one being for the blue, and the lower one for the red. By shifting such a diaphragm inside the objective vertically, the defect hereinbefore mentioned can be removed,

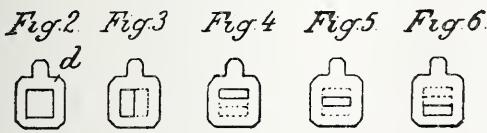
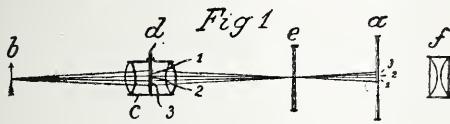


Fig. 10. Fig. 11. Fig. 12.

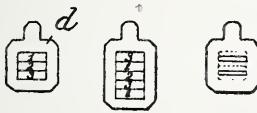


Fig. 7. Fig. 8.

Fig. 9.



This diaphragm permits of three different serial arrangements of the colour filters—namely, red, yellow, blue (1, 2, 3); yellow, blue, red (2, 3, 1), and blue, red, yellow (3, 1, 2). The shifting of the diaphragm may be effected by means of a screw or in any other suitable way.

As already stated, an image or picture projected in the manner described contains three times as many lines as there are in the line plate, and each three successive lines appear in the three fundamental colours (red, yellow, and blue). These lines are, however, so closely packed together that the eye cannot distinguish them separately, and thus the desired colour effect is attained.

The image or picture is the better the more closely the lines are packed together on the plate, *e*. The production of such closely lined plates, however, is limited by commercial and technical considerations. On the other hand, the number of lines composing the image can be increased by further division of the diaphragm. The opening in the diaphragm may be divided, for example, into six or nine parts, instead of three, so that two or three times as many groups of lines (each consisting of three-colour lines) appear as in the case of the tripartite diaphragm. A single diaphragm having its opening divided into six parts is provided with two rows of colour filters, one above the other, and each such as shown in fig. 10; fig. 12 shows by way of example one of three separate diaphragms to be used one after another instead of a single diaphragm provided with six colour filters as just described, the diaphragm shown being provided with two colour filters for yellow rays. A negative produced with a single diaphragm having six colour filters, or with three diaphragms of the kind illustrated in fig. 12, thus contains six times as many lines as there are in the line plate, and is therefore much more accurate than a negative produced with the tripartite diaphragm.

If the line plate is made of suitable thickness and provided at the back

with a layer sensitive to light, this plate can serve at the same time as a photographic plate. Inversely, the photographic plate can be provided with fine transparent lines on a dark ground on the side away from the light-sensitive layer. Such a plate also forms a means of producing pictures or images in natural colours. When employing such a photographic line plate the distance of the light-sensitive layer from the line surface is always the same; the plate must therefore be kept exactly at the same distance from the objective when projecting as when taking.

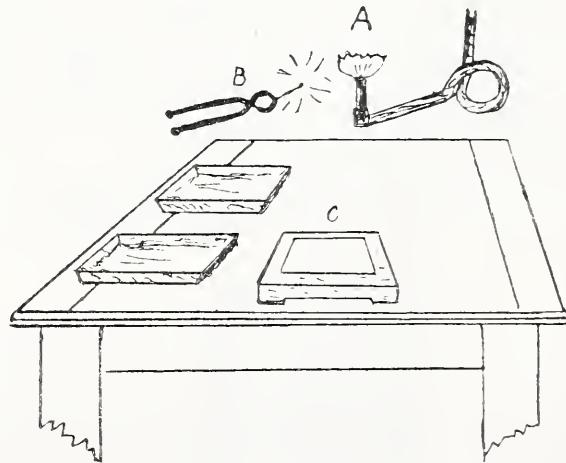
HOW TO WORK VELOX IN QUANTITY QUICKLY AND CHEAPLY.

LET it be understood at the outset that the paper we are dealing with is Carbon Velox, as the other varieties require different treatment to that given below.

An essential condition to success with Velox is *correct exposure*, therefore we will give a few hints on the same.

The most convenient and accurate means of printing Velox is by magnesium ribbon, and, for an average unstained negative, a length of about half an inch, burnt at a distance of one foot, is about correct. The best plan is to always burn the ribbon at one fixed distance from the printing frame, and there is only one variable factor in determining the length of ribbon required for exposure, i.e., the density of the negative.

In most houses a sliding gas jet is to be found, and a table either under it or very handy. Put a table or other suitable stand underneath the jet, and pull it down as far as it will come; you will then have a most ready way of burning the magnesium at a fixed distance, for you have only to place the printing frame containing negative and paper on the table, nearly, but not exactly, underneath the gas-burner, light the gas (not turning it too high), and then take a piece of magnesium ribbon of the right length for the negative in use, hold it with an old pair of pincers or the points of a pair of scissors, put it in the flame till alight, then withdraw till just over the flame, and move it to and fro while burning, taking care to keep the same height as the gas flame. This operation is in practice performed very quickly, as the ribbon burns at the rate of one inch in two and a half seconds. The accompanying sketch will convey the idea of position, &c.



A, gas flame. B, pincers, with ribbon burning. C, printing frame.

You can thus produce any number of prints easily and quickly, as you can place two empty plate boxes (with lids on) at your left hand, one for the unexposed paper and the other for the prints. (See that the lids are on during the exposure.)

To make a good vignette on Velox it is necessary to place the vignetting screen about one and a half inches above the negative, cover the opening with the tissue paper in which the Velox is wrapped, and exposure as above, giving about three times the ordinary exposure for the same negative.

We now come to the developing. I give two methods of doing this, so that the reader can choose for himself which to employ.

The following is the developer used in both cases (I am aware this is contrary to the Company's instructions, but its use is justified by results):—

Rodinal	1 part,
Water	16 parts,
and add 10 grains of sodium sulphite to every 10 ounces of water.	

Before developing, make up the fixing bath either according to the Company's formula, or a plain hypo bath of 4 ounces to the pint, with which I have never had any stains when working as below.

Now, for developing, get two dishes, pretty deep ones; in one put clean water, and take your prints and put them one by one into this-

water, taking care not to let them stick together. When you have put them all in, pour your developer in the other dish, allowing about 6 ounces of developer to a dozen half-plate prints, and, as quickly as possible, transfer your prints from the water to the developer, one by one and face up, taking from the water with one hand and pushing down into the developer with the other; at the same time keep them moving, and prevent them from sticking, in fact, treat them in the same manner as toning P.O.P., only you will have to handle them much quicker, as they develop fast. If they come up slowly, you have under-exposed, and to try to bring them up will very likely result in stain.

As soon as any one is fully developed (do not overdo it), take from the developer and throw in the fixing bath, face up, either direct or after a slight rinse in cold water, pressing it under with a glass rod, bone spoon, or anything which will not injure the print and is long enough to prevent the hypo from touching the hands. After all the prints have been placed in the hypo, let them fix for ten to fifteen minutes, then wash well for about an hour.

Let me again emphasise two essential conditions of success, viz., correct exposure and freshly made-up developer; also allow plenty of fixing bath.

SECOND METHOD.

This method, though rather slower than above, is practically free from any liability to stain.

One dish only, in addition to the fixing bath, is required, and this would preferably be a shallow, flat-bottomed porcelain dish.

Take one print and place it face up in the dish, flood with water, and allow to stand while you put 4 or 6 drachms of the above developer into a measure (4 for a cabinet size and 6 for a half-plate print), then pour the water off the print, which will leave it perfectly flat on the dish bottom; take the developer and pour it at one sweep over the print, taking care it covers the print well; watch carefully, and, when completely developed, pour the developer off and again flood with water, which will lift the print from the bottom of the dish; take it out and throw in the hypo, pressing under with a glass rod, &c., as before, washing and fixing same as mentioned above.

I may point out that the cheapest size of Velox is the cabinet size, which is just the right size for cabinet mounts without any trimming. Mounted on a plate-sunk, half-plate mount, it gives a very pleasing width of margin.

The other varieties of Velox I have not referred to in detail, as they are not quite so easy to work, nor as certain in results, as the carbon.

The Special Portrait Velox has a splendid matt surface, but requires far more care in exposure and handling, as it is about four times as sensitive as Carbon Velox, while the Glossy Velox is extremely liable to surface markings. Therefore, for all-round work, the Carbon Velox is to be recommended, and, if treated as described, the results will be practically indistinguishable from platinotypes.

I do not claim novelty for these methods, but I have not yet seen a similar method described, and, as they are the result of much experiment and experience, I think it will commend itself to your readers.

R. N. HEPWORTH.

RETOUCHING, AND ITS ABUSE.

We often hear old staggers tell of the excellent portrait work they remember in the 'fifties and 'sixties; how there was a virility and force about some of it that is seldom excelled now, with all our added knowledge and improvement in apparatus. Looking through a collection of the earlier examples of photographic art, what is it that strikes most of us at first sight? Probably, in nine cases out of ten, the absence of any retouching, or, at most, the very slight amount of such. Our predecessors were not so terribly afraid of a truthful presentation of their sitters as most of us are nowadays. And so, though their accessories and backgrounds, to say nothing of their ideas of posing, are, in our modern eyes, grievous and heart-breaking, yet what life and character these fast-fading old prints possess!

It is the fashion now, the public demand it, and will have it—or so at least the *à-la-mode* photographer will tell you—to smooth the face into marble-like evenness and coldness, extracting in the process nearly all those lines and expression marks that indicate personality. It is positively appalling to look at some of the specimens of so-called "high-class retouching," such as will be sent in answer to any ordinary advertisement for an assistant. The demand, of course, creates the supply, and so we get lovely feminine faces by the dozen, impossibly lovely, insipid and unnatural, and masculine lineaments, or what should be so, robbed of every vestige of manliness and decision by a similar process of over-flattery. The hoary-haired septuagenarian smirks with the even and placid visage which, perhaps, was his three decades ago; or the happy matron, *passée* and not too slender, smiles at us with the beauties of "sweet seventeen" and a sylph-like figure!

Now, we must not wholly blame the retoucher. As has been said, the demand creates the supply. An inartistic race of photographers, realising the power that retouching often has to atone for bad lighting and operating, have demanded a certain article, and have, in many cases, got more than they bargained for. At the same time the supply has assisted

the demand. Employers, seeing constantly nothing but the usual variety of retouching, have got accustomed to it, expect it, and require it. The man who can make their negatives smoothest and cleanest, who can most successfully extract all lines and wrinkles, and deduct ten years from the sitter's age, passes with them for the best retoucher, and is engaged accordingly.

It may be useful in connexion with this subject to have a perfectly clear idea in our minds of what retouching essentially is. The correct technical definition, probably, will be that it is pencil or other work on a negative, rendered necessary by the fact that the camera exaggerates and emphasises any imperfections in the face, and tends to render the shadows too heavily, giving also an undue importance to spots and freckles. If retouching were simply confined to rectifying the exaggerations of the camera and the inherent imperfections of a photograph, there would not be much ground for complaint. As, however, the photographer does not exist to preach theoretical perfection to an indifferent public, but has to remember his banking account, this, of course, is practically impossible, be it never so desirable. A certain amount of flattery, and making up for Nature's omissions in the bestowal of good looks, must inevitably be practised if the goodwill of our clients is to be gained.

There is, nevertheless, a wide gulf between a little legitimate flattery and a wholesale destruction of likeness and identity. Some of us have got so used to this latter that a little reflection often becomes necessary to convince us of its existence. We have only to compare a typical highly finished photograph of one of our friends with that friend in person, and conviction will generally follow that the former is about as lacking in candour as it well could be.

At Scotland-yard a sort of register is kept of all criminals and suspects coming under police attention, illustrated with photographs of these interesting individuals. It is only necessary to mention that these portraits are preferred by the authorities in an untouched condition, and it becomes evident that some one at least is aware of the deceitfulness of "the usual thing."

Of course, no one wishes to insist on unalloyed truthfulness in a portrait; this would be often extremely undesirable, even from an artistic point of view. We want to see the sitter at his best, with his unpleasant features, if there are any, just sufficiently held back, and his good points relieved and shown to advantage by judicious lighting and after-treatment, under which head we include a legitimate amount of pencil work.

It is more than likely that much of our bad retouching is due to bad lighting and operating. It is quite possible, with the better opportunities we now possess, to obtain negatives which shall require a very slight amount of working up, more especially if isochromatic plates are used. It really seems, however, to be the settled opinion of many operators that they have simply to expose and develop the plate and the retoucher will do the rest, making amends for all errors of lighting, exposure, and the like. If the negative is under-exposed, what matters it so long as it is not utterly unrepresentable? The pencil-wielder will tone down all the heavy shadows which result and matt-varnish it for him. What if it is over-exposed and flat? This quite indispensable individual will work up the high lights, and bring sparkle and brightness where none before existed. And so with defects of lighting, often the most serious, and all the ills that a negative is heir to; the same magician is trusted to have a panacea that will cure them.

The natural result of this is that retouchers get so used to doing much work when it is wanted, that they end by indiscriminately overworking everything, without rhyme or reason; and the operator does not use his best endeavours to obtain as nearly perfect a negative as possible, having learnt to be content with a second-rate result.

The over-retouched print satisfies the public, for the simple reason that their taste is not yet sufficiently educated to appreciate better things.

They are not, however, by any means so Philistine as they are often represented to be, as is amply proved by the generous recognition always given to genuinely artistic work. It is an infallible truth that good taste always conquers in the long run, be the reign of the ugly and vulgar never so seemingly secure. As an instance of this near to hand, let us note how our furniture and interior decoration has undergone such radical change since the day, not so long gone by, when hideous solidity and stiffness held their own triumphant. So may we be well assured that, near or distant, the time is surely coming when the public will scorn the type of portrait which "now delights their souls and will insist on having a genuinely truthful and satisfactory work of art. Why should we not try to anticipate, to be a little ahead of our generation, rather than a good way behind?"

It goes without saying that the best portrait work of our leading men is beyond the reach of any reproach on the score of over-finishing. We have only to recall the productions of such pioneers as William Crooke, Craig Annan, W. M. Warneke, and Caswell Smith, to mention a few whose names are household words in the camera world, to perceive, more plainly than any amount of critical teaching could impress on us, how much room for improvement there is in the average show-case.

There are already, fortunately, many gratifying signs of a change for the better in our sitters' ideas on this subject. It is not so rare now to have them request that their negatives may not have much retouching bestowed on them, and that their lines and wrinkles be not interfered

with. In many ways they now show an intelligent understanding of the good points and defects of a photograph, as many careless workers are daily finding out to their cost. Perhaps it is written in futurity that the time may even arrive when the photographer will refrain from excusing anything tawdry or tasteless in his work by what he evidently considers the clinching argument that the public like it, and must on no account fail to be gratified by a plentiful supply of it. It would probably be difficult to name any other profession or business where this semi-apologetic remark is so often heard. On the whole, it is certainly a remarkable libel on the public, who are ever quick to perceive what is good, and to adopt and patronise it accordingly, to the best of their ability.

A. LOCKETT.

NOTES ON MOUNTING PRINTS.

I HAVE several times noticed, when reading through practical works on photography, that the chapter devoted to the mounting and finishing of the photograph never looks as if it had been written with the enthusiasm so conspicuously a feature of the other chapters, and, in bad cases, there is a deliberate intention to shelve or Burke the subject, as if really too simple a matter to write about, whereas we all recognise it to be a most important subject. I really think the mounting of photographic prints has been little better than a nuisance from the earliest days. Prints on albumenised paper certainly gave less trouble than the modern P.O.P., but the paper was thin, and stretched considerably, and, unless great care was exercised in the selection of mounts (referring more particularly to large sizes), the surface showed up any defects little or much, all which difficulties present themselves to a more or less degree to-day, for we have all of us, for instance, to keep an eye open for the elusive bristle.

I think something might be done on lines similar to the old (and satisfactory) method of mounting the prints face down to good-quality glass plates. This old method still has its uses, and for filling up panels and covering our walls there is no simpler or better plan. Where only one or two prints are wanted, or where one wishes to show results quickly and display them to the best effect, the glass-mounted photograph easily surpasses the cardboard presentation. Now, of course, the objections to the method are on the score of weight, and bulk, and risk of breakage, but why not do something with a thin, but not too thin, celluloid film, to which we could squeegee the print for permanent support?

I judge by the sale of ready-made mountants that the average amateur seldom uses the home-made starch paste. Starch paste freshly prepared, which fairly thick, squeezed through muslin, and put on with a brush, has shed all its roving bristles, is probably the safest preparation to use as regards the permanent character of our work; and, if it would only stick a little better at the corners and along the edges, what a boon and a blessing starch would be. On the enamelled surfaces a starched print adheres without the least difficulty; but, with the plain Bristol board, troubles are liable to crop up. These troubles are due partly to the fact—the usual fact—that the prints are unevenly dry. If a print is curly at the edges, and most of them are, it denotes a dryness which has not reached the centre. Such prints may be mounted upon an enamelled board easily with any good mountant; but, if Bristol boards are used, they are best sized beforehand with a solution of gelatine (five per cent.) applied hot by means of a Blanchard brush, viz., an appliance somewhat in the form of a squeegee, the rubber being replaced by two or three folds of lint. The board, when dry, should show no signs of glaze, and, on application of the starched print, breathing also over the mount, we may generally secure the adhesion of the print.

A great deal of care is requisite in order to get perfect results when the richly glazed variety of print is required. I know that amateurs use plate glass freely for the purpose, and some few of them get very clean results. Examine with a lens the surface of some glazed prints, however, and you will find many evidences of tiny pieces of fluff, dust, and other extraneous matters. This is scarcely surprising when we consider how the operator works away at his glass or vulcanite with silk handkerchief or flannel. The surface is, of course, rendered highly electrical, and every tiny, microscopic piece of matter in the immediate vicinity is at once attracted, and the man wonders what the Dickens is the reason he cannot get a clean surface. A well-washed leather is by far the best to use with which to wipe the glass, but reason points rather to the use of separate glasses for each print, as then the two surfaces can be brought together under water, and the dust fiend altogether eliminated.

Whatever the mountant—starch the commercial mountant, or rubber solution—difficulties are bound to be met with if the prints are not uniformly dry over the whole surface. Prints which have been glazed and thus exposed to practically a uniform desiccation are, I think, certainly easier to mount than those which, after the usual drying, have been stored one on top of the other unevenly, exposed to whatever degree of moisture or dryness there may be in the atmosphere. Although we may secure this uniformity, in some degree, by keeping prints rolled tightly round cylinders, face out, with a piece of clean white paper folded outside, the glazed print will always be the better and most uniformly dried, and consequently the easier to mount.

J. PIKE.

Our Editorial Table.

PYRAXE.

Agents: Fuerst Brothers, 17, Philpot-lane, E.C.

PYRAXE is the name given to a form of solid pyrogallol (or, as it is still erroneously called, pyrogallic acid), which is manufactured by Messrs. Hauff & Co., and a sample ounce of which was sent us by Messrs. Fuerst Brothers. Produced in fine white crystals, one ounce of Pyraxe occupies the space of a one-ounce bottle, whereas, as is well known, an ounce of the flocculent sublimed pyrogallol requires bottle space of about twelve-ounce capacity.

One shilling an ounce is charged for Pyraxe, which we found freely soluble, and, so far as we have been able to judge, quite as suitable in development as the older form of pyrogallol.

THE "FORWARD" STUDIO CAMERA AND STAND.

Manufactured and sold by O. Sichel & Co., 52, Bunhill-row, E.C., and 47, Oxford-street, W.

We do not hesitate to say that this handsomely built camera, which we examined recently, would form an ornament to any photographic studio, whilst its efficiency as a practicable instrument for portrait work, &c., is undoubted. The camera is made in mahogany with brass bindings, but the particular one we inspected was of walnut with nickel fittings, and we were much struck by its excellence of finish and construction. Whether in walnut or mahogany, it is fitted with a double swing and repeating back, which takes one back for slides, holding carriers for $8\frac{1}{2} \times 6\frac{1}{2}$ and cabinet plates, and another back with roller



shutters containing carriers for larger plates. The backs are easily fixed and removed by turning a screw or pressing them into a spring. The smaller back is fitted with a hinged focussing glass, and a focussing glass is supplied for the larger. It fixes in the same way as the back itself. The front part is movable. The lens can be lowered or raised, and is fixed in a very simple and ingenious way. The square bellows is supported by an arrangement, which prevents sagging. The camera extends to double its natural length. The stand is of black ebonised wood, and is fitted with an easily controlled tilting system.

This bare outline of the Forward camera's principal features will

show the professional reader that it is well adapted for all-round studio work. Our own opinion of it as a piece of apparatus is that it would be a difficulty to surpass it in convenience and usefulness. It has a range from a very short focal length to fifty-four inches and works with the utmost ease and smoothness.

KELLY'S DIRECTORY OF CHEMISTS AND DRUGGISTS. 1900.

691 pp., price 20s.

London : Kelly's Directories, Limited, 182-184, High Holborn, W.C.

THE ninth edition of this invaluable work has been issued. In addition to chemists and druggists, the names of manufacturing chemists, dentists, veterinary surgeons, wholesale druggists, drysalters, mineral water manufacturers, photographers and photographic material dealers, surgical-instrument makers, and other trades are given. In this edition the names of the Isle of Man and Channel Islands are included for the first time, and it should be said that besides England and Scotland the Directory also extends to Ireland, which has only been included in later editions. The names of over 49,000 persons are given in the Directory, of which it is the bare truth to say that to the members of the various trades with which it deals it is quite indispensable. It is obviously compiled with Messrs. Kelly's usual care and accuracy.

PHOTOGRAPHY IN COLOURS.

By R. CHILD BAYLEY, F.R.P.S. 74 pp., price 1s.

London : Iliffe, Sons, & Sturmey, Limited, 3, St. Bride-street.

IT is no easy thing to write a book on colour photography in such terms as shall make the subject clear to the general reader; but Mr. Child Bayley in the volume before us has quite successfully accomplished the task of giving a perfectly simple exposition of his theme, almost wholly avoiding, at the same time, its more abstruse physical and chemical aspects. The author's well-known faculty of discoursing lucidly upon highly involved scientific topics comes to his aid in his description of the processes with which the names of Lippmann, Ives, Joly, and R. W. Wood are associated, while the chapters on the nature of colour, the undulatory theory of light, colour vision, and other matters of underlying theory are equally interesting and explanatory. The author's final conclusion is that photography in natural colours has never been accomplished and never will be, "pigmentary" colour photography being understood in the reference. The book is admirable in its explicitness and conciseness.

Studio Gossip.

WE are sorry to learn that an old and esteemed friend of the JOURNAL, Mr. John Stuart, of Glasgow, a Past-President of the Convention, has lately been in poor health. It is hoped, however, that a rest and change will fully restore him to his usual vigour.

THE QUEEN AND WAR PHOTOGRAPHY.—Her Majesty the Queen is collecting portraits of the soldiers who have distinguished themselves in South Africa. She has a likeness of every general in the field, and is getting one of every officer who especially distinguishes himself. She has the portraits of several private soldiers, and is to obtain photographs of all the soldiers recommended for the Victoria Cross. Lady Roberts has presented the Queen with a portrait of her son.

THE NATIONAL BAZAAR.—Messrs. Langfier (Limited), of 23A, Old Bond-street, W., have been appointed the sole official photographers to this week's National Bazaar, and have also been intrusted with the preparation and publication of a very handsome souvenir in connexion therewith, which, besides containing photographs of all the prominent people interested in the promotion of the Bazaar, will also include contributions by persons eminent in literature, science, art, and music. Messrs. Langfier have presented the Committee with 10,000 coupons (entitling the holder to three photographs), which are to be sold by them at 10s. 6d. each, the entire proceeds to be handed over to the Fund in Aid of the Sufferers by the War.

THE ROYAL ACADEMY.—A contemporary writer prints the following unfavourable criticism of this year's Exhibition at Burlington House: "I have been prowling about the Royal Academy for some days past, and have been made exceeding sorrowful, not so much by what I have seen there as by the hopeless acquiescence of the critics in the present deplorable condition of English art. The Academy Exhibition never has been, and could never hope to be, a display of wholly fine and worthy work. It has from time to time afforded us great art, but it is frankly impossible that all its pictures, drawings, sculptures, modellings, and the rest should be high above the level of mediocrity. That is an inescapable thing. The Academy is not to blame for the fact that there are not 500 craftsmen of the first rank alive in any given year. It is to blame for the feeble aid it affords to the art it is supposed to cherish, and so neglects and even stultifies, that wealthy London offers about the worst school in which an ambitious and capable young painter may study. It is to blame for the ridiculous and selfish conservatism which has excluded from its walls the works of men who have achieved brilliant reputations in spite of it; it is to blame for the spirit which has turned a national institution into a coterie. For all these things it has partly to thank the terms of its charter and partly the inherent determination of human nature to make the

selfish best of a good thing which cannot be taken away from it. But the Press, which has the power to shake it from its apathy, seems itself asleep, and dozens of monstrosities go unrebuted annually, as if they were hedged about by a sort of divinity because of their surroundings. It is the current and the natural belief that the Academy is open to meritorious work alone; it is the current and the natural belief that it is made up of the work of Englishmen, or that in the main at least it represents the English school. Both these ideas are illusory. In the Exhibition of this year the most notable portraiture is from the hands of Mr. Sargent and M. Benjamin Constant, an American and a Frenchman. In historic painting there is nothing to compare with the work of another American, Mr. Abbott. In criticism it would seem to be essential only to have mastered a certain cant. We appear to have done with our ancient friends 'brio' and 'chiaroscuro', but we have got into another jargon about a painting being 'wrought' and 'observed with insight' and the 'vivid gesture' of a painted little finger. As I happen to know personally, a great number of the men who criticise the art-shows of the year are thoroughly acquainted with the traditions and principles with which they profess to deal; but they do not express their genuine opinions. Whether, from mere kindness or a timid desire to avoid offence, they write smooth things, and, partly as a result of their amiable banalities, the chief artistic association of the country is steadily going backward."

News and Notes.

IN consequence of so many astronomers being away with the object of seeing the solar eclipse of May 28, the annual "visitation" to the Royal Observatory, Greenwich, will be postponed until the end of June.

MESSRS. TENNANT & WARD, of 289, Fourth-avenue, New York, inform us that the increasing demand for the *Photo-miniature* has necessitated third editions of No. 1 ("Modern Lenses") and No. 2 ("The Pose in Portraiture"), and a second edition of No. 6 ("Orthochromatic Photography"). These three numbers thus reach their 800th each.

ROYAL PHOTOGRAPHIC SOCIETY.—The exhibition of pictures by Mr. F. H. Evans will close on Saturday, May 26, at four p.m. On Tuesday, May 29, at eight p.m., Dr. P. H. Emerson will open an exhibition of some 140 examples of his work. It will remain open until June 30, on presentation of card, from ten till four p.m., Wednesday ten to eight.

AINTREE PHOTOGRAPHIC SOCIETY'S EXHIBITION.—One of the features at this Society's Seventh Annual Exhibition, in November next, will be a lecturette competition, open to photographers at home and abroad. The lecturette may be on any subject, the lantern slides not to exceed twenty-five, and the descriptive matter to be limited to not more than twenty minutes in delivery. One of the awards in this class went to a member of a society in Perthshire last year.

THE "CASTLE" PLATE ON THE SOUTH AFRICAN BATTLEFIELDS.—One of the photographic gifts sent to Dr. John Hall-Edwards, who has been engaged in radiographic work at the military hospitals in South Africa, was a consignment of Messrs. Mawson & Swan's plates. In a recent letter to Messrs. Mawson & Swan Dr. Hall-Edwards writes: "Your splendid gift of plates arrived in splendid condition, and I have done some excellent work with them. I am using your 'Castle' almost exclusively for my X-ray work, and find it to act as perfectly here as at home."

WE are sorry to learn of the death of Mr. H. E. Farmer, one of the Vice-Presidents of the South London Photographic Society, which took place on the 10th instant, in the thirty-eighth year of his age. For a period of about eight or nine years he had suffered from consumption, and at Easter complications set in. At the formation of the Society he became a member of the Committee, and remained in that position until the state of his health obliged him to remove from London. He was a frequent exhibitor of architectural work and lantern slides, and was the recipient of many medals at home and abroad. Mr. Farmer, who was highly esteemed by a large circle of friends, leaves a widow and three children.

BRITISH ENTERPRISE.—It is extremely interesting to note that our genuine British firms can compete with their American brothers in the matter of smartness when they become determined to do so. The enterprising firm of Messrs. R. & J. Beck (Limited), of 68, Cornhill, E.C., sent one of their operators to photograph the crowd in front of the Mansion House celebrating the relief of Mafeking at 11 o'clock last Saturday morning, and at 12.15 the same morning this firm showed a print from the negative in their window. Also this same firm showed two 30 x 20 enlargements, and one 20 x 16 enlargement (from negatives taken at different times on Mafeking Day) at two p.m. on Monday. These attracted universal attention and admiration, the work being of the usual high standard of this well-known firm. We understand that the largest enlargements are from negatives taken with the new Beck-Steinheil lens, and it gives us very much pleasure to commend Messrs. Beck for their promptness and enterprise.

THE FORTHCOMING ECLIPSE.—A Reuter's telegram from Madrid, of the 18th instant, says that Sir Howard Grubb has arrived at Plasencia to observe the impending eclipse of the sun on behalf of the Royal Dublin Society, of which, it is well known, he is the Vice-President. Another telegram from Santa-Pola, in the province of Alicante, states that the English and Scotch astronomers have arrived there. The eclipse on the 28th, only partial in this country, begins at an early hour in the afternoon, so that the viewing of it does not entail sitting up, or rising, to some, at "unearthly hours." The eclipse here is only partial, but it is a *good* partial, and we have little doubt that, even here, there will be a goodly number of cameras brought to bear upon it. To secure photographs of it, lenses of long foci should be used, and it may be borne in mind that all combinations, if one of its components only

are used, has its focus about doubled. Thus a rapid rectilinear of ten inches focus will become a lens of about twenty inches focus, and yield an image approximately double the size that it will if the instrument be used intact.

SIR WILLIAM ABNEY ON MODERN SCIENTIFIC INSTRUCTION.—At the Annual Dinner of the Pharmaceutical Society Mr. Michael Carteighe proposed the toast of "Science," which, he said, might be regarded from two main points of view, first, the enormous strides which it had made during the Victorian era; and, secondly, the effect of scientific teaching in connexion with education. In his early days the teaching of science was hardly contemplated, and was certainly not recognised as a method of intellectual training; but the men who fought for it, such as Huxley, Tyndall, and Herbert Spencer, and those who gathered round them, were ultimately successful, and science was now recognised by the two old Universities, and long before was recognised by the Scottish Universities, as a proper method of culture. The idea which was current for some time, that examinations would do everything, was falling into disfavour, and the proper teaching of science was being greatly developed. He had the greatest pleasure in associating with the toast the name of Sir William Abney, the head of the Science and Art Branch of the Government and the Controller of the General Elementary Education and Science throughout the country. He was not only a man of science, but an experimental philosopher of the highest type, and distinguished for his researches in various branches of physics. Sir William Abney, in reply, after thanking Mr. Carteighe for what he had said of himself personally, said that this toast really was unnecessary, as it was implicitly contained in the three previous ones, though he must admit that a little more science in Parliament would be welcome. It was with the greatest satisfaction that he found that scientific instruction was increasing so largely throughout the country. When he first had to do with scientific instruction under State control, he found that all the laboratories he could muster up for the instruction of the poorer classes could be counted on one hand; at the present time there were nearly 700 scattered throughout the kingdom, giving instruction to between 18,000 and 20,000 students. That was something to boast of in fifteen years, and, although Parliament did not quite understand all scientific subjects, it was always ready to vote money for the purpose. Science was not out of place even in military matters, and was very useful, and had proved as useful in South Africa as the dogged perseverance and bravery of our soldiers, and it was also capable of revealing facts hitherto undreamt of in the realms of industry and commerce.

Commercial Intelligence.

WE understand that Kodak (Limited) have opened a wholesale distributing dépôt, with a retail shop, at 96, Bold-street, Liverpool, and they will open a similar warehouse and shop at 72, Buchanan-street, Glasgow. The Liverpool dépôt will ensure the more prompt supply of Kodak goods to the trade in the north-west provinces, and Glasgow will serve the same purpose to such dealers in Scotland as wish to take advantage of the centre. Statements which have been made as to further extensions in the United Kingdom out of London are entirely without foundation.

AN OLD-ESTABLISHED RESIDUE BUSINESS.—After being established for a period of over fifty years, the business of J., J. J., & T. G. Blundell has recently been removed from No. 162 to No. 199, Wardour-street, London, W. This removal has given opportunity for the erection of premises specially designed for the varied purposes of the business. To our readers Messrs. Blundell will be particularly known for the speciality which they make of dealing with gold and silver residues, in which connexion they have been so long and favourably appreciated by a world-wide circle of clients. The premises are large, light, and lofty, and the furnace-room is a model of completeness and efficiency. For obvious reasons, the business of residue reduction is not so extensive as formerly, but the firm of Messrs. Blundell is perfectly equipped to meet all the requirements of modern photographers in this regard. The supply of nitrate of silver and chloride of gold are also among the departments of the business.

In last week's JOURNAL we printed a report relating to an application made at the Dorchester Bankruptcy Court for his discharge from bankruptcy by Mr. A. H. Cox, photographer, Weymouth. The report which reached us from a press agency originally appeared in a Dorset newspaper. From correspondence that has been addressed to us it appears that Mr. A. H. Cox, the gentleman above referred to, was incorrectly described as a photographer in the reports, the fact being that he is, or was, a tobacconist, and has never been in business as a photographer. It further appears that at Weymouth there is a photographer named Mr. Walter G. Cox, of 3, St. Mary-street, who has been in business for the last twenty years, and is well known in England and abroad. We very much regret if any annoyance has been caused to Mr. Walter G. Cox (who has never been bankrupt) by our publication of a report incorrectly describing Mr. A. H. Cox, tobacconist, as a photographer, and trust that the publicity we are giving to this explanation of the matter will remove any misconception of which he may have been made the object.

THE WARWICK COMPETITIONS.—The following is the list of awards of the Warwick Competition for May:—10*l.* prize, Mr. Alfred Shaw, Photographic Dealer, Ashton-under-Lyne, *Cows in River Stour*; 5*l.* prize, Mr. C. T. Holland, 2A, Princes-road, Liverpool, *Radiograph of Boy's Hand*; 1*l.* prizes, Mr. W. Arkless, Victoria-road Studio, Bensham, *Landscape with Clouds*; Mr. E. G. Ballard, Photographer, Welsh-street, Chepstow, *Bromide Print of Baby*; Mr. A. M. Bosdet, Dowsett-avenue, Southend-on-Sea, *Carved Oak Porch*; Mr. W. Bridgford, Windsor-road, Rathmines, Dublin, *Snap-shots of Queen's Procession*; Mrs. Broughton, 4, Embankment, Bedford, *An Old Font*; Mr. W. G. Buchanan, 17, Sandyford-place, Glasgow, *A Misty Morn*; Rev. E. T. Clark, Brunswick-road, Gloucester, *Monks' Washing Place*; Mr.

F. Crew, Lyncroft-mansions, Finchley-road, N.W., *Golder's Hill, Hampstead*; Mr. N. Fordham, 4, Foster-lane, Cheapside, E.C., *A Study of Cattle*; Miss L. Harvey, Duddington-avenue, Smithdown-road, Liverpool, *White Clematis*; Mr. John Hummel, 88, Salcott-road, Wandsworth Common, S.W., *Departing Winter*; Mr. A. J. Keith, Courtlands, Ealing, W., *Laddie*; Mr. H. M. Lomas, 3, Selborne-villas, Minehead, *Going to the Meet*; Mr. H. V. Mitchell, 17, Brunswick-street, Cheetham, Manchester, *Marble Reredos*; Mr. S. Yates Omerod, 64, Forest-road, Southport, *Interior of Old Church*; Mr. E. A. Russell, Southgate College, New Southgate, N., *Rock a Nore, No. 1*; Mr. J. Spavin, Photographer, New Brumby, via Doncaster, *Avenue of Trees*; Mr. C. J. Thompson, Warren Bank, Brampton, Cumberland, *Rural Scene*; Mr. A. Waterall, Brighton Grove, Flixton, Manchester, *Watching for Daddy*; Mr. J. A. Wilson, 53, Kenilworth-road, Egremont, Liverpool, *Pals*.

THE THORNTON FILM COMPANY, LIMITED.—The first meeting of the shareholders of this Company was held on Tuesday, May 15, at the Victoria Hotel, Manchester, Mr. J. E. Thornton in the chair. The Chairman reported that the shares of the Company had been considerably over-subscribed, although the issue had not been publicly announced. A suitable building for the works had been secured at Altringham, and its equipment with the special machinery required was now almost completed. Although the Company had only been formed four months, their preparations for manufacturing were so advanced that they would be turning out their films for the market almost immediately. Dealing with the prospects of the Company, Mr. Thornton stated that the Company's films would be as easy to use as glass plates, and would be sold at a similar price. They were very much lighter in weight than plates, this being a distinct advantage where a large supply had to be carried, for example, in outdoor work. The development of the film would be as easy as the development of a plate. The transparent backing of the new film was designed both as a support for the film when in use and to prevent its curling up during development. It admitted of the progress of development and density being easily seen when held up to the ruby light, and could be readily removed from the film when dry. Satisfactory arrangements had been made for bringing the merits of the film before the notice of all prospective users. In reply to inquiries by several shareholders, Mr. Thornton explained that there had already been an enormous number of applications for the new film, both from photographers and dealers, at home and abroad. Mr. E. H. Williams, of Bolton, stated that he had been over the factory, and was much impressed with all he saw. He thought the Company had a capital factory, thoroughly up to date and splendidly equipped, with everything of the newest and best. Captain Williams, of Southport, thought that there would be a good market for the new film for cinematograph work, on account of its non-inflammable nature. Mr. J. H. Boydell, of Manchester, wished to express his pleasure and surprise to find on visiting the factory a few days ago that it was almost ready for work. From what he saw there, and his general business experience, he could say that great ability had been shown by some one in the mechanical and chemical arrangements for manufacturing the film. Mr. Rothwell, the Technical Manager, reported that, in spite of the difficulty experienced in obtaining machinery and plant, owing to the brisk state of trade in engineering businesses, the equipment of their works would be entirely completed by Whitsuntide, when they expected to be in full running order for turning out the film for sale. Mr. Slater, of Southport, moved a vote of thanks to the Chairman for presiding and congratulated the Company on the progress made with its arrangements, which was seconded by Mr. Boydell and carried unanimously.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
28.....	Bradford Photo. Society	Exhibition of Members' Work.
28.....	Southampton	<i>Faking Negatives.</i> Max Mills, sen.
28-31	Southport	Exhibition of Members' Work.
29.....	Bootle	Prize Slides.
29.....	Darwen	Excursion: Chatsworth and Matlock.
29.....	Hackney.....	Developers. W. F. Fenton-Jones.
29	Royal Photographic Society ..	{ Opening by Dr. P. H. Emerson of an { Exhibition of his Works.
31.....	London and Provincial	{ A Few Notes on Photographic Optics. { J. W. Hodges.
June.		
1.....	Southsea	Paper: Portraiture.
2-5.....	Liverpool Amateur.....	{ Excursion: Eve-ham and District. { Leader, C. F. Depree.
2-4.....	South London	{ Excursion: Tunbridge Wells. Leader, { Messrs. Rogers and Slater.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 22.—Technical Meeting,—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

Mr. ALFRED WATKINS sent a note on the subject of

HYDROQUINONE AND COLOUR IMPRESSIONS.

At the Technical Meeting in March last, Mr. Watkins read a paper entitled "Some Developers Compared," and, in the discussion which followed, a reference was made to statements by Mr. Ives and others to the effect that hydroquinone showed a reluctance to bring out the red impressions, and that for that reason it should not be employed for developing three-colour negatives, but that metol did not share this defect. Mr. Watkins thought that, if this observation was correct, it was an exceedingly interesting point that one developer should be able to differentiate between the light impressions formed by different colours, and he had therefore made some experiments the results of which were detailed in the present communication. A

Lumière panchromatic plate was exposed in different parts through three screens—blue, green, and red, for the relative times which previous trials had shown to be necessary to give equal light impressions. On development with metol, without bromide, the red, green, and blue strips appeared simultaneously in eighteen seconds; with hydroquinone development the same result occurred in seventy-five seconds, and with a mixture of metol and hydroquinone all appeared in twenty-four seconds, there being no lagging of the red impression with hydroquinone. Cadett spectrum plates, exposed through the three screens in the Hurter & Driffield exposing apparatus, did not show that hydroquinone failed to do justice to the lower tones of the red exposure, and a successful attempt with the same plates to obtain speed readings through the red and blue screens by daylight also showed that the red tones did not lag. Both with metol and hydroquinone the red impression gave a steeper gradation than the blue, both being developed for the same period, a fact which threw a doubt upon the usual presumption that all three-colour records must be developed for the same time to secure the same gradation in each. Mr. Watkins came to the conclusion that Mr. Ives had drawn wrong deductions from his observations. A weak tone appeared to lag behind with hydroquinone, but not with metol. It was probable that Mr. Ives's observation of the red tones lagging behind when the hydroquinone developer was employed arose from the fact that they were weak tones, not because they were red, and that, if the red tone had been strong, he would have found that the blue appeared to lag.

Mr. SANGER SHEPHERD explained some experiments which were made in connexion with the Cadett Spectrum plate. When developing with metol it was found that the images of four colour patches—red, green, blue, and white—all came up equal in density and in the same time; but, with a hydroquinone developer, the blue appeared first, and the red came up about half a minute afterwards; if development was continued for about two minutes, and the negative fixed, the red (which appeared far lighter than the blue) was really more dense than the blue which appeared before it.

Mr. C. J. THOMPSON, who had recently been travelling in Russia, said that the Czar was devoting a great deal of attention, to three-colour photography, and was personally making some investigations upon the subject, the results of which he (the speaker) hoped to be able to ascertain and communicate to the Society.

Mr. SANGER SHEPHERD added that, as the result of long experience in practical three-colour work, he was of opinion that metol had a very great advantage over hydroquinone; with it one could govern the density of the negative by the time of development, but with hydroquinone the tones would differ according to the duration of development.

Mr. T. E. FRESHWATER said he had not made many experiments in this direction, but those he had made had been with the pyro-soda developer, and the density under the red and blue screens appeared to be relatively equal.

Mr. SANGER SHEPHERD said hydroquinone was exceedingly useful for black-and-white work, but the quality that made it so valuable in that case unfitted it for three-colour work, where it was necessary to obtain every range of gradation with very little density. Metol, and similar developers, gave beautiful negatives, full of gradation, and without the objectionable blocking up of the whites. Blue and red both gave the same gradation.

The CHAIRMAN said that, as stated in his recent paper read before the Society, he got a difference in almost all cases, and the experience of Sir W. Abney and Mr. Watkins was the same. He thought Mr. Shepherd must have been using plates of an exceptional character.

Mr. SHEPHERD replied that the Spectrum plate was exceptional in character, and he attributed his results to its very high speed.

IMPROVEMENTS IN CAMERAS.

Mr. AGAR BAUGH exhibited two cameras in which he had had certain improvements made, especially with regard to their use with a variety of lenses, the extent of rising front and swinging back, and their extension for tele-photography. He also referred to the method of focussing with tele-photo lenses, and strongly advocated the use of a telescope for the purpose of detecting the presence of mist or moving objects, invisible to the eye, which would interfere with the sharpness of the picture.

COMING EVENTS.

The Exhibition of pictures by Mr. F. H. Evans closes to-morrow (Saturday). On Tuesday next, May 29, Dr. P. H. Emerson will open an exhibition of his works, and will deliver an address; and, at the Ordinary Meeting on June 12, Mr. H. L. Aldis, B.A., will read a paper on "The Construction of Photographic Objectives: Mathematical Investigation."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 17.—Mr. R. P. Drage in the chair.

Mr. PHILIP EVERITT showed a new form of plate-carrier or sheath that has been just brought out by Newman & Guardia. It is made in one piece, two edges being turned over on the back and stamped with a ridge to give greater stability to the whole. It was, he considered, a great improvement and a neat piece of workmanship.

The CHAIRMAN reviewed the particulars of the recent arrest of a photographer, near one of the fortified towns in France, on a charge of spying, and expressed his surprise that there were still so many people who so inadvertently photographed in the vicinity of military posts.

Some discussion took place on the announcement of a new platinotype paper with which no calcium was wanted, or any special precautions in the matter of storage. Its supposed similarity to the old Pizzighelli paper was also referred to.

Mr. A. HADDON showed the results of some experiments he had been making with some samples of collodio-chloride self-toning paper, some very bad prints upon which had been shown at a previous meeting. He showed a print fixed according to the instructions issued by the makers, which was in a very blotchy state. His experiments went to show that the fault would be eliminated, however, and that the instructions were inadequate to the successful working of the paper. Further prints were passed round, which had

been subjected to a treatment particulars of which Mr. Haddon reserves for the present, showing a practically complete removal of the bad tendencies of the paper which arose in the substratum.

KEEPING QUALITIES OF FILMS.

The CHAIRMAN, in answer to an inquiry, repeated some of his former experiences with films in hot climates, such as one had to go through in a tour round the world. He found that in such cases the latent image was practically falling off from the moment after exposure. Films that would keep a long time before exposure soon began to deteriorate in the sense that the light effects did not last, although he had found that, given a sufficiently long time after exposure, the film could be again exposed without much fear of the former image asserting itself. The emulsion, it would thus appear, was still good, but its power to retain the latent image was very slight. Under similar circumstances, he should certainly develop films within a short time of their exposure.

Mr. A. HADDON reminded the members of the difference between cut films and rollable films. The former were sliced from a block, and the latter coated on glass. Much trouble arose from imperfect washing of the pyroxyline. Some time back he went through a smokeless-powder factory. Smokeless powder was made from sawdust, which, after being nitrated, takes a fortnight to wash, and during that time it is washed continuously with hot water and cold water again and again. The whole object of the treatment is to get rid of the merest trace of acid, which would be fatal to the success of after-processes. He was quite sure that no user of pyroxyline for photographic film purposes went to this trouble, it was too expensive, and the chief trouble with cut films was due to the presence of this acid and the decomposition it set up. Cotton-wool used for making the pyroxyline consisted really of a series of minute tubes, and the amount of washing required to clear these of the acid was immense. In the rollable film, where, of course, the same state of things might originally exist, the solvents used tend themselves to remove by decomposition that which, left in the other film, causes its early deterioration.

Croydon Camera Club.—All amateurs, and most professionals, have, at one or another time, been plagued by photographs lacking in half-tone. Especially is this liable with interiors, such as include brightly lit windows. A new ingredient to be added to the ordinary developer has been discovered by Mr. BEN E EDWARDS, who on Wednesday, the 16th inst., explained how this latest addition to the photographer's collection of chemicals is advantageously usable in the making up of developer designed to reduce contrast. Introducing Mr. Edwards, the PRESIDENT stated that every addition to the power of controlling or varying the result of an exposure by altering the scale of gradation in a negative was a great gain to the art side of photographic procedure. Further, he was disposed to welcome every fresh complication or specialisation in photographic practice. Of late years photography had been inclined to become cheap and nasty—easy and profitless. By making it less so it would be the more worth while for clever people to devote their best attention to the calling. Mr. EDWARDS handed round a large number of negatives and prints in pairs, in which one of the pair was developed with the normal amount of bromide, while the other had the bromide replaced by about $\frac{1}{2}$ drachm per ounce of a ten per cent. solution of boro-tartrate of potassium. The boro-tartrate seems to act as a retarder of the chemical action set up by the reducer, but, instead of checking a deposit in the shadows and lighter half-tones, it appears able to stop an excessive deposit in the high lights. Hence, although, like bromide of potassium, it slows down a developer, it does not induce hardness, but rather the reverse. Whether the resulting negative would materially differ from one in which an unrestrained reducer was used no visible evidence was adduced. However, in cases of bright windows and deep shadows, as found in interiors, probably a restrainer of some sort is a *sine-quanon*, in which case there seems no room to doubt but that Mr. Ben E. Edwards's discovery is of distinct value. A considerable amount of discussion ensued upon the subject of the lecture, and on the use of restrainers generally. Mr. SALT contended that bromide only shortened the scale in the earlier stages of development, and was, at any rate, useful in keeping down general fog. Mr. WRATTEN considered that the leaving out of bromide from the developer was a passing fad, and that there was no good reason shown for doing without it, it was a convenience in controlling development and checking fog. Mr. WILLCOCKS stated that he never used any restrainer, most of his exposures being very full ones. He had never found any need for a restrainer. In answer to the President, he stated that his practice was confined to the use of medium rapidity plates. With a "fast" plate he should think a restrainer needless. Mr. SCHÄER stated that he had used the Cadett lightning plate without a restrainer, and found no ill effects follow; but he did not state whether in any case over-exposure had to be reckoned with. Other members having taken part in the talk, at the instance of the PRESIDENT, who said the Club was much honoured by their fellow-member having made what was apparently an important contribution to photographic knowledge, a hearty vote of thanks was accorded to Mr. Ben E. Edwards.

Hackney Photographic Society.—At the meeting on the 15th inst., Mr. T. BOLAS gave a lecture and demonstration on

GLASS-BLOWING.

Mr. Bolas dealt with his subject in a most thorough way, and showed a number of beautiful experiments. Among other things he described the various kinds and methods of manufacture of the glasses used for light filters in photography.

Redhill and District Camera Club.—The winter session of the Redhill and District Camera Club was brought to a close on Tuesday, May 15, when Mr. T. PERCIVAL PADWICK gave a lecture and demonstration on

THE INTENSIFICATION AND IMPROVEMENT OF NEGATIVES.

Mr. William Brooks, the President, was to have given a lecture on this subject, but was too unwell to attend. General regret was expressed by the members at the continued indisposition of the President. Mr. PADWICK

demonstrated and described various methods of intensification and of reduction, both general and local. Mr. HENRY SPEYER gave some practical hints on retouching, and on local reduction by the aid of methylated spirits of wine. He also showed a remarkably fine photograph of an approaching storm on the Alps, taken under most trying circumstances, for so great was the force of the wind that, in the very act of making the exposure, Mr. Speyer and his camera were blown to the ground.

FORTHCOMING EXHIBITIONS.

- 1900.
- May 25 Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 5, Clarendon-place, The Hoe, Plymouth.
 - July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.
 - August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
 - October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
 - November 12-17 Ashton-under-Lyne.
 - " 21-23 Hackney Photographic Society.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between May 7 and May 12, 1900:—

- CAMERA.—No. 8615. "The Williams Double-action Camera." A. H. WILLIAMS.
- PANORAMIC CAMERAS.—No. 8674. "Photographic Apparatus for Taking Panoramic Views." Communicated by A. Luino & Co. O. IMRAY.
- BACKGROUNDS.—No. 8810. "Improvements in Photographic Backgrounds." J. MARTYN.
- DARK SLIDES.—No. 8815. "Improvements in Photographic Dark Slides or Plate-holders." W. F. GILES and F. P. WHITEHEAD.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

DARK ROOM IN PARIS.

To the Editors.

GENTLEMEN,—It may interest your readers to know that I have induced the proprietor of this hotel to arrange a dark room for the free use of visitors. There is an ample and constant supply of water and a sink, and so arranged that all ordinary photographic operations may be conducted. Many hotel keepers provide cycle accommodation, but are in ignorance of the importance of a well-arranged dark chamber. The usual excuse is, "Oh, they only want to change plates." I notice Mr. York hard at work in the Exhibition, and, doubtless, he will have a good set of negatives. At present I am resting after my winter campaign.—I am, yours, &c., A. L. HENDERSON.

Hôtel Britannique, 20, Avenue Victoria, Paris, May 19, 1900.

WATKINS STANDARD EXPOSURE METER.

To the Editors.

GENTLEMEN,—In your very appreciative notice of the new pattern, you inadvertently convey the impression that five pointers have to be moved. There are only three pointers (for plate, diaphragm, and light) to be set before the final pointer indicates the exposure. The two extra scales for subject and copying are ready to hand when wanted, but have no pointers, and are passed over for all ordinary work.—I am, yours, &c.,

ALFRED WATKINS.

ENGLISH VERSUS FOREIGN PHOTOGRAPHIC ART.

To the Editors.

GENTLEMEN,—I am writing to you as I see articles speaking about a probable invasion by the French, but what about the actual invasion in an art sense that I see everywhere I go, offering to make portraits for nothing—at any rate, getting people, if possible, to send to a foreign country away from English jurisdiction? We have in trade, as in everything else, to compete, and are the foreigners going to beat us in quality, correctness, and cheapness, and so take the trade abroad?

It is some years ago when, at the Art Schools of South Kensington, one of the masters there told me, in speaking of a pupil who neglected the antique and was painting from life, that we should never hear of him again. Now, what has that to do with the above? I will tell you. Last summer I was away in the country, and I set to work to read again Flaxman's lectures to the Royal Academy on sculpture, and in one of them he says: "When we look upon the ancient Egyptian sculpture, stiff in form, lacking in perspective and drawing, and far from what was obtained at a much later date, yet it had thus one element of perfection—that the statues were invariably seven heads in height; that seems to have been one of the first correct standards of the human form." Now, we are told nothing happens by chance; all is corrected by measure, and the antique Greco-Roman sculptures are used at the Royal Academy's Art Schools (where I was seven years a student). South Kensington Art Schools use those works to teach students the further and more perfect development of the human form which centuries have pronounced perfect. Now I set to work to follow out the principle of proportion; and if you follow out, as I enclose, you will find drawings can now be made without much mental effort with a rapidity and correctness and truthfulness of proportion that I think may go far to beat Mr. Foreigner on his own ground. I invite you to call on me and let you see for yourself, and others, what may be unknown to many: quicker, cheaper, and better than enlargements, using them as an aid occasionally rather than a basis, my life-size heads costing in time, ten minutes.—I am, yours, &c.,

86, Warwick-street, Belgravia, S.W., May 16, 1900. JOHN BOOL.

[Perhaps some of our readers may be interested in Mr. Bool's theories, and will feel disposed to avail themselves of the invitation contained in his letter.—EDS.]

THE STEINHEIL LENSES.

To the Editors.

GENTLEMEN,—The letter of Messrs. R. & J. Beck, in your issue of the 18th inst., forces me to obtrude upon you and your readers a reply.

Messrs. Beck's statement reads thus: "In your issue of April 27, you inserted a note to the effect that Mr. Arthur Rayment was English agent for Messrs. Steinheil's famous lenses. We wish to point out that our firm have the sole British licence for these lenses."

"The arrangement with Mr. Rayment was due to a misunderstanding. We beg to say, on Dr. Steinheil's authority, that it will be immediately cancelled."

I find in your issue of May 4 (not April 27) a notice to the effect that I am (not that I was) agent for the United Kingdom for the celebrated firm of Steinheil Fils of Paris (Munich being added in error).

In confirmation of your statement I hold a document signed by Messrs. Steinheil Fils of Paris. This document cannot be regarded by Messrs. Steinheil Fils as a misunderstanding, since it arose out of their invitation, and two months elapsed between their invitation to me and the exchange of signed documents, wherein a definite term is set forth as the minimum life of the agency. I cannot, therefore, understand Messrs. Beck's assertion that it will be immediately cancelled, i.e., unless by my consent, which up to this moment, I have not given. Permit me to point out, for Messrs. R. & J. Beck's information, that the agency conferred upon me cannot affect their interests since the lenses, &c., which I offer are manufactured by Steinheil Fils in their own workshops. Obviously, they cannot be confused with the lenses of Messrs. Beck, which, according to their catalogue, are not made by Steinheil Fils at all, but by themselves at their factory in Holloway and upon which they have acquired a licence to engrave the name of Steinheil coupled with their own, and which they issue under the style Beck-Steinheil. Much regretting to trespass thus upon your space, I am, yours, &c., ARTHUR RAYMENT.

125, Earlham-grove, Forest Gate, May 21, 1900.

A PROGRESSIVE PHOTOGRAPHIC SOCIETY.

To the Editors.

GENTLEMEN,—Herewith I have pleasure in sending you our summer programme of arrangements. You will notice I have at length been successful in forming a ladies' section, which promises to be a great success. A special course of lectures has been arranged for them, and on the first excursion last Wednesday to Liphook they turned up in force. A very enjoyable day was spent, and many excellent photographs taken, the tea, of course, being quite the feature of the day's outing.

This year promises to be the most successful in the annals of the

Society. The membership is steadily on the increase; the expenses are kept down; there is a good balance in hand and no debts, and I hope to be able to record further progress in time.—I am yours, &c.

F. J. MORTIMER, Hon. Sec.

Southsea Amateur Photographic Society, 10, Ordnance-row, Portsea.

UNDER-CUT PHOTOGRAPHIC GLASS AND EXTRA FULL-CUT PRINTING FRAMES.—THE RESULT!

To the Editors.

GENTLEMEN.—I, too, like Mr. Hume in his letter to you last week, would insist that photo dry plates should not be cut smaller than their normal size. Then add to this the fact that our printing frames are all extra full made to their respective sizes. With these combined errors our negatives are often too small to catch the frames all round, and so with careless or rash printers a plate is not seldom broken while being pressed out of part of the frame. In this way we have lost many valuable negatives, the subjects of which were hundreds of miles from us, and, in many cases, not retakable, owing to either natural or artificial alterations.—I am yours, &c.

J. P.

May 21, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

- T. Everitt Innes, 108, Wellington-road, Heaton Chapel.—Two photographs of Miss Robinson's wedding party.
- E. Binns, 69, Sadler-street, Durham.—Photograph of presentation of freedom of City of Durham to Captain Lampton.
- G. Morrison, Birr, Ireland.—Photograph of John's-place, Birr. Photograph of Cumberland-square, Birr. Photograph of Episcopal Church, Birr.

BEGINNER.—A perfectly practicable instrument.

AGREEMENT.—W. The agreement is of no good as it is. It must be stamped. The cost will be sixpence only. Then it will be binding.

J. BROWNING.—Caramel may be obtained of Messrs. Litchenstein & Co., Silvertown; but the prepared backing may also be had of that firm, and of Messrs. Gear, Chidley, & Co., Great Portland-street, and other houses.

DRIED ALBUMEN.—A. C. asks: "Can you tell me how much dried albumen should be used for photo-litho transfers to be equal to the white of one egg?"—Eggs vary considerably in size. Dried albumen dissolved in six or seven times its weight of water will give a solution about the consistency of white of egg.

ILLUSTRATING CATALOGUE.—BIRMINGHAM. The best process for illustrating the catalogue, as process blocks are objected to, will be the collotype process. For the small edition required, it will not be very much more costly than if process blocks were used, because they, of the size required, would be somewhat expensive.

PHOTOGRAPHING IN THE NATIONAL GALLERY.—S. MINNS. You will not be allowed to use a camera in the National Gallery without the permission of the Trustees. This, we believe, is only granted to professional photographers who publish their work, so that the public get the benefit of the reproductions. The same regulation, we think, applies to the Tate Gallery.

AN OLD CLARENCE B.C. MAN.—1. Since its introduction commercially, about nine years ago, we have repeatedly seen the system worked, and excellent results produced by it. 2. In the first case, a lens of the anastigmatic type; in the second, one of the old rectilinear form. Write again if we can be of further help. Our recollection of your Club goes back twenty years.

LENS FOR PORTRAITURE.—A. A. A. says: "I have the offer of a No. 3 D group lens of sixteen or seventeen inches equivalent focus, cheap. Will you please tell me what length it would require for full-length cabinets and groups? also if it will be much slower than the B cabinet lenses?"—The distance required for a full-length with a lens of that focus will be about eighteen feet between camera and sitter, and for full-length groups a greater distance according to the number of figures. The D series require about four times the exposure of those of the B series when both are used with their full aperture.

THE MACAIRE FILM.—H. COLEBROOK writes: "I see in your last issue you give the specification of Macaire's photographic film. The idea seems so good, I should be much obliged if you would tell me if the film is made commercially yet, and, if so, by whom?"—In reply: The film is made commercially. If you write Mr. G. Macaire, Nightingale-road, Rickmansworth, he will probably send you a sample.

SPOTS ON PRINTS.—AJAX writes for our opinion as to the cause of spots on some enclosed prints. The (albumenised) paper is sensitised on a bath standing at about 55 grains.—We regret that, with only the strength of the silver bath to enlighten us, we can give no opinion as to the cause of the spots beyond that they are due to faulty manipulation at one stage or other, but which it is impossible to say on such meagre data.

COPYING GLASS POSITIVES.—B. & Company write: "We have a glass positive brought to us to copy and make an enlargement from, but there are no whites in it, what should be white is nearly brown. Can you give us a hint on the subject?"—If the picture will not yield a good copy in the camera, try removing the varnish from the back and using it as a negative to make a transparency on a dry plate. That is the best way to copy some glass positives.

PAINTING STUDIO.—TENANT. If the studio requires painting, and the landlord declines to have it done, we expect you will have to have it done at your expense. You want it done for your convenience or idea, and not for the landlord's. He, of course, does not care whether it is done or not, as he has no interest in the matter—whether it is shabby or not. If there was an agreement that the landlord should have the studio painted, &c., at periodical times, the case would be different.

BROWN TINTS ON P.O.P.—P.O.P. asks: "Can you tell me how to avoid a brown tint in the whites of P.O.P. prints? I have used the ordinary sulphocyanide bath and the formalin toning bath recommended in the JOURNAL some months ago, but cannot avoid this trouble."—Without seeing an example of the stains we cannot offer an opinion, as there are so many causes that may conduce to degrade the whites of prints. One very prolific one is washing the prints in dishes that are not perfectly clean, imperfect fixation, contaminated water, &c.

INSOLUBLE CARBON TISSUE.—CARBON asks: "How can one tell whether carbon tissue is insoluble or not until it is printed, if there is any method of doing so? I have often printed tissue and failed to obtain a picture, and this I have attributed to insolubility in the tissue?"—The solubility or otherwise of carbon tissue is easily tested. Place a piece of the suspected tissue in cold water for a few minutes, then put it into water at a temperature of from 90° to 100° F., and, if it is soluble, the coating of the paper will begin at once to dissolve.

TRANSFERRING FILMS TO COPPER.—H. J. JAMES says: "I wish to transfer films from dry plates to copper plates, but I find, when they begin to get very dry, in most cases they peel off again. Can you tell me how to make them stick to the copper? I have tried cleaning the copper with chalk and have soaked the films in methylated spirits before removing them from the dry plate and do not soak them in alum?"—We doubt if you will get the films to adhere unless you employ some adhesive as a substratum on the copper. Make the metal perfectly clean and coat it with a thin solution of gelatine, allow it to set and then float the films on to it.

DYNAMOS FOR CINEMATOGRAPHIC PROJECTIONS.—A ZASLISA asks: "What horse power is required and what sized dynamos for light to suit projections of cinematographs, and what would be the cost of dynamo, and where made?"—It will all depend upon the light required, and that is dependent upon the scale of the projection. A small screen will require far less light than a large one. Any of the electrical engineers will quote you for a dynamo and, at the same time, inform you the power that will be required to drive it. The power will, of course, be dependent upon the size of the machine. If you can get the current from the mains, you will find it far more economical than having your own electrical installation.

SPOTS ON PRINTS.—B. F. C. R. writes: "I enclose three silver prints, and should esteem it a favour if you would give me your opinion as to the cause of the spots which show after they are mounted. The silver bath is kept up to sixty, and the paper is floated for three minutes. I may say that sometimes we have a large batch of prints, and they are washed in a dish. The size of dish is twenty-four inches by fourteen, the depth of dish is only four inches. Would the cause be here?"—We can only give the same reply as that to "Ajax." The vessel in which the prints are washed seems a somewhat small one for a large batch of prints, unless they receive careful attention all the while and the water being constantly changed and the prints closely drained between each change.

COPYRIGHT.—J. H. writes: "I shall be very glad if you will kindly inform me if it is a rule for publishers who pay for the right to reproduce a copyright picture to sell duplicate blocks to other publishers without paying anything further to the holder of the copyright? A few years ago Messrs. Cassell & Co. paid me 12s. 6d. each for the right to reproduce two pictures, and I find they have supplied duplicate blocks to music-sellers, and my pictures are printed on sheet music. [Cassell & Co.] say that, when they pay for right to reproduce a picture, they have also the right to sell blocks to other firms. I feel sure this is not the rule; is it? Messrs. Cassell say they do not claim the copyright, but the right to use and sell as they like."—In reply: There is no rule in the matter. In granting the right of reproduction, you probably did not specify that it was for one issue only; hence Messrs. Cassell's action. For years we have included in our ALMANAC forms to be used in giving the right of reproduction. These were drawn up by the Photographic Copyright Union, and designed to obviate such cases as yours.

THE BRITISH

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EX CATHEDRÂ.

THE declared object of the *Ilford Every-day Book*, a copy of which has been sent to us by the Britannia Works Company, of Ilford, is to show in brief what dangers await the unwary photographer, how he may recognise them, and how avoid them in future. Were it not that many years' experience in the examination of photographic failures, and the indication of their causes, has persuaded us that a liability to mistakes in camera work besets the majority of plate-users, we should be less strongly convinced than we are of either the utility or the necessity of this book; but, in familiar language, it supplies a felt want—a want that will continue to be felt so long as photography itself relies primarily upon the exposure and development of sensitive salts in gelatine. The *Ilford Every-day Book* consists of fourteen pages of notes relating to common faults, their causes and prevention, illustrated by fifteen phototypic reproductions of negatives showing blemishes and defects of an only too familiar kind. Photographic instruction is never so certain of reaching its mark as when it is founded on the principle of parallelising bane and antidote;

and, in the case of the *Ilford Every-day Book*, the principle is carried out to perfection. Every plate-user should get a copy of this really useful book.

* * *

MR. RUDYARD KIPLING'S popular set of verses, "The Absent-minded Beggar," has been the means of raising so much money for the benefit of those who have suffered by the South African war that their faults of taste and style may well receive the forgiveness of the most hypercritical. The song reaches us this week in a very attractive form. It is set out in a sixteen-page book, printed in colours on the Orloff press, which simultaneously prints several colours, and it is illustrated by eminent artists, whose work is supplemented by pictures of the arms and flags of the three kingdoms and other national symbols. The Printing Arts Company, of Holbein House, 119–123, Shaftesbury-avenue, London, W.C., who are sending out this Royal Edition of the poem, price it at one shilling, and state that for every copy sold threepence will go into the "little tambourine" of our contemporary the *Daily Mail*. From a letter on the subject received from Mr. William H. Ward, the managing director of the Company, we gather that 100,000 copies of the book have been produced. It is very beautifully printed indeed, and, as a souvenir of the war, it will probably be valued by many to whom the ingenuity of the Orloff machine is of comparatively little account. We may say that we have seen the machine at work, and it struck us as destined to have a vast influence on the future of colour-printing—although trichromatic half-tone work offers it little or no scope.

* * *

THE Morelograph is the name given to a machine for rapidly exposing bromide paper, which has been invented by one of our professional readers, Mr. H. L. Morel, of 126 Wellbeck-terrace, Mansfield-road, Nottingham. To show what the machine will do, Mr. Morel sends us two lengths of paper bearing a considerable number of developed bromide prints; these are uniform and of good quality. From a series of illustrations that are before us it is easy to perceive the main principles of construction adopted in the machine. It is of box form, and the negative is inserted upon the uppermost

side. A roll of sensitive gelatino-bromide paper having been placed inside the box, it is engaged in a spindle controlled by an external handle, and the source of light, gas or incandescent electricity, having been adjusted perpendicularly to the negative, all that it is then necessary to do is to draw the paper forward under the negative, intermittently shielding the latter from the light, of course, and the exposed roll of paper is subsequently withdrawn from the machine for the purpose of development. In so far as we can judge from the illustrations, the machine appears to be a simple affair; and it should be found of very decided service by photographers having considerable numbers of bromide prints to produce.

* * *

THE Handbook of the Newcastle gathering of the Photographic Convention of the United Kingdom was issued to members this week, and in another part of the JOURNAL we reprint the arrangements that have been made for the meeting, which takes place from July 9 to July 14. The book has a stiff cover, the colour of the cloth suggesting khaki, and it contains several illustrations, the frontispiece, by Messrs. Wellington & Ward, being an excellent specimen of bromide printing. The obvious care taken in the compilation of the historical notes relating to Newcastle, Hexham, Durham, and Alnwick deserves special recognition. The programme, no matter in what aspect it presents itself, has an attractive appearance, and those who attend the meeting should be able to rely on passing a pleasant holiday, agreeably punctuated by photography. The best reward that could attend the efforts of the local Committee and Mr. Bridge, the general Hon. Secretary, to ensure such a desirable result would be a large gathering and a successful meeting. If our opinion is worth having on the matter, we should say that the Newcastle Convention—the last of the century—will fulfil the highest expectations in both respects.

* * *

ON more than one occasion we have adverted to the enterprise of Messrs. Underwood & Underwood, of London and New York, in quickly securing stereoscopic photographs in those parts of the world upon which the eyes of the public were for the time being riveted, [and only a month ago we gave some details of the efforts they were making to employ binocular photography at the seat of war. Now, whilst Lord Roberts's soldiers are marching across the Transvaal, and the end of the war still keeps out of sight, we are the recipients of a set of stereoscopic slides from negatives taken by Messrs. Underwood's operators on the battle-fields between December and February last, when the tide of success began to turn in favour of our arms. The set of slides numbers about seventy; they are entitled, *For Empire, Queen, and Flag*, and they are appropriately packed in a box covered with khaki. These slides do Messrs. Underwood signal credit, for we do not hesitate to say that they are [some] of the best war photographs we have seen. They illustrate most realistically many of the most striking of the earlier phases of the campaign, in some cases showing fighting actually in progress; and, when it is remembered that they have the additional feature of being stereoscopic, an idea may be formed of the immense interest attaching to them. We shall attach great interest and value to these slides, and shall be surprised if the public does not show an equal degree of appreciation.

PHOTOGRAPHIC PATENTS AND THE PATENT ACTS.

THAT photographic inventors are more or less interested in the Patent Acts is proved by the lists of applicants for patents that appear in our columns weekly. The Patent Acts have, from time to time, been amended, but they are still in a very unsatisfactory state so far as patentees are concerned. The fees are very high, and the patentee, when he has paid them, has no official guarantee that his invention is really protected. It may have been anticipated, in fact may be as old as the hills, yet the Patent Office will take the fees; they ask no questions. They do that even if other patents have, only shortly before, been granted for precisely the same thing; though, of course, a patent granted under these circumstances will be invalid, yet the Patent Office has taken the money and granted it. At present it rests entirely with the applicant for a patent to find out for himself if his invention has or has not been anticipated. The case is different in most other countries.

We are pleased to see that the Board of Trade are now taking this matter, to some extent, into consideration. It has appointed a Committee to inquire into the working of the Patent Acts with reference to the following questions: "(1) Whether any, and, if so, what, additional powers should be given to the Patent Office to (a) control, (b) impose conditions on, or (c) otherwise limit the issue of Letters Patent in respect of inventions which are obviously old, or which the information recorded in the Office shows to have been previously protected by Letters Patent in this country; (2) whether any, and, if so, what, amendments are necessary in the provisions of Section 22 of the Patents Acts of 1883; and (3) whether the period of seven months' priority allowed by Section 103 of that Act to applicants for Letters Patent under the International Convention may properly be extended, and, if so, on what conditions?" These are the points to be inquired into by the Committee. It is stated, however, that "Her Majesty's Government do not think it desirable, and do not propose, to establish any general system of examination as to the novelty of inventions in respect of which applications for Letters Patent are now made, and do not require any inquiry into any such system of examination."

It will be noticed that, whatever the report may be, the patentee will still have to take the responsibility of his invention being *really* novel, as the inquiry is to be confined only as to whether patents are to be issued for inventions which are "obviously old," or have been previously protected by Letters Patent in this country. Now, there are very many old inventions in connexion with photography that have never been the subject of patents, though they have been worked, and the details of them have been published, perhaps, several times in the journals; yet any one can now, and, it seems, will still, be able to obtain patents for them by paying the fees, though, of course, the patents would be invalid if contested. Patents are being continually taken out that are invalid, yet they prove profitable because no one cares to contest them, as it is well known that litigation in patent cases is a very costly affair. Therefore, a monopoly is sometimes secured and maintained entirely by bluff, threatened application for an injunction, an action for damages, &c. An old photographer, who is often consulted, and engaged in making searches in reference to photographic patent matters, once told us that probably seven-tenths of the patents taken within the last few years would not stand if they were contested.

In America and in Germany the case is different. In these

ountries not only are searches made in their Patent Offices, but in other directions, so as to ascertain what has really been one before. Thus, when a patent is granted, the patentee has some reasonable guarantee that it is a valid one, and one that is not likely to have to be contested, or, if it were, upset. Although a patent here is very costly—for fourteen years the fees are just upon a hundred pounds, they used to be more—no inquiry is made as to the originality of the invention for which it is granted. In America a patent for seventeen years costs less than ten pounds, and for that sum due search is made as to what has been done before, and the patentee has some assurance that the patent he obtains is one that is valid.

Here is another important difference between the Patent Acts of England and America. In this country, if the specification contains, say, ten claims and it is contested, if a single one of them proves bad, the whole patent becomes void. In America, under similar circumstances, if even nine of them were proved bad, the tenth would stand, and the patent, as regards that claim, would remain valid. It is true that here a patentee can disclaim any of the claims made in the specification; but, if the case is under litigation, the other side can oppose the disclaimer, but that again involves additional costs on both sides.

That photographic inventors are, at the present time, interested in the Patent Acts there is no question, as witness the list of applications we publish weekly. It seems now that any one who makes an improvement, perhaps only a change, in a process or in a piece of photographic apparatus, at once makes for a patent, and no one will deny that an inventor is justly entitled to profit by his invention. The Patent Office should therefore assist him in doing so by saying, to some extent at least, that he has, when he has paid for it, a reasonably valid patent.

In the early days of the art, when new and really original inventions and improvements were continually being made, the number of applications for patents for them during an entire year were often less than are now made weekly. In 1851, for example (the year that Scott Archer published the collodion process), there was but one, and that one was not for this process. In 1874 (the year that Dr. Maddox published the gelatine process) there were but fourteen applications for patents in connexion with photography, and those did not include Dr. Maddox's invention. It is noteworthy that the two most valuable processes in photography, the collodion and the gelatine processes, were not patented, but were freely given to the public by their inventors.

We are pleased to see that the Board of Trade have appointed a Committee to inquire into the working of the Patent Acts, but, at the same time, we regret that its inquiries are to be so much restricted.

Aerial Photography.—Some of the peculiar difficulties of this uncommon branch of photographic work are pointed out in the course of a short article in the *Scientific American*, which tells us that the aeronaut who secured a photograph which illustrates the article has, on several occasions, ascended in a balloon with his camera fully loaded with forty films, and has exposed the whole of them at varying altitudes, yet, when they were developed, they were found to be absolutely useless. The atmosphere, adds the writer, plays an important part in the success of an aerial photograph. At an altitude of 300 feet a magnificent result may be obtained. You ascend another 100 feet, and expose a second plate, exactly under the same conditions regarding speed, light, etc., as the first, yet the plate ultimately turns out

a dismal failure. The exposure proves to be many seconds too short, and the picture is scarcely visible. But ascend another 200 or 300 feet, expose again, and you get a result equal in every respect to that obtained at an altitude of 300 feet. There seems to be a thin, filmy cloud (not of vapour) that floats above the earth, which appears to have a non-actinic effect upon the plate, and therefore it is under-exposed. This phenomenon is apparent to the naked eye.

The Indian Society's Journal.—The last two or three numbers of the *Journal of the Photographic Society of India* show such marked improvement in the nature of their contents that we are glad of the opportunity of congratulating the new editor upon the changes he has made in his paper. As it was formerly conducted, the *Journal* contained, perhaps, too large a proportion of matter having a purely topographical interest. We imagine that in the new arrangement this element will not be so prominent, and that greater insistence will be placed upon information designed to be of service to practical photographers. The new editor chats pleasantly with his readers, and gives them two or three useful articles on subjects of current interest. "What they say in England," "Our London Letter," "Foreign Notes and Notions," "New Lamps for Old" and "Entre Nous" are headings which clearly convey an idea of what is printed below. The "pictorial policy" of the Indian *Journal* appears to have been sought in the "mud-flat school," which our contemporary may be interested to know, commands little or no notice nowadays in England. With the exception of this and some other solecisms concerning pictorial photography, which would cause many of our readers to smile, the Indian *Journal* is well up to date, bright, lively, and useful.

Zomo.—We had a visit this week from Mr. Mark Blow of the Crown Studios, Sydney, New South Wales, who, besides being a photographer, is opening a business as a wholesale dealer in photographic goods. Sydney appears to be conspicuous for the severity of its competition in portrait photography; but it is described to us as an excellent centre for the business of supplying amateurs with their photographic requirements. The term "Zomo" which appears at the beginning of this paragraph has been applied to a printing process adopted by Mr. Blow for portrait purposes, and some of the results were submitted to us for our inspection. They resemble smooth-surfaced bromide prints with rich black shadows, delicate half-tones and soft lights; but the process does not rely upon silver for the sensitive medium. From the indication given us of the method of producing these Zomo pictures we should expect them to be as permanent as a photographic print could be. And we know that in Sydney where the business methods of photographers are somewhat more dramatic than here in London—the "blessed word" permanence possesses very high significance.

DR. EMERSON AT THE ROYAL PHOTOGRAPHIC SOCIETY.

[FIRST NOTICE.]

The Exhibition of Dr. Emerson's photographs at No. 66, Russell-square, W.C., coincides with the author's removal from East Anglia, the field of so much of his literary, photographic, and natural history work. The world at this time is closing many old chapters and opening new ones. It is so with that branch of photography of which Dr. Emerson was once the chief student and exponent. Regret collides with reason as we write in the past tense, for the photographic work which Dr. Emerson put aside some ten years ago will not be taken up again, and on June 30, when the Exhibition closes and the one-hundred-and-forty photographs are taken down from the walls, they will be scattered in many directions, in all probability not to be gathered together again and publicly shown. The negatives and photogravure plates have been destroyed, so that in a very little while a direct photograph by the most intellectual figure in modern photography will be a very rare thing indeed.

The last decade of the closing year of the century has witnessed many curious happenings in photography, and especially in that section of it which we have in immediate contemplation. It has produced salons and "schools," fuzzypers, astigmatographers, Artigueites, gum-bichromate

worshippers, photo-fakers, the *f-64* man, the diffusion-of-focus man, the mud-flat person, and other phenomena. And then we have read, alas! about pictorial photography by the mile without perceiving anything but printed words in the whole mass of it. There have been forewords to catalogues, accusations of implacable hostility to pictorial photography, and angry references to a mysterious "B. J." cast of thought, of all things in the world! The comicality of these little tempests seen retrospectively is irresistible. But now at the end of all this absurd and wearisome farce-acting comes the sincere and earnest worker, to whom for his arresting thoughts and examples photographers owe so much, to show by the simplicity and truthfulness of his printed productions what is most abiding and convincing in pictorial photography.

Ten and twelve, in some cases fifteen, years have passed since Dr. Emerson produced these photographs, and to-day they teach us several lessons: One of them is that in the matter of pictorial photography we have been moving in a circle, and that, after all the varied experimentation to which we referred just now pure unfaked photography as a means of producing a truthful pictorial result, gives a photographer wonderful powers. Neither Dr. Emerson's negatives nor his prints were ever worked on, and yet in some cases the very striking contrasts of light and shade, and the delicacy of some of the finer gradations would appear to be impossible of production without careful handwork on the negative. But, no; Dr. Emerson has always taught, and followed out his own doctrine in practice, that in delicacy of rendering of certain subjects, pure photography excels painted work and other means of making pictures. And this is amply borne out in the present Exhibition.

There is no colour in these 140 photographs, the platinotypes, photogravures and carbon prints being uniformly in black pigment. It is probable that the hanging scheme chosen by Dr. Emerson will excite discussion. The walls have been covered with a yellow fabric, and the frames are of thin moulded wood coloured green, whilst mounts of a very light green tint have been chosen. In no single case has close-up framing been adopted, and, for so pointedly declining to recognise a fad which in recent years has been carried to excess, we think Dr. Emerson deserves special thanks. Who that remembers the vast expanse of stained woods of which some of the recent exhibitions in London mainly consisted can do so without feeling that they had a killing effect on many of the photographs and a most distressing effect on one's nerves? Dr. Emerson shows us that an exhibition of photographs need not be as depressing to contemplate as a suburban undertaker's window on a wet afternoon. Seen in the evening especially, the total effect of his Exhibition is bright to the eye without being violent and obtrusive, and, as you walk round the rooms and examine the photographs one by one, you are conscious that the tender scheme of mounting and framing exercises no distracting effect upon you while you are looking at them. By daylight, owing to the illumination coming in from side windows, a certain harshness and garishness is seen in parts of the Exhibition, but this is an unavoidable matter. The rooms at Russell-square fall short of the ideal gallery in which to show pictures or photographs.

But the most remarkable feature of this Exhibition, if we may make use of a convenient "bull," is what it does not contain—the "fuzzy" photographs. Of all the stupid mendacities of which Dr. Emerson was at one time made the object—and we are obliged to say that our own pages were formerly abused in this way—none clung so tenaciously to his name as that of being the inventor of "fuzzy" photography. We can even recall such a phrase as "defunct Emersonism at the Salon," as if to say that some of the foolish blurs that were shown at the latter Exhibition were the results of Dr. Emerson's example or teaching. Nothing of the sort. Fuzzy photography is not on view at Russell-square just now. In one picture only is the background designedly thrown out of focus, but of the evil thing whose only claim to notice lay in its being hopelessly blurred there is no trace. Truth to tell, some of these photographs of Dr. Emerson's would in parts do credit to a perfectly corrected anastigmat, and yet they are full of pictorial qualities.

We mentioned above that Dr. Emerson's work in East Anglia has been brought to a close. We can permit ourselves to feel some share of personal regret at the severance. It is about thirteen years since the placid natural charms of the English Holland first exerted themselves over us, and many is the hour, by night and by day, that we have passed near the dreamy broads and rivers which have given Dr. Emerson so much of his inspiration. Properly to understand and appreciate the charm, the fidelity of the work he is showing at Russell-square, you must have lived in the land and amongst the people; you must have seen the wisps of mist rising up over the bland marshes, and have listened to the incomparable music of the wind in the reeds; have sailed over the serpentine rivers, and seen the shy coot disappear at the sound of your

voice; you must have dipped deeply into that East Anglian charm life, the precise nature of which mere verbal description finds it difficult to convey.

It is this fact of our long and intimate association with the scenes Dr. Emerson's photographic work that may explain in some measure the keen admiration we feel for it, an admiration that grows with the year but, of course, the principles of pictorial photography as laid down Dr. Emerson in his writings are not to be regarded as susceptible of geographical restriction. He could just as well have translated his theories into practice in the West Highlands of Scotland, or amongst the Yorkshire dales, as in Norfolk and Suffolk; but he had to make a choice of scene, and the selection was a happy one. Some pictorial photographers have identified their work with Dedham, others with Canvey Island, Paul's Cray, Walberswick, the River Thames, and so on. Painters have done the same thing, and the humble photographer can scarcely be blamed for following so admirable a lead.

The Exhibition is to remain open until June 30, so that ample opportunities offer themselves for a visit of inspection. Next week we shall print a few detailed notes on many of the individual photographs. From a small catalogue that is issued it is apparent that nearly the whole of the photographs exist only in Dr. Emerson's books, a form in which they can scarcely be said to be so accessible to photographers as could be wished; but the greater number of those shown at Russell-square, W.C. are for sale. By the way, it is interesting to note that several of the photographs were printed in platinum fourteen years ago. Looked to-day in the bright spring daylight, they have all the bloom and richness of deposit of carefully produced prints made last week!

THE "BRITISH JOURNAL OF PHOTOGRAPHY" WAR FUND

To the total of 917. which we have received for the *Daily Telegraph* War Fund, we are this week enabled to add only the sum of 10s. from the employés of Messrs. E. S. Baker & Son, Bristol Street, Birmingham. The result, we must confess, causes us some disappointment, for we were induced to hope that the magnificent example set by Messrs. Elliott & Fry, Messrs. Dallmeyer, Mr. H. Walter Barnett, and others, would not be without an effect upon other firms equally in a position to contribute to a representative photographic War Fund, while the presence of smaller sums in the list impressed us with the belief that photographers and others all over the country would be similarly inclined to participate in the movement. What we particularly wished to print was a column or two of names with small sums, such as shillings, half-crowns, and so forth, so as to give a general idea of the amount contributed.

However, we will keep the list open a little longer, and will glad forward any sums that are sent to us to the *Daily Telegraph*. It is a melancholy thing to reflect that this week, which witnesses the ailment of the rank and file of photographic workers to help a Fund to alleviate the sufferings caused by a war which has greatly benefited photography, also sees the final extinction of the Photographers' Benevolent Association which was started many years ago to benefit photographers, so many of whom have profited by it, so few of whom, alas! have supported it. The pity of it all!

THE PHOTOGRAPHER'S YEAR.

JUNE.

"After her came jolly June, arrayed
All in green leaves, as he a player were."

MAY has not by any means proved the idyllic dream month, nor the month of flowers we had anticipated. There must have been something wrong either with the popular conception that gives it such a character, or the seasons have shifted onwards into the year, and winter lingering late delays the coming of summer. Upon first thought we are more ready to accept the latter reason, for it is a very common thing to hear people beyond middle age saying, upon a chilly day in April or May, that spring and summer are later in coming now than when they were young. There may be something in it, but it must be noted, upon the other hand, beyond the natural "praise of times that have been," that scientific observers, dealing with average results, that make but indifferently palatable reading to the majority—say that in reality June in our climate is what poets dream May to be. An agreeable outlook, now that June is with us, for we can expect a double amount of seasonal pleasures. However about the arrears of May, there is one feature about June in

ptic description that there is no need to turn to science for an endorsement of, as it is so evident to an ordinary eye every year, viz., that it is a leafy month. "Leafy June" sounds as natural as "spring cleaning," or "honest poverty." The trees are in their full wealth and glory of blossoms, and richly deserve being pictured. Still, trees as trees do not appeal to the ordinary imagination. There is a pleasure in the fulness of their presence, and a restful satisfaction to the eye in the large masses of green; but it requires something of a Ruskinite cast of soul to go further, and endow the tree with sentient life. To see in the spread and general disposition of branches and leaves a perfect arrangement for giving a due share of the necessities of light, and rain, and air to every part. An order that varies markedly in each kind of tree, but which in itself is equally effective for the purpose.

Another feature about trees that does not strike the casual observer is that of age. Unconsciously measuring by the brief span of human life, he fails to realise without an effort how long it takes forest trees to attain maturity, how long they retain their vigour, and how humanly vacuous they are in clinging to waning life. Many an old tree by the side of an important road may have looked down upon historic doings of which we only know of in the misleading patchwork of book description written long afterwards. They may have seen roistering cavaliers riding singing the music-hall ditties of the day, and sober fighting Puritans chanting psalms, archers marching to French wars, baronial retainers sent upon home forays, nay, even have cast their youthful shadows on mailed crusaders on the way to the port of embarkation for the Holy Land. And probably, nowadays, when a breeze freshens up their failing faculties, their grave head nodding may be reminiscences conjured up and discussed, or possibly the usual ones of aged doubt as to the lower order of things, the safety of a high-gearred bicycle or motor car running by, for instance.

But, if these tree suggestions are not to be gained in looking at the tree itself, they are still less likely to be in looking at its photograph. On the side of it, trees would not seem very difficult to photograph. Nor are they up to a certain point of merit, but a downright good picture of a tree is a greater rarity than one would suppose until he sets about finding it. One in which characteristic arrangement of bough and leaf is given in masses of light and shade, in which there are not over many reflections from the infinite leaf surfaces, but yet with a sufficiency of detail and crisp sparkle in the right place. It is work for early morning or late afternoon, when the light is clear. A fairly large stop, the slowest practicable date, and a quick exposure, will also be best, owing to the lower light, a need for density, and the fact that small twigs are rarely still long. But the great essential about trees in pictures is that they be in the right place. If it be too much to expect the more deeply sympathetic interest in them referred to above, they are unconsciously and universally regarded as objects heightening human interest in very many ways. There is a great difference in the view seen through a window, if there are trees in it or not; in the appearance of the house, if its immediate surroundings are bare of trees, or modified and softened by their presence. A field or lawn with a large, spreading tree in it is far more satisfying to the eye than if bare, and trees doubly improve the river bank in their actual and reflected presence. The same acknowledgment of worth is made by the more general planting of trees in towns, as the old-fashioned gardens, courts, and closes, where they once grew naturally, are eaten into by the brick-and-mortar cancer. In short, we appear to need splashes of green before we can truly thrive—a useful instinct, probably surviving from times when our ancestors lived altogether in the open, and in the midst of green.

The highest opportunity of the photographer comes in fitting the human interest with trees in his picture. So will he most effectually appeal to the feeling of instinctive fitness, and stir up interest to its best point. Spenser, in the couplet at the head of this article, expresses the same thing unconsciously by referring to

"June, arrayed
All in green leaves as he a player were."

The manner in which to do this must vary with place and taste of worker. Trees with a village church behind them, or spreading over rustic benches in front of old-fashioned taverns, look well. So they do form avenues leading up to lordly country houses, or singly, shading cattle in the park, throwing grateful shade over a resting team or gipsy van in the lane, fringing the river bank and overhanging the fishing punt. It is a true photographic question of judicious selection, for whichever may be chosen, it is certain to be appropriate, and strike an observer soothingly as such without his being able to say exactly why. If given anything of a chance, trees never make a mistake in selecting

suitable growing places. There are no square pegs in round holes. The pines, spruces, and firs keep to the bare and sterile uplands, lower down in richer soil come oak, ash, elm, and beech, and still lower in moisture bottoms the poplars, willows, and alders. Incidentally a tree may thus be used to emphasise any more far-reaching suggestion it may be desired to convey. Pictures with trees and still water in them have, further, a higher quality of lasting interest than any others. They can be looked at day after day for years without palliing upon the taste or fancy. Action, colour, glitter, arms, and soldiers possess an attraction which we feel keenly at such times as the present. They stir up the blood healthily and patriotically at critical seasons. But critical seasons, by comparison, are rare. Such appreciative violence of emotion cannot be long sustained without a break-down or safe-guarding reaction, and the most satisfactory pictures, all round, are those of quiet natural scenes and objects in middle shades and colours. A hay-laden wagon in the rickyard is a far more satisfying picture to have on the wall through twenty years than a cavalry charge, a ploughman leaning against his plough handles, than an officer, sword in hand, at the cannon's mouth.

The reference to the hay wagon leads us naturally to another characteristic feature of June that requires no recommending, viz., hay-making. He must be a very rare and peculiar individual indeed who does not find a willing pleasure in leaning over a gate to look at the hay-making in the field beyond. There is a peculiar and universally felt charm in gathering in the fruits of the earth—hay-making, corn-reaping, blackberrying, apple-gathering. Of all these hay-making is the pleasantest and most popular, both to the dweller in country and town. To the former it means evident and palpable gain, and, although it may be "more blessed to give than to receive," to the majority of us it is pleasanter, any way, to receive. With the townsman no item in the imagined prospective delights of a visit to the country figures so spontaneously as hay-making. Warmth and sunshine must be present as essentials; the grassland is easy and elastic to the tread after city pavements; the scent delicious, and the cider keeps divinely cool in its jar in the running water of the brook for the slacking of thirst with an unaccustomed Spartan twang of urgency about it. Something of added vividness, too, may be given to mental pictures of hay-making presenting themselves in after-life from the fact that the first impressions were formed in childhood, for the hay-field is emphatically the place for children. But, whatever the cause or causes, it is very clear that pictures of hay-making are very popular. Few possessors of a camera are there who have not tried their hands at it. The conditions are all favourable—good light, slow action and movement, and suitable photographable colour. Still it would be harder to find one satisfied with his result than dissatisfied. The two mistakes made as a rule are: taking the picture in the open field (where the workers naturally are most of the time), and allowing the latter to be conscious that they are being photographed. As a remedy for the first, the opportunity of taking the wagon in a corner, or, at least, with a hedge, or a tree as a background, should be carefully watched for. Better would be snapping it off as it comes through the gate into the lane; or, better still, the best spot in the lane itself should be chosen, and everything made carefully ready for releasing the shutter when wagon, team, and driver have moved on to it on their homeward journey. A load of hay with a setting of living green, horses moving slowly, and the waggoner walking alongside, are elements that, rightly handled, go to make a very effective picture. But, whether in field, lane, or home-stead, let them be taken without giving a chance for conscious arrangement. The pose of a rustic labourer need not necessarily be worse than that of one higher up the social or intellectual scale, possibly of the two it may be better, for he does not know enough to attempt too much. But, even if it were good, perfect indeed, it cannot but detract from the value of the picture in being incongruous. People do not go into hay-fields to pose.

Thus, with two readily accessible subjects, trees in full beauty and haymaking, both admitting of such wide and varied treatment, there should be no lack of characteristic material for photographing in June. Not that the choice need be limited to these, for, with everything at its very best in country and town, there is unlimited minor material of all sorts available.

TELE-PHOTOGRAPHY.

[Translated from *Die Umschau*.]

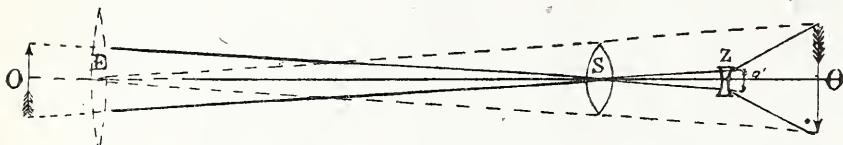
It is necessary sometimes to make photographs of considerable size of objects at a distance. It has been stated that during the war between China and Japan photographs were taken of wrecked Chinese vessels.

situate in inaccessible places, so that the effect of the artillery and torpedoes might be studied. Problems of a similar kind also presented themselves during the war between Spain and the United States, as photographs were wanted of large masses of moving troops, from a considerable distance. But we need not refer merely to the incidents of war to illustrate the importance of an instrument which permits of such photographs being obtained.

The ordinary photographic lens depicts distant objects on a scale proportional to its focal length. There would be no difficulty in photographing distant objects if lenses of suitable focus could be used. This is actually done in astronomical photography. The beautiful photographs of the moon made at the Paris and Lick Observatories were taken with lenses of ordinary construction and very long focus, exceeding, in fact, ten metres. In other words, the photographic plate was more than ten metres distant from the lens. In ordinary photographic practice such a solution of the difficulty is impossible, because insuperable obstacles stand in the way when cameras of such enormous extension are used. The problem to be solved in constructing an instrument for tele-photography is, consequently, to find the means of obtaining an image of considerable size with a camera of workable dimensions.

Such an instrument is now made by combining a collecting lens, s , with one of considerable diverging power, z , so that the distance between them upon the optical axis may be altered at will within certain limits.

If we take the collecting lens, s , alone, the distant object, o , will be represented by a small inverted image at o' . This may be seen at s under the same angle as the distant object, o . If we now interpose the diverging lens, z , as shown in the diagram, an enlarged image of o' will be formed at o'' instead of the smaller image, and this may be projected upon the ground glass. If we find the print, E , upon the axis, by means



of a simple geometrical drawing, so that o'' shall appear to be under the same angle as o' is in relation to s , the distance, $E - o''$, will represent the focal length of a simple collecting lens, which will give an image of the same size as o'' . By means of our combination we thus obtain the larger image and reduce the camera extension by the distance $s - E$.

We may here observe that the image, o'' , may be further enlarged, within certain limits, according to the relative positions of z and o'' , without unduly increasing the camera extension, $s - o''$, and this leads us to the second advantage of such a combination, which enables us to obtain, within considerable limits, an image of any desired size by means of moderate camera extension, however distant the object.

Such advantages must, however, be bought at the expense of certain disadvantages, in comparison with the lens of ordinary construction. There is a loss of rapidity, and the length of the instrument reduces the field of view to such an extent that it seldom exceeds 10° . The want of intensity is easily explained. We will assume that the collecting lens, s , requires an exposure of one second to form the image at o'' , and that the interposition of the negative lens, z , enlarges the image at o'' to six diameters. It follows that the amount of light which was concentrated to form the smaller image at o' has been spread over an area 6×6 , or thirty-six times larger, to form the image, o'' , and it is therefore necessary to multiply by thirty-six to obtain the correct exposure, which should now be more than half a minute instead of one second.

The combination of a collecting lens of long focus with a diverging lens of shorter focus is called a tele-objective in the proper sense of the term. Such an instrument was constructed by the Italian engineer, Ignazio Porro, in Paris, in 1851, and shortly afterwards recommended for photographing buildings. It was practically forgotten, but forty years afterwards it reappeared as a new invention and came to the front in the domain of photography.

If distance be an important factor, the atmosphere with us is seldom clear enough for using the tele-photo lens; but, in Italy, Professor G. Roster has taken photographs with it in which houses, seventeen kilometres distant, may be clearly seen. Other uses for the lens are to be found in the sphere of architectural photography where details of buildings can only be photographed, with an ordinary lens by erecting stages of considerable expense.

Specially constructed tele-objectives may also be used for instantaneous photographs at a distance, and these have been used for studies in

natural history. Tele-photo lenses have been little used, as yet, in portraiture, although certain advantages in perspective would be secure in consequence of the size of the image being independent of the distance of the sitter.

DR. MORITZ VON ROHR.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

FIFTEENTH ANNUAL MEETING, NEWCASTLE-ON-TYNE,
July 9 to 14, 1900.

PRESIDENT: THOMAS BEDDING, F.R.P.S.

THE meetings and exhibition of apparatus, pictures, &c., will be held in the Grand Assembly Rooms, Barras Bridge.

RECEPTION COMMITTEE.

The Right Rev. the Lord Bishop of Durham; the Right Hon. the Earl of Durham; the Right Rev. the Lord Bishop of Newcastle-upon-Tyne; the Very Rev. the Dean of Durham; the Rev. Canon Gough, D.D., Vice of Newcastle-upon-Tyne; Riley Lord, Esq.; the Sheriff of Newcastle-upon-Tyne, John J. Forster, Esq.; H. E. Armstrong, Esq.; Cuthbert Bainbridge Esq.; H. Benson, Esq., Under-Sheriff of Newcastle-upon-Tyne; Robert Blair, Esq., F.S.A.; W. D. Cruddas, Esq., M.P.; James D. Farquharson Esq., M.B., C.M.; Dr. George Foggin; J. Pattison Gibson, Esq.; William Gray, Esq., Deputy Mayor of Durham; the Rev. Principal Gurney, M.A., D.C.L.; Thomas Hodgkin, Esq., D.C.L., Litt.D.; Alexander Laing, Esq.; B. Lupton, Esq.; C. W. Mitchell, Esq.; Joseph M. Moore, Esq.; Alderman Henry Newton, M.D., J.P.; W. Parry, Esq.; J. B. Payne, Esq.; the Rev. Jevon J. M. Perry; Professor G. Hare Philipson, M.D., D.C.L.; W. R. Plummer, Esq.; Frank W. Rich, Esq.; R. Straker, Esq.; Professor Stroud, M.A., D.Sc.; J. W. Swan, Esq., M.A., F.R.S.; Aaron Watson, Esq.; Richard Welford, Esq., M.A., J.P.; Lionel Williamson, Esq.; Professor Mark R. Wright, M.A., &c.

LOCAL EXECUTIVE COMMITTEE.

Messrs. Geo. B. Bainbridge, C. E. Barkas, James Baty, J. S. B. Bell, Dr. Blacklock, W. Parker Brewis, T. Maltby Clague, Walter S. Corder, Percy Corder, W. E. Cowan, J. W. Dyson, G. Elphick, Wm. Fenwick, A. B. Gardner, Godfrey Hastings, R. O. Heslop, J. J. Kirkwood, P. M. Laws, Edgar G. Lee, William Milburn, Rev. J. W. Ogden, Frederick Park, Sydney Reid, John Scott, G. L. Snowball, C. J. Spence, John Watson, and W. C. Way.

Sunderland Society.—Messrs. W. J. Pope, W. Bartram, and C. E. Cowper.

Durham Society.—Mr. R. Hauxwell, Major E. White, and Mr. Frank Cluff.

South Shields Society.—Messrs. A. W. Hoare, J. Davenport, and M. H. Sadler.

Committee for Compiling Notes on City, &c.—Messrs. J. P. Gibson, R. O. Heslop, W. P. Brewis, and Percy Corder.

Excursion Committee.—Mr. J. J. Kirkwood, Major White, Messrs. R. Hauxwell, Walter S. Corder, C. E. Barkas, G. Elphick, and John Watson.

Local Hon. Secretary.—Mr. W. Thompson, 22, Campbell-street, Newcastle-on-Tyne.

Assistant Hon. Secretary.—Mr. Edgar G. Lee.

ARRANGEMENTS.

MONDAY, JULY 9.—For the benefit of those members of Convention who will be in Newcastle previous to, or early on Monday, members of the Newcastle Association will arrange to be at the meeting room to act as guides, and parties will, at convenient times, be conducted over the old Castle, Black Gate Museum, Cathedral, Natural History Museum, and generally inspect the most interesting features of the city.

Conversazione.—The opening *Conversazione* will take place in the Grand Assembly Rooms at 7.30, when the members will be officially welcomed to the city by the Right Worshipful the Mayor of Newcastle-on-Tyne, Riley Lord, Esq., who will be supported by an influential Reception Committee, the officers and members of the Newcastle and Northern Counties Photographic Association, and neighbouring Photographic Societies. The Convention will be declared open, and the President will deliver his address. After a short interval, there will be an Exhibition of specially selected lantern slides, followed by a collection of slides by members of the Newcastle and Northern Counties Photographic Association, illustrative of the places to be visited by the members during the meeting. Honorary Lanternist.—The Rev. J. W. Ogden.

TUESDAY, JULY 10.—*Excursion to Hexham, the Roman Wall, &c.* Leader, Mr. J. Pattison Gibson. The train will leave the Central Station 9.50, arriving at Hexham 10.45. Lunch at the Town Hall at 1.30. Trains will leave the Town Hall at 2.30. Trains from Hexham at 8.3 and 8.53, arriving at Newcastle at 8.58 and 9.35. Tickets, including, train, luncheon, brake, &c., 7s. On arriving at Hexham, the party will

be conducted to the Abbey, &c., permission to photograph inside the building having been kindly given by the Rector, the Rev. E. S. Savage. After lunch, brakes will leave as above for the pilgrimage along the Roman Wall, &c. W. D. Cruddas, Esq., M.P. for Newcastle, has kindly given permission for a limited number to visit Haughton Castle. Special tickets, to the number of sixty, will be provided for those wishing to avail themselves of this invitation, and will be distributed either by priority of application or ballot, as may be found most convenient. Those of the party who have these special tickets will drive by Hums-haugh to visit Haughton Castle. Haughton is one of the thirteenth-century Border castles, and was formerly held by the ancestors of the poet Swinburne. The remainder of the party will drive back to Hexham by way of Chollerford and St. John Lee. There will be no meeting at the Assembly Rooms on this evening.

WEDNESDAY, JULY 11.—The Annual General Meeting and election of the new Council at the Assembly Rooms at 10 o'clock. There will be a meeting of the new Council at 11 o'clock. In the afternoon there will be a reception of the members by the President of the Newcastle-upon-Tyne and Northern Counties Photographic Association, G. B. Bainbridge, Esq., at Jesmond Dene. Jesmond Dene is a pleasure ground about two miles from the city. It was formerly the town residence of Lord Armstrong, and is quite an unique spot, affording as much opportunity for pictorial photography as could be obtained by going many miles from the city. All trams marked "Jesmond" or "Osborne Road" from the Central Station or the Assembly Rooms go near the Dene. The reception will be held in the Banqueting Hall at 2 o'clock. The official group will be taken by Mr. W. Parry (of South Shields), at the old Water Mill, at the top end of the Dene, at 3 o'clock. Refreshments will be provided in the Banqueting Hall at 4.30. At the Assembly Rooms, at 7 p.m., the Annual Dinner and Smoking Concert will be held. Evening dress optional. Tickets (not including wine), 5s. 6d. Lady members are invited to be present at the dinner and concert. Mr. W. S. Corder has arranged that during the dinner a selection of typical north country and border ballads shall be played on the "Northumbrian Small Pipes."

THURSDAY, JULY 12.—*Excursion to Durham.* Leaders, Mr. Robert Hauxwell and Major E. White. The train will leave the Central Station at 9.30, arriving at Durham at 9.50. Luncheon at 1 o'clock. Train leaves Durham at 6.5, arriving at Newcastle at 6.50. Tickets (including luncheon and admission to Castle), 5s. 6d. On arrival at Durham the members will be divided into two or more parties with a leader to each, so that photographic work can be more easily accomplished. Dr. Kitchen, Dean of Durham, has kindly promised to give every facility to members for photographing the interior of the Cathedral, except during the hours of Divine service (morning, 10 to 10.40; afternoon, 4 to 4.35). N.B.—The usual Visitors' Fee of 6d each (in aid of the Restoration Fund), will be charged. Durham Castle will also, by special permission of Dr. Plummer, Master of Durham University, be available to the Members of Convention; he has also kindly granted the use of the large and splendid Banqueting Hall of the Castle for luncheon. At the Assembly Rooms, at 8 p.m. A paper on "National Photographic Records," by Sir J. Benjamin Stone, M.P., also a paper by Mr. J. Bridges Lee, M.A., on "Photogrammetric Methods as applied to Record and Survey Work," after which there will be an exhibition of specially selected lantern slides.

FRIDAY, JULY 13.—*Excursion to Alnwick, Hulme Abbey, &c.* Leader, the Rev. Jevon J. M. Perry. The train will leave the Central Station at 9.30, arriving at Alnwick at 10.39. Lunch at the White Swan Hotel at 1.30. Train leaves Alnwick at 4.10, arriving at Newcastle at 6.30. Tickets (including luncheon, brakes, &c.), 8s. On arrival at Alnwick, brakes will be waiting to take members for a drive through the Park, visiting the spot where William the Lion was taken prisoner while besieging Alnwick Castle in 1174, Brislee Tower, Seven Streams, Hulme Abbey, &c. After lunch the party will be conducted to the Castle, dairy grounds, the churches of St. Michael's and St. Paul's, &c.

At the Assembly Rooms, at 8 p.m., a paper entitled "Bubbles," by Dr. P. H. Emerson, M.A., and a paper on "Some Residues, and what to do with them," by Mr. S. B. Webber, followed by an exhibition of specially selected lantern slides.

SATURDAY, JULY 14.—Various short excursions to places of interest in and around Newcastle will be arranged to suit the requirements of the members.

GENERAL INFORMATION.

Application for membership of the Convention should be made through the Hon. Secretary, Mr. F. A. Bridge, East Lodge, Dalston-lane, London, or the Local Hon. Secretary, Mr. W. Thompson, 22, Campbell-street, Newcastle-on-Tyne. The annual subscription is 5s. The privileges of membership include invitations to the Official Receptions, admission to all the meetings, to the Exhibition of Apparatus, Pictures, &c., at the Assembly Rooms, with special rates for excursions, &c. Non-members are admitted to the Exhibition of Apparatus, Pictures, &c. (which is open each day from nine a.m. to nine p.m.) on payment of 6d.

Railway Time Tables, &c.—The times of trains for the various excursions are as nearly as can be ascertained at the date of issue of this programme. Should there be any alteration, it will be posted on the notice board, but in any case the correct time will be printed on the coupons. The Tyne Steam Shipping Company's s.e. *New Londoner* or

Tynesider leave Free Trade Wharf, Ratcliffe, London, E., and Quayside, Newcastle, every Wednesday and Saturday. Fares (single), first class, 12s.; second class, 8s. Return, 18s. and 12s. Average passage twenty-three hours. The Tyne river steamers for Shields and Tynemouth, calling at all piers, leave the landing stage every half hour. Fare to North Shields, 3d.; return, 5d.

DARK ROOMS.

The Thornton-Pickard Company have again this year very kindly promised to send a commodious portable dark room with the excursions. It will, as on previous occasions, be in charge of Mr. Hesketh, one of their representatives.

Dark Rooms in Newcastle.—Messrs. Mawson & Swan, Moseley-street; Messrs. Brady & Martin, Moseley-street; Mr. R. Clark, Moseley-street; Mr. F. Park, Collingwood-street; Messrs. Hurman, Limited, St. Nicholas Buildings; Messrs. Wilkinson & Simpson, Newgate-street; Mr. John Watson, Grainger-street; Mr. Kirkup, Westmoreland-road; Mr. Dixon, Elswick-road; Mr. A. B. Gardner, 12, Grey-street; and at the Assembly Rooms.

Hexham.—Messrs. Gibson & Sons, chemists and opticians.

Durham.—Mr. Wilkinson, photographer, end of Framwell-gate Bridge, near the Cathedral; Mr. Edis, photographer, Sadler-street, close to the Castle.

Alnwick.—Mr. Ruddock, photographer, Bondgate Within; Mr. Robson, photographer, Finkle-street; Mr. J. L. Newbegin, chemist, Narrowgate; the Rev. Jevon J. M. Perry, St. Paul's Vicarage.

HOUGHTON AND SALMON'S BACKGROUND STAND.

[Patent No. 11,043 of 1899.]

This consists of an upright rectangular frame of wood, *a*, *a* (figs. 1 and 2), of sufficient dimensions to receive the largest background that may be required.

The frame is struttured at the lower corners to ensure strength, and is furnished with cross feet, *b*, *b* (figs. 1 and 2), to which are fixed castors to enable the stand to be moved about freely. On the lower inner surfaces of the uprights of frame are fixed fillets of wood, *c*, *c* (figs. 1 and 2), to which are screwed a series of brackets, *d*, *d*, *d*, *d* (figs. 1 and 2), for the purpose of storing the pivoted rollers, *e*, *e* (figs. 1 and 2), to which the backgrounds are attached.

The uprights are slotted in their upper parts, *f* (fig. 2), to receive a

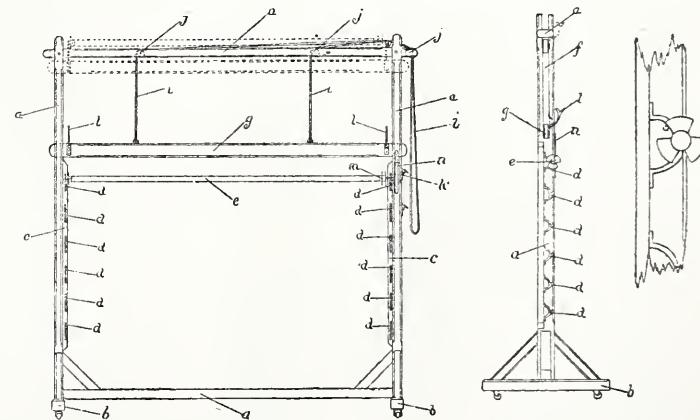


FIG. 1.

FIG. 2. FIG. 3.

sliding rail, *g*, *g* (figs. 1 and 2), which is sufficiently long to extend across and through the frame, and to engage in the slots, in which it is made to run up and down freely by means of a double cord, *i*, *i*, *i* (fig. 1), running on pulleys, *j*, *j*, *j* (fig. 1), in the manner of Venetian blinds. The friction is reduced by sash rollers inserted in sliding rail. The double cord is operated from the side of the frame, where it is made to engage on a stud, *k* (fig. 1), to retain rail in required position. The sliding rail is provided with a bracket at each end, *l*, *l*, *l* (figs. 1 and 2), placed at the proper distance apart, to receive pivots on background roller, and are branched outwards, as shown in fig. 2, to allow background to run free when in use.

The method of operating is as follows: The roller on which the required background is fixed is lifted from the rack and placed on the brackets of sliding rail, each roller being furnished with a winding cord, which runs on the pulley, *m* (fig. 1). This cord is passed under a tension plate, *n*, *n* (figs. 1 and 2), which exerts just sufficient pressure on it to prevent background from unwinding before required.

The double cord is now pulled, causing the rail to rise to the position shown by dotted lines (figs. 1 and 2), where it is retained by twisting said cord round stud, *k* (fig. 1).

Each background is weighted by having an iron rod hemmed in its lower border.

On releasing winding cord from tension plate the background may be lowered or raised at will, in the manner of an ordinary blind.

When it is desired to remove background and store it in the rack, it is first wound on roller, and the winding cord held in one hand, whilst the double cord is released from stud, and the rail lowered with the other.

The background is then lifted from the rail brackets and placed in the rack, where it is prevented from unwinding by means of a stud (fixed in upright), which engages in one of the slots cut in flange plate of roller, as shown in fig. 3, a stud being provided for each roller.

COPYRIGHT IN PHOTOGRAPHS.

At the Photographic Club, on May 16, Mr. A. Mackie addressed the meeting on the subject of copyright in photographs, referring at the outset to the existing Act of 1862 (The Fine Art Copyright Act), the provisions of which, whereby photographs and paintings were classed alike, were considered by photographers, as a whole, to be very fair. This act, after a lapse of some forty years, and in which no considerable alteration was deemed necessary by the body of photographers, it was now proposed to supersede, and it was of the new Bill that he desired to speak. The law relating to copyright in engravings, prints, sculpture, photography, and the fine arts is at present contained in no fewer than ten Acts which, under various names, have the dates 1734, 1766, 1777, 1814, 1836, 1844, 1852, 1862, 1875, and 1886. The new Bill proposes to supersede all of these Acts of Parliament, and very truly commences with a note to the effect that "the Statutes are so confused that it is useless to enter into their details." Mr. Mackie thought it was a step in the right direction to have one Act for all classes of copyright, but at the same time the existing Act suited photography very well, and there was no particular desire on our part to have it altered. Painters, however, found that it no longer suited them, and they have taken the matter into their hands and drafted a bill, which has been read a first time in the House of Lords, and referred to a Committee for amendment. The Bill was originally drafted by the St. John's Wood Committee of Artists, and in that form was entirely inimical to photographers, who were apparently considered as outcasts.

The original draft was very hard upon photography, and even absurd; but, as redrafted by the House of Lords, a marked alteration had been made. It was the re-drafted Bill which he had before him, and he thought it had been drafted in a spirit of great fairness to everybody. Photography was by no means badly treated. Whatever defects the Bill contained were due rather to a lack of acquaintance on the part of those who drafted it with the requirements of photography as distinct from the other classes of fine art. In the new Bill the term of the duration of copyright has been altered from life and seven years in the present Act to life and thirty years after the end of the year in which the owner dies. Of course, there was no objection to this. Of particular interest to photographers were the regulations under the heading, "Special Provisions." It was obvious that rules which might be applicable to paintings might not all be applicable to engravings. A painting was a definite thing in itself, and an engraving was created from something else. In photography we must have the negative and the print, and the special provisions deal with the differences between these. Copyright exists from the date of production, but under the new Bill nothing is said about registration, which is required by the present Act. He thought that there was a great deal in favour of continuing the clause providing for registration. It may be a pity that one should be called upon to pay for what is already his, but the fact remains that millions of photographs are taken with no prospect of their acquiring any exceptional value, until one day circumstances render them of considerable marketable value and they are registered. Registration provides a ready means of proving title to a photograph. Under the new Bill a man may come across a photograph, with no name or owner, which he wants to reproduce; yet, while he may have every honest desire to pay for its use, he cannot do so, and it is not safe for him to attempt to publish it for what might be the benefit of the community, for fear of consequences. When a photograph is of such value that the author desires to ear-mark it as his possession, registration should be his means of so doing. Its value should counterbalance any trouble or expense.

Under the new Bill the owner for the time being of the negative shall be deemed to be the author, and an assignment of the copyright may be made by delivery of the negative or by the assignment of the copyright in writing. Now, if the owner is the author and the photograph keeps changing hands, it becomes possible that the copyright may never cease, being in existence for the life of the author and thirty years. This was absurd, of course, and assignment of copyright by delivery of the negative would be found impracticable. As one present remarked, quite a number of copyrights would fall to the share of the dustman. Copyright under the new Bill belonged to the author, even though he may receive valuable consideration for his work. The right to print photographs in the latter case, however, does not go with the copyright. Permission must first be obtained from the party for whom the work was done. On the other hand, the person who pays for the photograph must go for further copies to him who took it, as the copyright belongs to the latter. Personally, Mr. Mackie thought the man who paid for a photo-

graph should be entitled to the copyright in it, and should not, in order to secure it, have to get it assigned to him, probably at further expense. His reason for this was best put in the form of a question, How much less would a photographer charge you for a photograph if you assigned to him the copyright? Not sixpence, he felt sure. The copyright would be worth nothing to him, as he could not deal with the photograph without your permission.

There was an interesting discussion of a conversational character, and a committee was ultimately appointed to examine and report upon the Bill.

ON THE PRODUCTION OF SILVER PRINTS WITHOUT TONING.

II.

In my former paper I endeavoured to show that the merits of a good silver print, including under that heading the qualities of permanence and appearance, are not, as is often supposed, inseparably connected with the particular means employed in its production. In the development of my argument I had occasion to make special reference to gold toning. I showed that, in regard to this, the common view is in all probability erroneous, there being no real evidence forthcoming to support the assertion that the retention of the toning process is necessary to success in silver printing. I then proceeded to point out the advantages which would be likely to result from the disuse of the toning bath were it found possible so to alter the conditions of working as to ensure that the quality of the prints would be maintained unimpaired.

In the present article I have to deal with the problem thus presented to notice. It is a problem of considerable magnitude, and one for which a satisfactory solution has still to be sought.

A few timid attempts have been made recently with the laudable object of improving the existing printing processes. Unhappily, the majority of these are of very little practical importance, but one or two display considerable ingenuity and a certain degree of merit. There is, for instance, what is known by the name of self-toning paper, an article of which several brands are now in the market. The particular advantage claimed for it is that no toning bath is required, as the gold salt is already present in the paper, and is reduced to the metallic state during the exposure of the print to light. Having had no opportunity of trying this paper, I am unfortunately unable to speak of its qualities from personal experience. Whatever its merits or otherwise, its use would, at all events, tend to effect a saving in time and a reduction in the amount of care and labour required, two of the advantages mentioned in my former article. On the other hand, the need for the employment of a salt of gold for sensitising purposes would not, I fear, permit of any reduction being made in the cost of the materials, a matter of the utmost importance from the point of view of the professional printer. The same objection will apply in an equal degree to an older and better-known substitute for the usual system of treatment. I refer to the combined bath for toning and fixing. Even were it not so, however, the latter would be disqualified on other grounds, there being, as most readers will be aware, serious objections, mainly of a chemical nature, to the use of the combination.

A few attempts have been made to improve the quality of the prints, and so get rid of the necessity for toning, by the introduction of special reagents into the sensitising formulae. The ferric salts have been pressed into service for this purpose, as well as those of uranium. These attempts have not been attended with success, for, though the quality of an iron or uranium print may be improved by the addition of a silver compound to the sensitising bath, the converse operation is found to produce a silver print of a very inferior description.

I shall now proceed to say a few words as to what would seem to be the fundamental principles involved in the matter, as, were these more generally recognised, the solution of the problem would be to some extent facilitated.

At the outset, what seems to have been quite overlooked in most of the attempts that have been made to improve the existing printing processes is the fact that it is to the silver compound, or compounds, present in the paper that the beauty of the result must be mainly attributed. A just perception of the practical value of this dictum is of the greatest consequence. Its importance lies in this, that only when it is fully realised does it become possible to exclude the operation of secondary causes, and thereby to advance towards a knowledge of the conditions favourable to success.

Regarding the matter from this standpoint, it will be perceived that there is nothing to be gained by employing as a sensitiser a mixture of metallic salts. Obviously, a suitable silver compound is all that is required. The question as to what constitutes suitability cannot, of course, be answered off-hand without recourse to experiment. A condition is, however, of necessity imposed upon us in making this choice. The silver salt selected must be of such a character that, in the subsequent manipulations, the operation of fixing shall not be destructive to the beauty of the image. This, in turn, naturally leads us to consider the nature of the fixing process, and to pass in review the various salts and other compounds that are available as fixing agents.

Fixing may be briefly defined as a process of solution whereby the unaltered and superfluous silver salts remaining in the print are removed

order to ensure its permanence. Now, it will be evident, on consideration, that the solubility of the silver compound, or compounds, which have to be got rid of will vary according to the special nature of the fixing agent employed to effect their removal, or, in other words, that the different substances employed as fixing agents will be found to possess different degrees of solvent power. Moreover, it will be seen that, in choosing a salt for the preparation of the fixing bath, we are, *ceteris paribus*, at liberty to select that which will permit of the operation being carried out with least detriment to the appearance of the print. The importance of this fact, regarded from a practical aspect, will be readily apparent.

Under any circumstances the choice of silver salts available for sensitising purposes is necessarily limited. It is therefore all the more desirable that the liberty of selection, such as it is, should be in no wise curtailed. Any restriction in the nature of a rigid adherence to one particular fixing formula will evidently tend to defeat this end, whilst, on the other hand, greater freedom of choice in the matter of fixing formulæ will serve to increase the number of silver compounds which may be used as sensitisers.

Upon the right apprehension and right application of the principles which have just been enunciated the attainment of success in any attempts that may be made to simplify and improve the manipulations of silver printing will, I incline to think, ultimately depend.

As a small contribution to the literature of the subject, I propose now to describe in a condensed form a few experiments in silver printing which were made by me about a year ago, and which, though of no great value in themselves, serve to show that, under conditions differing much from those that have been laid down for the printer's guidance, fairly good results may still be obtained.

The choice of a suitable silver compound was the first object of my inquiry. In the process of investigation it was found necessary to reject, as unsuitable for sensitising purposes, several well-known salts. Of these the most important was chloride of silver. The quality of the chloride image was found to suffer so much in consequence of the operation of fixing that, after an unsatisfactory trial had been made of a variety of fixing baths, it was thought inadvisable to make any further use of the salt as a sensitiser. A trial was then made of succinate of silver, the salts used for the purpose of sensitising the paper being nitrate of silver and succinate of soda. Paper so prepared gave, on exposure in the printing frame, a rather crude brick-red image, which, when fixed in the usual way, assumed a weak yellowish-brown hue. Oxalate of silver, employed as a sensitiser, gave a somewhat better result, but, as in the case of the succinate, the quality of the print produced was much inferior to that of a toned silver print upon plain paper. For fixing these prints a hyposulphite bath of the usual strength was employed. After making without success a number of trials with other silver salts, principally those of the commoner organic acids, some experiments were made with the neutral tartrate of silver. Employing this salt as a sensitiser, it was found possible, under certain conditions easily complied with, to obtain excellent prints which might be fixed in the ordinary way with very little loss of appearance.

The quality of the image produced by the exposure of the tartrate to light is such, indeed, as to warrant the assigning of a special place to the salt among photographic reagents. In richness and vigour it is scarcely to be surpassed. The abnormal intensity of the silver deposit enables the print to resist the reducing action of the fixing bath to a much greater extent than is found to be the case with the image due to chloride and to most of the other salts of silver. Three conditions would seem to be indispensable to success in working the tartrate printing process. In the first place, unsized paper only must be used. If this precaution be overlooked, and an albumen paper, or one sized with starch, arrowroot, or other similar substance, is employed, it will be found impossible to fix the print produced on such a paper without seriously impairing its beauty. The reason, no doubt, is this, that in such a case the image formed is due, not merely to the reduction of the tartrate, but also to that of certain compounds of silver, which have been formed by the action of the sensitiser upon the organic body used as a size.

In the second place, it is necessary that the sensitiser should be free from acidity. In experimenting with the tartrate, a sensitised paper neutral to test papers was treated with a wash of a weak solution of tartaric acid and dried. On exposure only a feeble image resulted. This, on further examination, was found to be composed of minute crystalline grains, which exhibited a strong tendency to detach themselves from the surface of the paper. The appearance, too, of the print after fixing was much inferior to what would have been produced had the acid treatment been omitted.

The third condition essential to the satisfactory working of this process is that the operation of printing be conducted in diffused light. When the printing is conducted in sunshine, red streaks are very apt to make their appearance, and, unless the utmost care has been taken to secure an even coating when sensitising, wavy lines and irregular markings are also likely to result. The loss of contrast, too, due to exposure in sunlight, is much more decided than it is in the case of a gelatino-chloride or albumen silver print.

For fixing this paper, the usual hyposulphite bath answers well. It may with advantage be used in a rather more dilute form than is com-

monly recommended. A very interesting fact in connexion with the tartrate printing process is that the fixing may be successfully performed by the immersion of the prints in a solution of ammonia.

In an article entitled "Ammonia as a Fixing Agent," which appeared in this JOURNAL on November 3, 1893, I described at length the course of treatment which I had found necessary to follow in using this reagent for the purpose of fixing prints produced by the ordinary chloride process. I showed that, in order to obtain good results with the ammonia bath, the prints must be toned in the usual gold bath before fixing. The process, therefore, it was seen, could not be carried out so as to effect any appreciable reduction, either in the cost of the materials employed or in the amount of time and labour demanded of the printer. In spite of these admitted disadvantages, however, it was felt that the introduction of the ammonia bath could be justified on practical grounds, seeing that, as a first step towards the production of permanent prints, it seems requisite that the use of sulphur compounds for fixing purposes should be abandoned. By employing tartrate of silver as a sensitiser instead of the chloride, I find it is possible, using the ammonia fixing bath, to produce excellent prints *without any toning whatever*. The image is of a somewhat warmer colour than that which is produced when the hyposulphite bath is used.

For the benefit of those who may desire to test for themselves the merits of the tartrate printing process, I give below the formulæ for the preparation of the sensitising and fixing solutions:—

Silver Nitrate Solution.

(a) Crystallised silver nitrate	280 grains, or 18 grammes.
Distilled water	7 fluid ounces, or 199 c. c.

Ammonium Tartrate Solution.

(b) Ammonium tartrate	250 grains, or 16 grammes.
Distilled water	10 fluid ounces, or 284 c. c.

Hyposulphite Fixing Bath.

Hyposulphite of soda	2 ounces, or 57 grammes.
Water	14 fluid ounces, or 397 c. c.

Ammonia Fixing Bath.

Ammonia (sp. gr. = .880)	2 fluid ounces, or 57 c. c.
Water	14 " " or 397 ,

With regard to the reagents employed in sensitising, I should here mention that ammonium tartrate is a salt which the photographer may experience some difficulty in procuring. Luckily for him, it can be very easily prepared at home, and this is the course I should recommend to those who may be unable to obtain it at the chemical dealers'. The only reagents required for the purpose are tartaric acid and ammonia. A saturated aqueous solution of the former having been made, ammonia is added thereto, drop by drop, until the acid reaction has entirely disappeared, this point being determined by testing with litmus paper. The liquid is then to be evaporated to a small bulk, and, when sufficiently concentrated, set aside to cool. When the whole has become solid, the crystals must be removed and spread on a sheet of blotting-paper to dry, after which they may be transferred to a bottle for preservation. The paper used for printing should be of tough quality, and should possess a smooth, close-grained surface perfectly free from size. In the case of the nitrate bath the operation of sensitising may be performed by floating the paper in the usual manner. After draining, the sheet should be laid aside in a dark place until superficially dry. While still damp, the tartrate solution should be applied by means of a soft sable brush, care being taken to coat the paper as evenly as possible. In order to guard against any excess of nitrate being left after sensitising, a second coating of the tartrate solution should be applied once the first has had time to soak into the paper. The sensitised paper will keep for about a fortnight if preserved from air and light in a dry place; but it should be used as soon as possible, otherwise the purity of the high lights may become impaired.

In the operation of printing an ample exposure should be given, as the loss of density on fixing is rather greater than in the case of a chloride print. If it is thought necessary, the prints may be well soaked in water before immersion in the fixing bath. In my own practice, however, they have invariably been fixed without this preliminary washing, and no bad results have ensued. In fixing with the hyposulphite bath half an hour's immersion will be required; with the ammonia bath an immersion of fifteen minutes should be sufficient, as its action is more energetic. On their removal from the fixing bath the prints should be washed in the usual way.

In the hands of careful workers the process just described is capable of affording results little, if at all, inferior to those obtained upon plain paper under the old system of printing and toning. Still better results might, perhaps, be obtained by the use of a stronger nitrate bath. As it is, the prints exhibit a range of tone, and warmth, and richness of colour which is remarkable, bearing in mind the circumstances attending their production and the simplicity of the means employed.

I recently made a few additional experiments with the tartrate, my object being to ascertain whether or not the valuable properties of the salt might be utilised for the purpose of preparing a gelatine emulsion. I made use of a formula very similar to that of the excellent one recom-

mended by Mr. J. Barker, but containing a little additional tartrate in place of the chloride of silver.

Unfortunately, through a want of proper attention at the stage when the silver nitrate solution was added, the resulting emulsion was not quite homogeneous, and, owing to the loss of silver tartrate due to this cause, the prints obtained were weak and somewhat mottled in appearance. These prints, without further treatment, were duly fixed in the hyposulphite bath. When removed from the solution, they were found to have lost considerably in vigour. On the other hand, the colour was fairly good, and, though lacking the richness and warmth of a print upon plain paper, possessed nothing of the unpleasant quality characteristic of an untoned and fixed gelatino-chloride print. On the whole, the result seemed to favour the conclusion that a process might be devised which would permit of the use of gelatine in the form of an emulsion. It has already been mentioned that, for sizing the paper, starch, arrowroot, and, in fact, most colloid bodies, are not available. I have not tried gelatine, but, from what has just been said the probabilities are that it might be employed for this purpose were due care taken to prevent its coming in contact with the nitrate of silver used in the sensitising operations.

This, of course, is a point which could be very easily settled by experiment.

In conclusion, I would recommend the readers of the JOURNAL to study this subject for themselves, and to endeavour by every practicable means to gain a fuller knowledge of the conditions governing the operations of printing, toning, and fixing.

In this way it will be possible to arrive at results which will be of real value, and at a solution which will be accepted as final.

MATTHEW WILSON.

RAPID AND WHOLESALE DEVELOPMENT.

[Paper read before the London and Provincial Photographic Association.]

It has been said, and no doubt with a considerable amount of truth, that concerning photographic discovery the amateur has taken the lead. We may qualify the assertion, and we will, by asserting that this was in the early days of photography. Nevertheless, the impression is distinct that we owe so much to the amateur, and you must pardon me a little if, for a wee bit, I champion the professional and the trade worker. Without doubt the professional runs in as many set grooves as he can, 'twere folly otherwise, from a business point of view. Chopping and changing to the amateur is pleasure; to the man earning his living by photography it spells loss—loss of time, loss of material, loss all round. The amateur has just as much fun and enjoyment over failures as with successes, but the professional cannot, in justice to himself, view failure with the same amount of equanimity.

Thus it comes that in the past, and even in the present, the amateur is the one who dares, who departs from handbook precepts, and who, in so doing, benefits his fellows by finding out something. All praise to him for it. At the same time let us not forget the professional worker, who consolidates by actual work what the amateur has merely skimmed over. I grudge the amateur nothing, I only plead for a slightly better recognition of the professional and trade worker's services. An invention remains an invention, a discovery no more than arouses interest, until one or the other has been put to a practical conclusion. It is the man who earns his living by photography that proves the case. The amateur may find the skeleton, but he leaves the professional to provide the body.

I am myself both in the skeleton and the full body line of business. You will, doubtless, remember my championship of ortol as a developer, both in the photographic press and at meetings of societies. My first impressions were gained, in the amateur profession, by the trial of a few plates; but I was afterwards able to confirm these from the commercial point of view. You may remember that a large amount of fun was produced by more or less sarcastic hits at what I may call my "table of quantities." In the article in one of our photographic journals upon "Ortol," I gave a list of plates, films, &c., that I had developed with that reagent. The only idea I had in so doing was to show that the remarks I made, and the conclusions I had come to, were not founded upon the two or three trials that the ordinary amateur might make; rather, that they were the results of sufficient experience to justify conclusions. The "table of quantities," however, was not, I am afraid, taken in this light, and considerable ridicule followed.

But my idea then was, as it is now, that, whilst a few trivial experiments may prove the possibility, it is to the practical carrying out of the idea that we should look for the probability—in other words, it is the practical worker who proves absolutely whether there is anything in the matter at all.

And here I feel I must have a go at the scientific expert, and I go for him in precisely the same way as I have already described the amateur's function. He does not test by practical rules. Test tubes, and conclusions carried out to the seventh or eighth decimal, prove but the germ.

The professional who exposes and develops two or three thousand plate or films can gauge the value of the new developer, or whatever he may be trying, very much better. Failure with him means serious loss; failure with the scientific expert, perhaps, merely provides him with copy for his next article in one of our periodicals.

Now, the point with which I am concerned to-night, viz., rapid and wholesale development, is just one which has shown me pretty clearly that we may learn much from wholesale work—that is to say, using a method or process upon a very large scale. In my own case time was an important item, as it cost money and inability to supply lost orders. Therefore our efforts for some time have been mainly directed towards turning out the work at a greater speed. Of course, conveniences for washing and drying were soon devised; and by the abolition of printing frames altogether, and printing four negatives on to a film at one time, we gained further rapidity. You will, perhaps, gauge our efforts best when I tell you that we found it pay better to do away altogether with our original transparencies and to substitute larger ones containing four each, the difference being simply that of having, say, a single whole-plate to handle as against four quarter-plates. At first thought you would deem this a very slight matter indeed; nevertheless, we found it worth three or four dozen extra negatives in a day's work. I may say here that our ambition was to turn out two gross of half-plate negatives per day, two persons only doing all the work up to hanging up to dry.

But all these details were quite secondary to development. We could push on in the exposing or in the washing and drying, but right in the middle we were compelled to jog along at the mercy of the tyrant developer. So then we settled down to quicken that process. We were using ortol soda at the time, and making use of the strong feature of that developer, its continuing action. I perhaps ought to explain that absolute density had to be coupled with the quick development, and that is where the difficulty lay. Our experiments merely proved that development to the density required took the same time practically whether a normal or an energetic solution was used. With an energetic mixture of one part ortol solution double strength, two parts carbonate of soda solution double strength, no sulphite of soda or bromide, the image appeared extremely quickly; but, alas! we had to soak for density—that is, we had to continue the development just about as long as with a normal solution.

I shall have the pleasure, later on, of showing you the continuing action of ortol, and at the same time Mr. Human will be able, I hope, to show you the development of a negative to full printing density in 18 to 20 seconds. We do some of ours in 10 seconds, but will keep to our original assertion of 20 seconds.

The developer he will use is a combination, but at present I am not at liberty to tell you anything about it. Not only does this developer act so quickly, but it gives greater density. If it should be thought that my idea of density, perhaps, goes hardly far enough, let me add that in our work we require absolute opacity in some parts. Take a border negative for instance, the part into which the portrait is printed in must be left a pure white when printing from the border negative, and that means, of course, great density.

A question you may ask is, how this quick development can be made useful to others. Some of you, no doubt, fail to see any advantage in it, and I dare say there are many to whom development is a pleasure to be drawn out and prolonged as far as possible. They like adding minims of bromide to restrain, a few drops of soda or ammonia to quicken, breathing on a part of the plate, and all the little dodges. It adds, in their estimation, to the value of the finished result. All I can say is, I don't. I should prefer my plates to come out of the camera developed, fixed, and ready for printing. Therefore, provided I get good results, the quicker I can develop the more I am satisfied.

But to any one who has the opportunity to expose correctly (or within a reasonable range of correct exposure), a number of plates, quick development will appeal. To the trade worker, the professional photographer who, knowing his studio light can take forty or fifty portrait negatives in a day quite near enough to correctness, or even the amateur who comes home with a few dozen plates, which by a preliminary test he finds are all about right, to all these speed in development will prove a boon. The tentative, and what I call the "patting on the back" methods, are all very well for a dozen plates, but, when it comes to hundreds, we get tired and want to work quicker.

I do not claim for this new developer that it will do everything. The very fact of its energy proves it to be unsuitable for over-exposure, and even for under-exposure it would require to be diluted with water in order to make it act more slowly.

To those who have no need for such quick work, but who yet wish to push on their development, I would strongly recommend ortol. In the

experiment I will show you I take an exposed film and develop it until the image is well out, then I shall cut it, placing one half in the fixing, and leaving the other in plain water. Personally, I use the stream from a tap, but, as I cannot do that here, soaking in plain water will show you, when contrasted with the half that is fixed, how enormously the action of ortol is continued; and, if this be taken advantage of, it helps considerably in getting through a big batch of negatives.

In conclusion, to refer back to the trade worker and the professional, it is when we are told that some thousands of negatives have been produced by a process that we place some reliance upon it. The two things in development I have spoken about, I can assure you, have been thoroughly tested for three or four months and in constant use daily upon—well, never mind how many million negatives.

This paper is really only a few notes strung together somewhat hurriedly, and forms part of a series of development experiments that I am engaged upon, but I thought they might interest you, and perhaps provoke some discussion. I can, however, describe the whole idea in a nutshell. A friend said, "Is it wise to develop quickly when you can do it slowly?" To which I replied, "Is there any sense in developing slowly when you can do it quickly?"

WALTER D. WELFORD.

PLATES VERSUS FILMS.

WITH many photographers, especially professional workers, there exists a strong prejudice against the use of films; and these are found pinning their faith exclusively to glass supports for their sensitive emulsion. In a great measure this prejudice is fostered by the experience of those whose work is chiefly confined to an interior practice, and who, as a rule, do a large amount of portraiture. On the other hand, there are a large number of professional workers whose calling lies in what may be termed a more "general run of work," very much of which consists in supplying photographs for special trade purposes, entirely outside a studio portrait practice, and with such workers films are looked upon with favour when any particular kind of commission has to be executed. At the same time it would be going too far to say that for every kind of subject films are as suitable as glass supports.

The first real attempt to introduce films for all-round general work, may be said to have originated with the Eastman Company; in fact, for many years, this firm has expended no end of money and labour in bringing to the present high state of efficiency, not only their continuous rolls of sensitive material, but likewise the cleverly conceived apparatus for utilising it; and hardly a season has passed, during the last ten years, in which some fresh advance in their apparatus has not been placed upon the market.

Their first stripping films are still remembered by many old workers, and not a few of them can still be found who look with satisfaction on the negatives secured by these strippers. The method of working them, at the time of their introduction, was, however, by many amateurs and semi-professional workers, looked upon as too messy. Still, they were a step in the right direction, and undoubtedly have led to the production of the more modern "non-stripping" films, which have, during the last number of years, become such a feature in hand-camera work with journalists and amateur workers throughout the length and breadth of the world; and now we see numerous makers catering for the public's support in this material. That there are many first-rate qualities of films now on the market is a fact well known to all those workers who have experience in developing for the trade, and those other amateur workers, who merely press the button and send the rest to be done by their dealer, or professional developist. At the same time it is often painfully evident to a professional developist that much useful material, in the way of high-priced films, is so carelessly manipulated, and which turn out so large a percentage of failures, even under the most careful system of development. Of course the quality of the films, in nearly every case, is blamed for such failures; whilst, in point of fact, the blame lies at the door of the worker who has exposed them. This, no doubt, has tended to give films a bad reputation, as compared with plates. There is so much what is termed snap-shot work done nowadays, with novices who seem to look upon hand-camera work as the most simple thing in the world, that it is little wonder many professionals have come to form quite a dread when asked to develop a number of rolls of sensitive films, the treatment of which, as far as subject and exposure is concerned, is quite unknown to them.

On the other hand, there are those workers who from the very first have seen the advantage which lies in films for various classes of subjects, and these, it is only fair to state, have carefully studied the special treatment necessary when using them, and who invariably turn out as large a percentage of good negatives as would have been acquired with glass.

Of the many forms of hand cameras specially designed for the use of films, it would be out of place to speak of any one pattern in preference to another. That a patent monopoly should rest with any manufacturer for a particular method of exposing films, or rolls of such material, is only a fair recompense, considering the great outlay they have expended

in experimenting, and bringing to such a state of perfection, the various forms of apparatus we now see designed for the purpose.

Every monopoly, however, does undoubtedly deter others from entering on similar lines, and hence we see so many forms of cameras limited to the use of films only, the outcome of which is seen in the exceedingly fine qualities which are now placed before the public; in addition to which there are several makes of films designed more particularly for use with special forms of cameras which are only available for them, and which form a striking contrast to the form of camera capable of exposing glass plates as well as films.

For quite a number of years it would appear as if most of the experiments conducted by manufacturers in the production of sensitive films lay in the direction of adopting that material only as dispensed entirely with the operation of stripping, and therefore, at first sight, it would appear a bold step for any one to suggest a return to the almost original idea of producing a film that required stripping of its paper support before it was in its best condition for printing; yet it is a patent fact that two, if not three, of the latest productions, and for which improvements are justly claimed, are actually "strippers."

These new forms of stripping films are a long way in advance of the original form of strippers, and even during the short time they have been before the public have gained a splendid reputation for negative working. The first of these later-day strippers was placed upon the market by Mr. Wellington, and this was soon after followed by a special class of material termed secco, and for which a limited company has been formed. As yet, the extreme simplicity in working of both of these films is not as well known to the public as they deserve. This, no doubt, is due to many causes, one of which being that many workers who use films are tied down by the form of their camera to some particular class of film that is specially required for same. That these modern strippers will, however, continue to make headway with the general public is a certainty.

The treatment of secco, for instance, is in reality quite as easy, in fact, easier, than the development of a glass plate, and, for the benefit of those readers who have as yet neither seen nor heard of the manipulations necessary, the following particulars may prove interesting.

The films are supplied in packages like bromide paper, each packet contains twelve films and twelve strengtheners. The latter are laid aside when the packet is opened, and only the sensitive films retained in the dark enclosure. The sensitive film is placed in any dark slide, and exposed as easily as a glass plate. Any formula in development can be used, and, if exposure is about right, the image comes along beautifully, and fine density is secured, as well as a nice range of half-tones, provided the lighting of the subject has been right. The film is then fixed in the usual form in hypo. In fact, up to this stage all the manipulations may be likened to the development of a bromide print on paper. After being well washed the negative is placed in a weak solution of glycerine and water for about one minute, and one of the strengtheners is also immersed in the solution at the same time. After a short immersion the negative is taken out and placed face upwards on a clean sheet of glass, a strengthening film is placed over the same, and both are squeegeed in contact.

In this condition the sensitive portion of the film is enclosed between two sheets of paper; it is, when still damp, pulled off the glass, and pinned up to dry in any suitable position. The drying does not take so long as with glass plates, by reason that the air has access to both sides of the negative, and when quite dry both papers will peel off the film with the utmost ease and certainty. Should intensification or reduction be required, either is as easily effected as with glass plates, and the tooth of the film is very suitable for retouching. For carbon work, where double transfer is shirked, these films are particularly well adapted; and they are just what is desired for the production of sky negatives, especially when exposed in conjunction with a black mirror. The emulsion is quite rapid enough for shutter exposures, and it is the writer's intention at an early date to make a few experiments in orthochromatising these films for colour work. In commercial photography they prove a great boon in many cases where glass plates would be of no avail, and when used in conjunction with one or other of the clever envelope contrivances, whereby only one dark slide is required, and this is capable of being filled and emptied in broad daylight, by reason of the opacity of the containing envelopers, they at once take a place in the first rank of up-to-date clever contrivances, getting rid of weight and the necessity of changing in the dark room, when a fresh supply is required, for any number can be carried in envelopes in the breast-pocket.

That a return to stripping films should have taken place will, no doubt, surprise many, but the fact remains that a distinct advance has recently been made in them, and, if the manufacturers continue to supply them in the excellent form and quality as at present, the public will most certainly get accustomed to their use, and much of the existing prejudice be dispelled.

A. T. NEWTON.

THE STUDIO OF THE FUTURE.

[Translated from the *Bulletin de la Société Française de Photographic.*]

At the establishment of one of the most skilful provincial photographers—M. Boulland, of Mâcon—I recently saw an installation of artificial light, a description of which will be of interest to all professional por-

traiturists with the camera. It is a fact that M. Boulland no longer uses daylight for any of his portrait work, and therefore the name which he has given his studio, *L'Atelier du XX^e Siècle*, is well chosen, for there can be no doubt that the next century will see artificial light in universal use. In giving a complete description of his plant we feel that the question is of interest to the amateur as well as to his professional brother, because the former is prevented from doing more in portraiture by the considerable expense entailed by a suitably glazed studio.

The studio is an elegantly furnished room, which may be furnished in any fashion, and is not lighted from without. The only condition is that the upper part of its principal accessory—the lamp—shall be capable of connexion with a chimney or flue. This lamp is a specially designed piece of apparatus, the back of which is shaped to certain curves which numerous trials have shown to be the best for diffusing the light as in an ordinary studio. The lower part is vertical, the middle portion is above the level of the model's head, whilst the upper part sends the light on to the ceiling of the apartment. Above is one white reflector and another on the shadow side of the sitter. The dimensions of the apparatus are: height, 9 feet 9 inches; breadth, 8 to 9 feet 9 inches; depth, 2 feet 6 inches. It is pivoted on its centre, so that its position in relation to the sitter can be altered.

Some idea of its internal construction will be gathered from the following description: The series of shelves are arranged behind the glazed portion for the reception of the lamps containing the flash powder. By thus varying the position of the lamps, the lighting can be modified as desired. The ignition of the combustible mixture is carried out by completing an electric circuit. Each lamp consists of a saucer-shaped receptacle, made of uninflammable and non-conducting material. In the centre of each the electric "igniter" is arranged, a thin circle of platinum wire, mounted on two metal supports. These "igniters" are commercial articles, and can be replaced after each exposure with the greatest readiness. As soon as the circuit is completed, the platinum becomes sufficiently heated to ignite the mixture, whatever number of lamps may be in use. The current is supplied from accumulators giving a current of eight to ten volts, and, in order to produce the magnesium light at exactly the same moment that the shutter is opened, the closing of the circuit is arranged in connexion with the mechanism which opens the shutter.

The question of the powder used as the source of light is one of great importance, as it is necessary to combine extreme rapidity of combustion with great actinic power. Without detailing the very interesting researches which M. Boulland has made, it may be said that he has prepared a mixture of extremely rapid combustion, insomuch that the eyes of the sitter never exhibit any trace of movement, and the operator can succeed perfectly with portraits of children. The actinic power of the compound is such that it is possible to take portraits natural size in a time which is only a small fraction of a second.

As will be seen from this brief description, the arrangement has been devised from the point of view of its industrial use. The apparatus is in regular use, not only in the inventor's establishment, but in those of several photographers who have realised the enormous advantages of not being dependent on daylight.

It is some time since that I stated at a conference that a day would come when, instead of estimating the value of light at the time of use, we should actually weigh it out.

This prediction is now fully realised, for the use of given weights of the magnesium powder allows results to be obtained under various conditions with a certainty impossible with daylight. In other words, the problem of what exposure to give no longer exists, and, with this simplification of exposure, development likewise becomes a much more automatic operation. To the amateur this will mean no difficulty from incorrect exposure; to the professional it will mean a much greater uniformity of result, and the avoidance of the duplicate exposures so frequently necessary.

The weight of the magnesium mixture to be employed depends on the aperture of the lens, the size of the plate, and the dimensions of the object thereon. A few preliminary experiments will enable the operator to decide the amounts necessary under the several conditions. As an illustration of this plan, the weights taken by M. Boulland, when using an aplanatic lens for large heads, may be given.

Lens Aperture.	Plate.	Powder Used.
<i>f</i> 8	<i>Carte-de visite.</i>	grammes.
<i>f</i> -12	Album.	2
<i>f</i> -12	7 × 9½	4
<i>f</i> -12	9½ × 12	6
<i>f</i> -12	12 × 16	8
<i>f</i> -15	16 × 20	10
<i>f</i> -20	20 × 24	12

These quantities correspond to what one would call a normal exposure. Development takes place rapidly and easily. Less powder can

be used if a smaller image is produced, or, if development is pushed further. Apart from its professional use, there is no doubt that artificial light will enable photography to be of great use to, say, medicine. It will be easy to obtain photographs of interesting cases in the most unfavourable (as regards light) situations.

A. LONDE.

Our Editorial Table.

"BURMA."

By MAX and BERTHA FERRARS.
237 pages, with a Map, Index, and Appendices, and 455 Illustrations from Photographs.
London: Sampson Low, Marston, & Co., Limited.

THIS magnificent book, we are sorry to say, has no preface. A note, introductory to the list of illustrations, tells us that some of the latter are by Bertha Ferrars, by whom all the plates were developed, and that the remainder, with few exceptions, are by Max Ferrars. These few modest words leave unsatisfied our natural curiosity as to the circumstances in which the authors came to write and illustrate the book. For *Burma* is not the hastily written production of the literary tourist, it is a minute and painstaking study of the manners and customs of the Burmese from the cradle to the grave, penned in the restrained and carefully chosen language of trained observation. The authors, we must perforce conclude, lived for a lengthened period in Burma, and their book is therefore to be looked upon as the outcome of a premeditated design to record not merely a series of impressions of a deeply interesting and original living people, but as a scientific chart of the characteristics of a race observed, so to say, under a microscope. Childhood; Adolescence; Manhood and Occupation; Trades and Professions; Alien Races; Political; Pageants and Frolics—these are the headings of the principal chapters. They indicate the scope—the angle of view of the book—but nothing short of actual perusal can give an idea of the wonderful devotion to detail which the authors display in their work.

For ourselves the immediate interest of the book centres round the fact that it is illustrated by considerably over 400 photo-type reproductions from photographs. When a book is illustrated in this manner, one of two things usually happens, either the original photographs are bad, or, if they are good, the reproductions are not. Frequently both are poor. In the present case neither one thing nor the other happens. The original photographs, it is obvious, were marvellously good, and they have not only been well reproduced by the Swantype Company, but are flawlessly printed. In the whole of our experience we have not come across a book so well illustrated by means of photography as is this fine work on Burma. After many hours spent in its study we are left regretting that no explanatory preface is given, but this does not detract in the least from the sincerity of the praise we are anxious to convey to authors, printers, and publishers alike for their share in the production of one of the best books of the year.

THE SANGER SHEPHERD UNIVERSAL DEVELOPER.

Manufactured and sold by Sanger Shepherd & Co., 5, 6, and 7, Gray's Inn-passage, Red Lion-street, Holborn, W.C.

THE intimate knowledge of photographic theory which Mr. Sanger Shepherd has long manifested, and the evidences he has given of a thorough practical acquaintance with the manipulatory requirements of successful development in many branches of negative work, qualify him in an especial manner to undertake the preparation of many photographic materials. His firm announce themselves as manufacturers of scientific apparatus, light filters for orthochromatic work, three-colour filters, apparatus and materials for process work, and every requisite for the photography of colour, and a glance through our pages for the past seven or eight years will show that the photography of colour has given Mr. Shepherd many opportunities for making useful contributions to our knowledge of the subject. The firm should have a great future before it, for Mr. Shepherd's researches and experiments in colour photography have been the means of equipping him with a wealth of knowledge that must possess very great practical value. The Universal developer that has been sent to us has been compounded for portrait, landscape, and hand-camera work, lantern slides, black-and-white, and bromide paper, and is claimed to be the only developer for orthochromatic or three-colour photography.

Messrs. Sanger Shepherd & Co. supply the following descriptive notes:—

"The complete developer is packed in two tubes, about four inches long by one inch diameter; the tubes are corked and sealed at both ends, and the contents may be forced out by a wooden plunger given with each box; all the constituents of each tube are in fine powder, and dissolve almost instantly in water. There are no complicated formulae to worry about, no weighing or measuring is necessary, and, as the chemicals used are carefully tested, both in bulk and in every batch put up, pure, fresh, and energetic solutions are instantly obtainable. The complete developer consists of three solutions. No. 1 is obtained by dissolving the contents of a No. 1 cartridge in 20 ounces of water. Cartridge No. 2 has a cork

division near the centre of the tube, marked by a heavy cross, and the larger portion is dissolved in 10 ounces of water to form the No. 2 solution, No. 3 being made by dissolving the remaining portion of a No. 2 cartridge in 10 ounces of water."

In the pamphlet sent us directions are given for the use of the developer in the eight or nine different classes of work mentioned above. Each tube makes 20 ounces of concentrated, or 40 ounces of normal, developer. We have no doubt that Mr. Sanger Shepherd's high reputation will ensure his firm's preparations great favour at the hands of photographers.

THE Celeritas Developing Powder.

Prepared and sold by William Tylar, High-street, Aston, Birmingham.

THESE developing powders are put up according to the familiar Seidlitz method. The contents of two paper packages are separately dissolved in water, and a few ounces of developing solution so obtained. Mr. Tylar remarks: Those people who only do a small quantity of plates at a time will, I think, appreciate this form, as the developer can be mixed, used, and thrown away. I am willing to send a sample packet to any inquirer on receipt of three penny stamps, or four kinds post free for 9d. We have now ready four kinds of powder, viz., hydroquinone, pyro soda, a one-solution compound, and hydroquinone and metol.

SPECIMENS OF PHOTOGRAPHIC PRINTING AND ENLARGING.

By Messrs. Morgan & Kidd, Richmond, Surrey.

TWENTY-ONE years have passed since the establishment of Messrs. Morgan & Kidd's business, which in that time has grown in variety and extent as well as age. We believe that the firm has the distinction of being the oldest makers of gelatino-bromide paper in Great Britain, if not the world. Vast, indeed, have been the changes made in manufacturing photography since 1879, but the Richmond house in 1900 possesses and shows every bit as much vitality as in the days when the late R. L. Kidd and Mr. W. T. Morgan were at the head of affairs. Quite recently we had an opportunity of examining a series of the different kinds of prints and enlargements which are sent out from the Richmond works. We saw collotype prints of the trade or commercial type being turned out in great numbers, whilst on other machines the most delicate kinds of prints for book illustration were being produced. A magnificent catalogue, containing over 100 10 x 8 prints, which the renowned engineering works of Charles Cammell & Co. (Limited), of Sheffield, is sending out, was shown us; it owes its fine collotype illustrations to the presses of Messrs. Morgan & Kidd. Post cards, local view books for photographers, imitation albumen prints, memoranda headings, reproductions of works of art, and many other branches of work are carried out in Messrs. Morgan & Kidd's collotype room, which, with the half-tone department, we have much pleasure in bringing to the notice of those of our professional readers who must have many opportunities of offering prints by these processes to their clients.

In the department of bromide enlarging Messrs. Morgan & Kidd have excelled for many years. We saw some magnificent life-size pictures of Miss Julia Neilson and other well-known ladies from negatives by Alfred Ellis, Van der Weyde, and others. These gentlemen know what is required in *clichés* of this kind, and they are fortunate in intrusting them to a firm like Messrs. Morgan & Kidd, who in the enlargements show a richness of shadow, delicacy of half-tone, and purity of light which do the most thorough justice to subject and process. A great feature of the business is the carbon enlargements, while a speciality known as the "Mulready" or cream crayon bromide finished with chalk should be especially attractive to those who appreciate tinted work. In catering for the photographic profession, Messrs. Morgan & Kidd have command of unequal skill and resources, and the quality of their work is such that it leaves little room for surprise that it is in very great demand.

DIE PHOTOGRAPHIE IM HOCHGEIBIG.

EMIL TERSCAK.

Verlag von Gustav Schmidt, Berlin, W.

ALPINE photography is one of the most difficult branches of landscape work, and the book before us will be welcome to many who wish to visit the Tyrol or the Alps in pursuit of subjects for the camera. The text is well illustrated with views taken by the author, and as it is written in an easy-going, popular style, the tourist will find it not only a book of reference, but a pleasant companion. We are glad to see that Herr Terschak condemns, in unqualified terms, any faking of the negative, and advocates photography in its purest style.

Studio Gossip.

THE TANQUEREY PORTRAIT SCHEME.—Mr. W. Blakeley, of 4, Seedley Crescent, near Manchester, is the latest photographer to send us a batch of Tanquerey literature. In time, no doubt, the energetic M. Tanquerey will have circularised the whole of the photographic profession in the country.

WE are sorry to learn of the death, on the 19th ult., of Mrs. Ada Isabella Stuart, the wife of Mr. F. G. O. Stuart, the well-known photographer of Southampton. The deceased lady was in her fifty-seventh year. We offer our sincere sympathy to our old and esteemed friend in his bereavement, and are sure that many readers will do likewise.

THE STUDIOETTE.—Mr. C. Parsons, of 48, Moffat-street, Nottingham, sends us a photograph and drawing of his invention, the Studioette, which consists of a box to hold backgrounds, fitted to hang anywhere at a moment's notice. It is principally intended for amateurs and outdoor photographers generally who cannot afford a studio. "Thumbscrews are fitted to the rail, which work in slots, and can be raised or lowered at will. The blinds are on rings, which also move backwards or forwards on the rails. The parts all fold into the box, the door at bottom then fastening with buttons, and the box can then be left hanging outside or taken under cover at will."

WHEN writing last week of the illness of Mr. John Stuart, of Glasgow, we had little thought that the genial Past-President of the Convention had been so ill as appears to have been the case. In a letter subsequently received from him he writes: "I regret to tell you that ever since my attack of influenza I have never thoroughly rallied or felt my old self; one thing after another seems to have come upon me and added 'fuel to the fire.' First, my fall from the scaffolding; then, a few days ago, got tripped up with some causeway stones which were being taken up at the crossing in Buchanan-street, and fell prone with a smash on the very hard causeway stones which you piteously deplored when you were in our city. As yet I hardly know what to say in regard to the visit to Newcastle, but you may rest assured that I will leave no stone unturned to join you there and cry 'Hurrah!' for the President-elect. At the present time there are two of my operators in the Royal Infirmary, one operated upon for peritonitis and the other laid up with a broken leg, while your humble servant himself is in a very shaky condition. However, I hope to improve through time." We are quite confident that Mr. Stuart's numerous friends in all parts of the country will echo the latter aspiration.

News and Notes.

THE Yorkshire Photographic Union's annual excursion to Ripon and Fountains Abbey will take place on Saturday, June 23.

MR. GEORGE MASON.—We are very pleased to learn that Mr. George Mason, of Glasgow, who has recently been somewhat unwell, is recovering, and hopes to be present at the Newcastle meeting of the Convention next month.

"DEVELOPERS AND DEVELOPING" is the title of No. 11 of the *Photo-Miniature*, published by Messrs. Tennant & Ward, 289, Fourth-avenue, New York. It skilfully condenses most of the available information on the subject.

THE BLAIRGOWRIE EXHIBITION.—Messrs. J. Craig Annan, Glasgow, and William Crooke, Edinburgh, who judged the last Exhibition, have again consented to act in that capacity. Mr. H. Snowden Ward has agreed to judge the Lecture Class.

THE PHOTOGRAPHIC "RED BOOK."—This is the title given to a little book designed for the use and information of the members of affiliated societies, to whom it should prove serviceable. It is issued by the Affiliation of Photographic Societies, 66, Russell-square.

RESTORING SPOILT ENGRAVINGS.—Mr. William Borough, of 2, Myrtle-terrace, Old Southgate, writes: "In answer to 'Engraver,' re restoring spoilt engravings, if advertiser will forward same to my address, I shall be pleased to undertake the restoration of them, it being quite in my line."

A CHANGE in the arrangements of the *Practical Photographer* and the *Junior Photographer* will take place in August next. It has been decided to combine the two magazines. The title of the magazine will then be the *Junior Photographer*, with which is incorporated the *Practical Photographer*.

THE RÖNTGEN Society's next Ordinary General Meeting will be held on Thursday, June 7, at St. Bartholomew's Hospital. Dr. Lewis Jones will show an influence machine of American design. Mr. James Wimshurst, F.R.S., will give a short statement of his work in the design and perfecting of the several forms of his influence machine. Dr. Rémy, of Paris, will show a new localising apparatus.

THE report of the Patent Office for 1899, recently issued, gives some interesting notes on the fluctuations of inventive genius. Towards the close of the year, as a result of the war in South Africa, there were several applications for shields for infantry; the extreme heat of the summer produced a few inventions for sunshades for horses; after a fatal accident in Ireland to a passenger on an electric tramcar there were several applications for safety arrangements for such cars; and the passing of the Shop Assistant Seats Act gave rise to over fifty applications for patents for seats. The largest number of applications on one day was 127, and the smallest fell as low as 50. From women there were no fewer than 574, of which 149 were for inventions connected with articles of dress, and 42 relating to cycling.

THE following appears in the current number of the *Harmsworth Magazine*: "100/- for a photograph. The Editor of the *Harmsworth Magazine* offers the following prizes in competition for photographs: 1st prize, 100/-; 2nd prize, 20/-; 3rd prize, 5/-; and twenty prizes of 1/- each. No restrictions of any sort as to size or subject are laid down, but an interesting or curious picture will be preferred. The competition is open to either professionals or amateurs. A selection of the photographs will be published in the Magazine, and all will be at the disposal of the Editor. No photographs will be returned, for those not used will be sent to Netley Hospital for the amusement of the wounded soldiers. All photographs must be sent in by the last day of September, this year, addressed, Competition, Photograph Editor, *Harmsworth Magazine*, Harmsworth-buildings, Embankment, London, E.C."

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—At a meeting of the Executive Committee, held on Tuesday, May 15, Mr. H. Snowden Ward in the chair, the preliminary report from the sub-Committee appointed to consider a proposal to prepare a lighter collection of pictures for circulation was adopted. The pictures will be uniformly framed, and the prints will not exceed 10 x 8 in dimensions, while there will be a celluloid front in place of the usual glass, in order that carriage may be reduced to a minimum. The collection will probably be ready in time for the exhibition season. Business relating to further lectures, and the arrangements for a proper geographical and time sequence of exhibitions, relying upon the inclusion of work from the bigger shows, was transacted. The amended rules adopted by the recent Conference of Judges were brought forward, together with the list of signatories. The attention of exhibition authorities is specially directed to these rules, copies of which can be had on application to the Secretary at 66, Russell-square, London, W.C. The Committee had before them the suggestion of the Liverpool Conference that the rule, giving as a right to members of affiliated societies the privilege of using dark rooms, &c., of other societies, should be modified. The Committee desire it to be understood that there is no rule on the subject, and that the privilege is intended only to be temporary to members visiting districts other than their own.

Commercial Intelligence.

MR. F. P. WELLS has opened an establishment at 105 Cannon-street, E.C. (opposite Cannon-street Station), for the supply of all photographic requisites.

THE Autocopyist Company, of 64, Queen Victoria-street, London, E.C., write: "We notice in last week's JOURNAL that for small numbers of prints you recommend collotype in preference to half-tone blocks. We would like to mention that for small numbers the photo-autocopyist would be found to answer the requirements of your correspondent, and give results equal to the best of collotypes at a minimum of cost. We enclose you a few specimens, which speak for themselves." The specimens sent are exceedingly good.

THE Board of Trade have appointed the Right Hon. Sir Edward Fry (Chairman); the Right Hon. Sir Richard Webster, Bart., G.C.M.G. (Master of the Rolls), the Right Hon. Sir Edward Carson, Q.C., M.P. (Solicitor-General); Sir Wm. H. Houldsworth, Bart., M.P.; Mr. F. J. S. Hopwood, C.B., C.M.G.; Mr. S. E. Spring Rice, C.B.; Mr. J. Fletcher Moulton, Q.C.; M.P., Colonel Thomas W. Harding; Mr. Edward Carpenter; and Mr. Herbert Hughes to be a Committee to inquire into the working of the Patents Act. Mr. A. Paget, barrister-at-law, is to be Secretary to the Committee.

At a meeting held on May 15, for the purpose of deciding upon the form of testimonial to be presented to Mr. A. C. Brookes, in recognition of his services to the photographic trade in organizing the late Exhibition at the Portman Rooms, Mr. S. L. Goldman in the chair, Mr. Dunn proposed and Mr. Ponje seconded, that some of the exhibitors at the Portman Rooms agreed that a present should be given to Mr. A. C. Brookes as a mark of their esteem, and in recognition of his untiring efforts and zeal in getting the Photographic Trade Exhibition together. The motion was carried unanimously. Mr. Ponje proposed, and Mr. Taylor seconded, that the present should take the form of a silver tray suitably inscribed. This was also unanimously carried. On May 23 the presentation was made at Mr. Brookes' office by Messrs. Goldman, Taylor, Ponje, and Dunn.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
4....	Bootle	{ Excursion: Bolton Abbey. Leader, L. D. Wood.
4.....	Borough Polytechnic	{ Excursion: Maldon (Essex). Leader, F. W. Bannister.
5.....	Gospel Oak	{ Chat on the Optical Lantern. J. E. Rayner.
5.....	Hackney	Members' Open Night.
5.....	Isle of Thanet	Annual Excursion.
6.....	Edinburgh Photo. Society	Election of Office-bearers and Councillors.
6.....	South London	Developers. W. Fenton-Jones.
7.....	London and Provincial	Open Night.
7.....	Royal Society	Ordinary General Meeting.
9.....	Darwen	{ Excursion: Hebden Bridge for Hardcastle Crags.
9.....	Redhill and District	{ Excursion: Godstone and Betchingley. Leader, John Sterry.
9.....	South London	{ Excursion: Titsey and Westerham. Leader, E. A. Whitby.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 29.—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

EXHIBITION OF PICTURES BY DR. EMERSON.

The Exhibition of photographs by Dr. P. H. Emerson, B.A., M.B. (Cantab.), was formally opened, the whole proceedings occupying only five minutes. Contrary to general expectation, Dr. Emerson did not give an address of any length, but simply made a few remarks relating to the pictures; and, a very cordial vote of thanks having been given to him in acknowledgment of the

time, trouble, and expense which he had devoted to the preparation of the Exhibition, the members present devoted themselves to a preliminary inspection of the exhibits. We say preliminary advisedly, for they demand more careful and detailed examination than they could have been subjected to on Tuesday evening, and will amply repay the earnest study of every photographer.

The collection comprises 140 examples of Dr. Emerson's work, and includes 35 platinotypes printed in 1886, and published in *Life and Landscape on the Norfolk Broads*; 19 photogravures published in *Pictures from Life in Field and Fen*; 24 photogravures (one by the author) from *Pictures of East Anglian Life*; 7 autogravures from *Idyls of the Norfolk Broadland*; 21 photogravures from *Wild Life on a Tidal Water*; 12 photogravures from *On English Lagoons*; 15 photogravures from *Marsh Leaves*, and a few others. Dr. EMERSON said that all the photographs were taken before the end of the year 1891, and many of them in the early eighties, with the exception of the only portrait shown, which dated from 1892, and was the first portrait taken with a tele-photo lens. The last-mentioned picture was the original print exhibited at the first Salon, in 1893. The platinotypes were printed in 1886, and their quality was well maintained. The photogravures were produced by Goupil, Lemercier, the Autotype Company, and W. L. Colls. The conditions of publication of most of Dr. Emerson's books necessitated the destruction of the negatives and copper plates immediately after the advertised numbers had been pulled, so that there had been no opportunity of making fresh prints in platinotype, a course which, if it had been possible, might have had an interesting result. Many of the works did not fulfil his ideals, but he thought they possessed certain instructive qualities; they would at all events prove how unfair were those critics who described his photographs as "fuzzytypes," and show that many so-called new departures were foisted years ago. He did not claim that any single one of them was a work of art; they were all naturalistic photographs, constructed in accordance with what he regarded as the true principles of art, and free from the fakes and mischievous dodges of the charlatan.

The Exhibition will remain open until June 30, from 10 to 4, and on Wednesdays from 10 to 8. Admission is free on presentation of card, and everybody should go.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 24.—Mr. R. P. Drage in the chair.

The general instruction that plates should be washed after development and before fixing was the subject of a short discussion, in which several advantages and disadvantages attending the practice, and the alternative one of omitting the washing, were mentioned.

Mr. WALTER D. WELFORD believed that the omission of the washing only gave rise to a possible discolouration.

Mr. E. J. WALL held that there was very little difference whatever course was adopted.

Mr. A. HADDON said that a slight increase of density, as a rule, was the result of no intermediary washing.

Mr. R. CHILD BAYLEY, on the contrary, said that density was increased by long washing after development and before fixing.

Mr. WALTER D. WELFORD read a paper [see pp. 346-7] on

RAPID AND WHOLESALE DEVELOPMENT.

The two experiments were then made, Mr. Child Bayley acting as time-keeper of the twenty-seconds' trial. The negative was removed at eighteen seconds, but it was thought to be of full density, and that less time would have served. The experiment showing continuing action conclusively demonstrated the power of ortol in this respect.

Mr. WELFORD agreed that most developers continued their action in water, but his point was that with ortol the power was so very much stronger as to constitute a distinct feature.

Surprise was evinced at the entire absence of fog with such a quick developer, and it was generally agreed that the developer was one that would prove a boon in certain classes of work, for which no more was claimed for it.

Mr. W. F. CRAWFORD showed in action his Express photo-developing machine, exhibited on another occasion, developing by its means simultaneously twenty-four quarter-plates in a very short space of time. The form of the machine was described at a previous meeting. The negatives were all satisfactory, and, being very similar exposures, developed up regularly and together. With varying exposures or uncertain ones it would be necessary to watch carefully for any flashing up of the image, and to transfer any that wanted special treatment to a dish for that purpose.

PHOTOGRAPHIC CLUB.

MAY 23.—Mr. A. Mackie in the chair.

The CHAIRMAN passed round a negative which had been spoiled during drying by falling dust. It had been placed to dry upon a shelf in a room, the ceiling of which had been newly limewashed, and specks of this falling upon the negative had dissolved the gelatine. Under a magnifying glass a transparent spot could be seen, and in its centre a nucleus of foreign matter.

Mr. G. J. T. WALFORD read his Affiliation lecture, entitled,

SOME METHODS OF CONTROL IN PHOTOGRAPHIC PRINTING.

The paper, which deals only with non-chemical expedients, was illustrated with a number of comparative slides, showing, firstly, direct and unmanipulated prints, with all their faults; secondly, the means thought suitable for their modification, such as ground or partially ground glass with pencilings, intended to mask too prominent features, applications of stained varnish, &c.; and, thirdly, the print as modified by the various methods touched upon in the paper. Pictures without skies were shown with the defect suitably remedied, harsh contrasts softened into harmony, objectionable details altogether removed, and many other corrections the need for which continually arises.

The Rev. F. C. LAMBERT remarked that the question of control in printing is one of the highest importance, and congratulated the reader of the paper in the systematic and exhaustive manner in which the lecture had been presented. The lecture was most instructive and useful, and should be read by every society in the country. He wished to know the best method of colouring att varnish for the purposes alluded to in the paper.

Mr. WALFORD replied that he bought his ready-made.

Mr. E. W. FOXLEE said that any of the Judson dyes which were soluble in the solvent of the resins of which the varnish was made would answer. Almost all the coal-tar colours were so soluble.

Mr. F. A. BRIDGE said a little turmeric added to the varnish was frequently used, letting the sediment go to the bottom and using only the top.

Mr. LAMBERT believed that iodine was generally used, but that it was rather difficult to produce a sediment. He wished that a method of applying matt varnish for this purpose by means of a brush could be found, as it was a great trouble to have to coat the whole of a surface and scrape away what was not required.

Mr. E. DOCKREE spoke of persulphate of ammonia as a method of control. Some time ago he took a negative in a hospital, and the whole of the subject was absolutely blocked by some windows. Persulphate alone would bring back all the hidden detail. In reducing hardness of pieces of water in a picture it was a valuable aid.

Mr. BRIDGE thought that, instead of troubling about partially ground glass, would save time to take a piece of ordinary ground glass, and render transparent those parts which were so required by the application of oil, glycerine, or other similar body.

The CHAIRMAN suggested an alternative method, that of varnishing the back of the negative with white hard spirit varnish, and producing a matt surface here desired by rubbing the dried coating with resin, pumice, cuttle-fish, or like substance.

Mr. BRIDGE said that a negative varnished with a mixture of gold size and turpentine would be found able almost to defy the effects of water or damp. It could also be put on with a brush, but its drawback was that it required two to three days for drying.

Mr. FOXLEE, referring to the treatment of carbon prints, about which some useful hints were given by the lecturer, said that clouds were usually put in by water colour applied to the back of the negatives instead of by double printing.

The CHAIRMAN, in reply to a question by Mr. Dockree, said that *papier minéral* was so called because it was waxed with mineral or paraffine wax. As regards the substitution for it of waxed tissue paper, he added that the paper sold as *papier minéral* was of a very fine grain, and tissue paper was, as a rule, very coarse in texture. Tracing paper would be better than tissue.

Some discussion having taken place regarding papers suitable for this purpose, Mr. E. A. NEWELL remarked that it was getting more and more difficult every day to say what any paper was, it might be pine wood or many things.

Mr. FOXLEE expressed surprise that the paper used in photography should continue still to be made by only two firms, and his astonishment that competitors did not step into the field.

Mr. BRIDGE thought that when one remembered that, notwithstanding the consumption of paper in photographic pursuits, its bulk was merely a fractional part of that used in other industries, there was little cause for wonderment.

Mr. NEWELL said that the water used in making photographic papers must be absolutely free from iron. He did not believe that there was such a thing to be found in England.

Mr. BRIDGE mentioned a new series of sky negatives introduced by Mr. Walter D. Welford, which were graded off into perfect opacity at one end, and were likely to be very useful. They were on celluloid, and could be had with the opaque portion merely at one end, or reaching nearly into the middle, to suit different classes of foreground negatives.

Mr. LAMBERT said he had prepared graduated shields by fixing a plate and dipping in a picric acid bath repeatedly, a little further at each immersion, until the required depth was obtained. He thought, however, that such plans as these were never used for other than particular purposes, and that many were able to do all that was required with the usual brown-paper shade.

A vote of thanks was given to Mr. Walford.

FORTHCOMING EXHIBITIONS.

1900.

- July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.
- August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
- October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- November 12-17 Ashton-under-Lyne.
" 21-23 Hackney Photographic Society.
1901.
- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between May 14 and May 19, 1900:

DEVELOPING TROUGH.—No. 8869. "Trough for Developing or Fixing a number of Photographic Plates Simultaneously." D. J. H. SIMONIS.

CAMERAS.—No. 9015. "Improvements in Photographic Cameras and in Appliances to be Used in Connexion therewith." H. W. JAMES.

CINEMATOGRAPHIC APPARATUS.—No. 9112. "Improvements in Apparatus for Photographing and Exhibiting Cinematograph and Mutoscope Pictures." H. W. H. PALMER.

CINEMATOGRAPHIC APPARATUS.—No. 9141. "Improvements in or connected with Apparatus or Mechanism for the Exhibition of Animated Photographs or Pictures." Complete specification. O. MESSTER.

COLOURED PRINTS.—No. 9202. "Improvements in the Production of Coloured Photographic Prints, Plates, Films, and the like." Communicated by A. Schwarz. The ROTARY PHOTOGRAPHIC COMPANY, LTD.

CINEMATOGRAPHS.—No. 9122. "Improvements in Cinematographs." C. J. D. OPPERMANN and O. R. OPPERMANN.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

MOUNTING GELATINO-CHLORIDE PRINTS.

To the EDITORS.

GENTLEMEN,—In your issue of May 4 inst., S. G. Elliott complains of his difficulty in mounting P.O.P. prints that have been squeegeed on ferrotype plates.

If, after the prints are toned and fixed and slightly washed, he gives them a bath for about ten minutes in a fairly strong solution of tannic acid, afterwards completing the washing, he will find no difficulty. He can even wipe off any of the mountant that may have got on the surface of the print with a wet handkerchief, without any injury to the gloss. *Crede experto.*—I am, yours, &c., JOSEPH RAWLINS.

Templeport Rectory, Co. Cavan, May 23, 1900.

THE STEINHEIL LENSES.

To the EDITORS.

GENTLEMEN,—With reference to the letter in your issue of May 25, from Mr. Arthur Rayment, we wish to point out that the Beck-Steinheil orthostigmat lenses made in our factory are made from the curves and specifications supplied to us by Dr. Steinheil, of Munich, and are identical with those made in his establishment.

These lenses are manufactured under license from Dr. Steinheil, who owns the British patents, and we also beg to inform your readers that we are the sole agents in Great Britain for orthostigmat lenses made by Messrs. Steinheil themselves.—We are, yours, &c.,

London, May 26, 1900. R. & J. BECK, LIMITED.

SALE BY PUBLISHERS OF PHOTO-BLOCKS, ETC.

To the EDITORS.

GENTLEMEN,—Are you not in error in thinking that "J. H." (see last paragraph on page 336) cannot prevent the music publisher from using reproductions of his photographs from the blocks sold them by Cassell & Co.? We have hitherto managed either to extract a new fee for such transactions or to disallow the blocks being used.

It is quite a common thing for publishers of illustrated papers and magazines to sell duplicates of their photo-blocks, and at the same time to acquaint the buyers of their necessity before publishing to ask the charge and sanction of the photographer.

This may not be the law on the subject, but it is a fair, common-sense view of the matter.

Perhaps some one of your numerous readers will be able to put the matter in a legal light.—I am, yours, &c., J. P.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

H. B. Collis, Westgate Studio, Canterbury.—Two photographs of crypt of Canterbury Cathedral.

T. Everitt Innes, 108, Wellington-road, Heaton Chapel.—Photograph of Miss Robinson's wedding party.

L. Varney, Bridge-street, Buckingham.—Photograph of Parish Church, Buckingham. Photograph of Market Hill, Buckingham.

The Worthing Portrait Company, 4, Railway-approach, Worthing.—Photograph of Lord Roberts's letter to schoolboy W. Treagus, with the toy reading same.

THE GLOBE ENAMELLER.—F. W. GLADISH writes: "Can you tell me where to get a Globe enameller or burnisher?"—In reply: It would have to be ordered through a dealer, as we do not think Messrs. Smith & Co. have an agent in this country.

STUDIO-BUILDING.—H. C. R. The design for the studio is all that can be desired; but, if you can get five or six feet more in its length, you will find it a great advantage. Twenty-one feet is really too short for professional work, as it entails the use of lenses of short foci and their attendant evils.

FAULTY CAMERA.—E. WILSON says: "I have two hand cameras, but only one lens, a R.R. f-6. When I use one camera, I always get the negatives perfectly sharp, but with the other they are always more or less fuzzy. Can you suggest why?"—It is perfectly clear that, in the latter camera, the dark slides are not in register with the focussing screen. The remedy is obvious.

ENAMELLING PRINTS.—GEORGE SNOWE says: "I have been in the habit of enamelling my prints in the usual way with collodion and gelatine. Do you think there would be any advantage in adding a little chrome alum to the gelatine on the score of increasing the permanence of the prints? They are albumen prints."—We should say not, as the alum would not add to the permanence of the picture.

SCRAP PHOTOGRAPHS OF BANK-NOTES.—C. C. asks: "Would there be any objection to my making scrap photographs of Bank-notes, for very large amounts, for sale? Of course, the copies would be of small size, and could never be passed off as the genuine notes?"—Yes; certainly. It is illegal to reproduce a Bank-note in any form or size, and if you did so you would get yourself into trouble.

MARKINGS ON DEVELOPED BROMIDE PRINTS.—E. B. writes: "Will you kindly save cause of marks on enclosed piece of bromide paper, and remedy. All prints, vignettes, and white grounds are the same, no matter what precautions I take."—Some bromide papers are very prone to give these markings where there are large white spaces. They, however, are easily rubbed off with a clean rag moistened with a little alcohol.

WIDE-ANGLE LENSES.—THOMAS BROWN. The optician referred to makes two forms of wide-angle lenses—one a landscape lens and the other a rectilinear, and we fancy you are confusing the two. The latter gives the marginal lines perfectly straight; the former, if used for architectural subjects, would render them somewhat curved. For pure landscape this is to be preferred, though it does not include quite such a large angle of views.

CARBON TISSUE.—HANTS asks: "Can you please tell me where I can get some carbon tissue that will yield pictures of the colour of the enclosed piece of silk?"—So far as we are aware, there is no carbon tissue in the market anything like that colour, and we should say there would be no demand for it if it were. If you want it, we expect you will have to get it made specially, or make it yourself. The Autotype Company or Messrs. Elliott & Son will possibly make it to your order.

BARYTA PAPER.—BARYTA says: "I want some enamelled paper (baryta paper), such as is used for P.O.P. I have tried that used by lithographers and others, and, although the surface answers, the paper itself gets so rotten when washed that it will not hold together. I only want a quire or two."—Messrs. Otto König & Co. are agents for the paper, but whether they supply it in retail quantities we cannot say. Apply to them. Their address is 27, Cross-street, Finsbury, E.C.

SAVING WASTE TONING BATHS.—X. Y. Z. says: "In a recent issue you publish an article by Mr. Webber, on 'Saving Waste Toning Baths,' in which he says, 'Throw your old toning solutions into the waste hypo jar.' I should be obliged if you will give me the formula for solution that will precipitate the gold and silver in the mixed baths."—The silver and gold should be precipitated with a solution of sulphide of potassium—"liver of sulphur." No more should be added than is sufficient to throw down the metals, as any great excess has a tendency to redissolve the precipitate.

LENS.—H. W. The lens you have is evidently a couple of simple meniscus lenses mounted in a tube. Some of the cheapest kinds R.R.'s, made abroad, are of this kind. Of course, its optical and chemical foci are not coincident.

VARNISHING PRINTS.—FADING writes as follows: "Can nothing be done to render silver prints more permanent than they are? They all seem to fade after a few years. Could not some sort of varnish be applied to them so as to quite protect them from the air?"—Varnishing a print would not prevent its fading if it contains within itself the elements of decay, as it does when imperfectly fixed and washed. If it does so according to some the varnish would rather hasten the fading than otherwise, as witness some pictures mounted in optical contact with glass.

GOLD PRECIPITATED.—W. PLUMMER writes: "I dissolved a fifteen-grain tub of Johnson's chloride of gold in fifteen drachms of water, and it soon turned dark, and next day there was a brown sediment at the bottom of the bottle. On making up a sulphocyanide toning bath with it, the bath would not tone at all; but, when I used it for a combined bath with alum and acetate of lead, it went all right. Can you kindly enlighten me why the two baths behaved so differently with the same gold?"—The reason is this: In the first place, the gold was dissolved in impure water or in a dirty bottle, and so became precipitated. Hence there was no toning agent in the sulphocyanide bath, nor was there any gold in the combined bath, but here the tones were got by sulphur toning.

FIXING.—AN OLD SUBSCRIBER writes: "It has come under my notice that, after having used the fixing agent, hypo, for prints many years, ammonia fixing is also used. Will you kindly inform me what quantities are used, and if it is suitable for large quantities? I am now using collodion-chloride paper, and find my prints metallic in the shadows. Will you kindly inform me the remedy?"—Ammonia is a very old fixing agent; it was used in the later "fifties," for plain paper prints, but it was not found suitable for albumen ones, as it has a tendency to dissolve the albumen. We have not tried it with collodion papers. We should say that it would be inconvenient to use for large quantities of prints on account of its fumes. By metallic do you mean bronzing in the shadows? If so, that should disappear in the toning and fixing of the pictures.

WHITE SPOTS ON PRINTS.—LUX writes: "I am enclosing portions of mounted print, on which you will notice a lot of white spots. I have of late been troubled by having several prints in every batch with the same spots on them, and cannot trace the cause. If you can indicate it, I shall feel greatly obliged. There is not the least trace of them until the prints have dried after mounting. I never get them on unmounted prints, and yet you will see that the mounts cannot be to blame, as the spots come whatever mounts are used. There can only be one other cause, unless it is inherent in the paper, and that is the paper the prints are covered with. Have you had similar inquiry to this made to you?"—As the unmounted prints do not show spots, and the mounts are not the cause, it would seem that they must be either due to the mountant, or, what is more probable, to particles of pernicious matter, as dust, settling on the prints after they are mounted and are still wet. It may be from particles detached from the paper with which the prints are covered.

MAGNESIUM CYLINDERS, &c.—PHOTOPHILUS writes: "1. I shall be grateful for information as to where cylinders of magnesium (mentioned in Lewis Wright's *Light*, and to be used like lime cylinders, with oxyhydrogen jet, for giving spectrum rich in violet rays) can be procured or how made. I tried with gum water, but, as I apprehended, the ones thus made flew in pieces under the heat. Would silicate of soda serve to knead the magnesium oxide with? 2. I should be glad also to know how to prepare that kind of bromide paper which discolours rapidly under the action of light without any developing process, and is used in some kinds of actinometers."—In reply: 1. Possibly Messrs. Newton, 3, Fleet-street, E.C., might procure these magnesium cylinders for our correspondent if, which we doubt, they are articles of commerce. For their preparation the following formula has been given:—

Precipitated chalk	4 parts.
Magnesium carbonate	1 part.

Mix to paste with gun water and mould to form.

2. Treat ordinary bromide paper (in the dark room, of course) with a thirty-grain solution of potassium nitrate, and dry in the dark.

OZOTYPE AND MARIOTYPE.—J. MACARTNEY writes: "Would you kindly inform me whether ozotype materials are on the market yet, or, if not, could you furnish me with Mr. Manly's address, and if it would be likely to supply me with materials for the process? 2. I tried mariotype by contact and pressure as described in THE BRITISH JOURNAL OF PHOTOGRAPHY in November 1897, but could make nothing of either process, neither with formula given nor slight variations of same; in fact, the tissue, which was in good condition, seemed to become almost insoluble, so that I had to use boiling water for development, and any slight image I got seemed to be tending more to the negative than positive. Do you know of any who have managed to work mariotype successfully according to directions given in THE BRITISH JOURNAL OF PHOTOGRAPHY? I used regular transfer paper and tissue, then prepared paper myself, but could not get a developable image in either case."—In reply: 1. Mr. Manly wrote us on the 27th ult. that the materials for his process would be obtainable in about a month from that date. Better watch our columns. 2. The formula we published was that given by Mr. Marion when he read his paper and demonstrated the process before the Photographic Society. We do not think either of the processes have been much experimented with in this country, though there is food for it. We do not know any one who is working it.

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EX CATHEDRA.

THE Paris Exposition, which was formally opened by President Loubet on April 15 last, is, we learn, not yet complete in parts, a matter which is, perhaps, not of the greatest concern to intending English visitors, the majority of whom have probably decided to make the trip to Paris in the holiday months of August and September. This, if we remember aright, was the case with the Exposition of 1889. In reference to that event, it may be of interest to recall the circumstance that photography was denied admission to a place among the fine arts, but was placed in the Industrial Section, "Class 12, Photography and Photographic Apparatus." For photographs, medals were awards to the following British exhibitors: Messrs. John Thomson, Henry Van der Weyde, Walery, gold; Messrs. Frith, J. Pattison Gibson, F. Hollyer, J. Lafayette, H. S. Mendelssohn, F. M. Sutcliffe, Werner & Son, West & Son, silver; Messrs. W. J. Byrne, James Burnside, J. B. Scott, and York & Son, bronze. In the Photographic Apparatus Section gold medals were awarded to Messrs. J. H. Dallmeyer,

Messrs. Watson & Sons, and Messrs. Ross & Co.; and silver medals to Messrs. Sands & Hunter and Messrs. Shew & Co. At the present Exposition, we may remind our readers, there are to be no medals awarded for photography, a fact which, we are aware, has robbed the Exposition of much of its interest in the estimation of British photographers. The space devoted to British photography at the Exposition is so small that it was found impossible by the Royal Photographic Society and the Camera Club, who were originally asked to undertake the work of organization, to get together a thoroughly representative collection of British work.

* * *

GENERAL WATERHOUSE and Mr. R. W. Craigie co-operated with the Royal Commission for the British Section of the Exposition in selecting photographic work for Paris, the first-named being responsible for the Scientific and Technical Section, and Mr. Craigie for the Pictorial. Both gentlemen, we are sure, did their best for the important interests committed to their charge, and it is their misfortune, and not their fault, that British photography is so inadequately represented at Paris. In 1889 the Photographic Class was placed in an upper building, but it attracted very few visitors, although, as a French writer at that time remarked, "there were a great many pretty things to be seen in the succession of gorgeously got-up salons, where the most celebrated photographers of Paris and other large cities tastefully displayed the finest specimens of their work." Moreover, in those days, "lifelike" portraiture and landscapes "minute in detail," were in almost universal favour. In the space of eleven years photographic tastes and fashions have changed—greatly changed. At a future date we shall commence a series of notes on the Exposition, the result of a personal visit. Meanwhile, we draw the attention of intending photographic visitors to a letter in our Correspondence columns from Mr. A. L. Henderson, who encountered some slight difficulties when photographing at the Exposition, which may be easily obviated, as he points out. We also desire to acknowledge the receipt from the well-known architectural photographer, Mons. Albert Lévy, of Paris, of a series of large views of the principal buildings comprised in the

Exposition. These admirable photographs very finely illustrate the gorgeous nature of some of the structures that have been erected on the banks of the Seine.

* * *

A FEW years ago, as our readers are probably aware, the Worshipful Company of Spectacle-makers, following the example set by some of the old City Guilds in encouraging and furthering the crafts they are supposed to represent, inaugurated a scheme of granting certificates and diplomas, after examination, to those who proved themselves to be competent to act as qualified opticians. The Company did this with the view that the public, when requiring aid to impaired vision, could go to a duly qualified man who understood the theory and practice of optics as distinguished from a mere seller of spectacles. The outcome of this has been the formation of the Optical Society, which, in the course of a year's existence, has secured a membership of some three hundred amongst the leading opticians. Last week the Society held its third social meeting, at which Mr. W. E. H. Thornthwaite, the President, and immediate Past-Master of the Worshipful Company of Spectacle-makers, and the main promoter of the Company's scheme for the certification of opticians, was presented with a telescope, manufactured by Sir Howard Grubb, of Dublin, at a cost of 200*l.*, while Mrs. Thornthwaite was also presented with a handsome opera glass. The presentation was accompanied by an illuminated address, including the names of Mr. Christie, the Astronomer Royal, Sir Robert Ball, the Irish Astronomer Royal, the Earl of Rosse, Sir Reginald Hanson, and many others well known in connexion with optical matters. It is very gratifying to see that many of the old City Guilds, which have money at their disposal, are now expending it with such good results, as witness the Spectacle-makers, the Carpenters, Plumbers, and several others, in furthering the interests of their crafts. Unfortunately, at the time these ancient City Guilds were formed, there was no photography, otherwise we might have had a Worshipful Company of Photographers.

* * *

In a leading article last week we referred to the Board of Trade having appointed a Committee to inquire into the working of the Patent Acts with reference to the granting of patents for inventions that are "obviously old," &c., and regretted that its scope was to be so limited, *i.e.*, to what the records of the Patent Office show to have been previously patented in this country. We learn that, with the sanction of the Treasury, some reforms are now being carried out in the administration of the Patent Office. These reforms are the outcome of a report of a Departmental Committee, which conducted an inquiry early this year, and whose report will shortly be published. One important point is that the Committee have come to the conclusion that, although it is unnecessary and impossible, on the ground of the cost, to reprint the nearly 9000 specifications that are now out of print, a public benefit would be conferred by giving the Comptroller-General authority to reprint such as there is a demand for. It is suggested by the Committee that he should do so on the understanding that the applicant for them should take not less than six copies at 8*d.* each. This will be a great convenience to the public, inasmuch as now those who wish to have a copy of a specification that is out of print must attend at the Patent Office and there make one. Another recommendation of the Committee is that, as the

illustrated abridgments of specifications have proved so useful to searchers, the old specifications should be abridged at the earliest possible date. It is therefore recommended that illustrated abridgments be prepared of the whole of the specifications from 1617 to 1883 on modern lines, and that the work should be done with all reasonable expedition. The more ancient ones will prove interesting reading, and the later ones, some of them, will prove valuable to intending photographic patentees, as showing what has been done before, and thus give them the opportunity of avoiding re-patenting something in which they have been anticipated. There are already abridgments of photographic specifications, but it is only the more recent ones that are illustrated. There are in the report other suggested reforms, but they more immediately concern patent agents than inventors who take out their own patents.

* * *

MR. H. P. ROBINSON's many friends in all parts of the world will be sorry to learn that in October last he was stricken with paralysis and forbidden by his doctors to write or engage in work of any kind. However, this week we have received a letter written by Mr. Robinson himself, in which he tells us that he is getting better in many ways—an item of news which we are sure will be received with widespread pleasure. Mr. Robinson will not be able to attend the July meeting of the Convention (of which he is Past-President) at Newcastle, but he sends his best wishes for its success. He has been in bed nearly the whole of the time since last October, and he therefore characteristically remarks: "It is fortunate that I prepared my Exhibition pictures last autumn." The forthcoming Exhibitions of the R.P.S. and the Salon will, no doubt, contain some of his work. Within the last few months, it may be remembered, the Council of the Royal Photographic Society conferred the Hon. Fellowship of the Society upon Mr. Robinson. He has been having a very bad time indeed during the winter, but his letter convinces us that he has so far recovered as to be able to resume his active interest in photographic matters, and we are confident we are but voicing the general wish that he should be speedily and fully restored to robust health.

* * *

THE New Gallery, Regent-street, W., which next October is to be the scene of the Forty-fifth annual Exhibition of the Royal Photographic Society, will witness several striking innovations in the classification of the exhibits, to two of which this is a favourable opportunity of making a brief reference. Section II. is to be reserved for general professional work. The prospectus states that the North Gallery will be set apart for a non-competitive exhibition of general professional work, including portraiture, figure studies and groups, landscapes, architectural and engineering photographs, exterior and interior work, &c. No restrictions will be imposed as to date of production or as to the previous exhibition of work for the section, which will be under the management of the Organizing Committee, by whom the right is reserved to reject any work that is considered to be unsuitable from any cause whatsoever. In the allotment of space and charges two methods will be adopted. (a) Space will be let to exhibitors who wish to make a collective exhibit of their work. They may arrange and hang it themselves, or, at their request, it will be arranged and hung by the Committee. Space will be charged for at the rate of 5*s.* per foot linear, payable on allotment. Application for

pace must be made by letter, addressed to the Secretary of the Society, on or before July 21. (b) One or more works may be sent to be displayed in the space devoted to general exhibits. The charge for space will be at the rate of 1s. per square foot occupied, with a minimum of 5s., the amount to be sent with the entry form.

* * *

THE foregoing quotations from the Exhibition prospectus should be interpreted as a strong invitation to that much-discussed individual "the bread-and-butter man" to take advantage of the special opportunity that has been created for him to exhibit his work at the R.P.S., let it partake ever so much of the characteristics of the much-derided "usual thing" or "show-case" varieties. Photography of this kind has not had much chance in recent years of manifesting itself at Pall Mall; but the *amende* is to be made at the New Gallery, where special provision is to be put forth for its reception. But let those photographers and others who intend exhibiting bear in mind that applications for space must be made *on or before* July 21. This is a point upon which, in the interests of those concerned, we specially lay emphasis—the decision to exhibit must be made within the next six weeks. For years past we have been the recipients of complaints that the R.P.S. exhibitions excluded what may be termed high-class commercial photography. Now, after this autumn, the ground will have been cut from under the feet of all objectors, for the prospectus as been drawn up on such very comprehensive lines that no class of photography is excluded. The Exhibition, if supported by those in whose interests it is held, should, for the first time in very recent years, be a thoroughly representative one.

* * *

ANOTHER class, "the trade," which has not hitherto been considered at these annual exhibitions, is also to have an opportunity of showing photographic apparatus and material not necessarily new or novel. Section III. of the Exhibition is reserved for apparatus and material, and that part of the prospectus which is of particular interest to the trade is as follows: "The non-competitive exhibits will be under the management of the Organizing Committee, and will be shown in the Central Hall. The exhibits in the sub-section will not be catalogued. The Committee have set apart certain space which will be let for the erection of stalls, and applications for space must be made by letter, addressed to the Secretary, on or before July 21. Stallholders will have to provide their own tables, stands, counters, show-cases, &c., and all structures, displayed signs, notice boards, &c., will be subject to the approval of the Committee. Attendants, if necessary, must be provided by the exhibitors. Orders for goods may be taken at the stalls, but no delivery at the Exhibition will be allowed. Catalogues, circulars, and price-lists may only be distributed from the stalls. Any special lighting of stalls required will be arranged for at the exhibitor's expense, where possible. No exhibitor will be permitted to transfer or sub-let any part of the space allotted him, and no substance of a dangerous or explosive nature will be allowed in or on any such space." This sub-section of the Exhibition has been arranged for purely in the interests of the trade, who, as pointed out above, should make applications for space by July 21 next.

* * *

WE may remind the photographic trade and profession, on whose behalf we have this week made such pointed references to the special inducements held out to them to take part in

the R.P.S. Exhibition next October, that the New Gallery is in all respects superior to the Pall Mall premises for the purposes of a photographic exhibition. The Water Colour Society's Gallery was admittedly too small for what it is now proposed to do. Moreover, it is situated in a thoroughfare which may best be described as leading from nowhere in particular to a destination just as vague. Still, even with these drawbacks, an average attendance of over 11,000 at the Exhibition was annually obtained. We are justified in anticipating a far greater number of visitors to next October's R.P.S. Exhibition at the New Gallery, one of the most commodious, popular, and successful suites of public rooms in London, situated in a brilliant and crowded thoroughfare, and therefore possessing exceptional facilities for attracting a very large number of people to a well-organized photographic Exhibition. We do not believe the photographic world has yet realised the full significance of the magnificent new departure which the R.P.S. has made in selecting the famous New Gallery as the scene of its annual Exhibition; but, when it is brought home to the minds of those interested that, for the first time, exhibition photography is to find a home amid surroundings not to be excelled in any other part of London, we shall be surprised if all classes of photographers and the trade do not come forward to support the Royal Photographic Society in its efforts on their behalf.

SOME RESULTS OF JENA GLASS.

THE knowledge of the use of Jena glass in photographic lenses is now virtually universal among all users of cameras; but, thanks to the vagaries of the English language, which permits such a word as glass to possess both a singular and a plural sense, there are many who are under the impression that Jena glass is one particular kind of glass, of novel composition, that turns out to be very useful to opticians. To most of our readers, however, it will be well known that really, instead of one kind only, there are made at the Jena works many scores of kinds possessing refractive and dispersive powers of different degrees, relatively and absolutely, each one of which is tabulated and its properties set out with exactness. Some of them are practically useless by reason of their susceptibility to atmospheric action, though that, in some cases, is remedied by sandwiching them between glasses of a more permanent nature. With such variety of optical possibilities the production of lenses of qualities which years ago were said to be impossible is now a reality, and, provided his purse is long enough, the present-day photographer can purchase instruments which, to borrow Dr. Johnson's words, possess potentialities of qualities beyond the wildest dreams of perfection of his immediate ancestors.

During the last decade some of the acutest intellects of the day have been engaged in the most intricate, laborious, and protracted mathematical calculations in the evolution of these new lenses, and for every year of that time one or more lenses of an entirely new type has been launched.

So great has been the change in the principles of construction that many old and familiar lenses have become superseded in actual practice, and, in some instances, no longer find a place in the maker's advertisements or price-lists. In some respects this is unfortunate, for there are some lenses of special convenience which for crisp definition and extent of field when well stopped down—a condition so often absolutely unimportant—are not excelled by any of the modern types.

The qualities that a photographer wishes his lenses to possess are freedom from astigmatism, flatness of field, extended covering power, rapidity, and "depth of focus;" beyond these, if his lens will break up into two of differing foci, he is all the more satisfied. Before briefly adverting to the first four of these qualities, let us again point out that the so-called "depth of focus" is a function of aperture only; it has nothing to do with the shape or construction of any lens, and is simply a question of diaphragm. It is as well to lay stress on this trite advice, for to this day there are makers of high standing who do not hesitate to describe their lenses as possessing depth of focus, thus leading the ignorant to believe that this depth is something inherent to the construction of the lens in question.

With regard to the other *desiderata*, the new lenses are a very long way in advance of their predecessors. In flatness of field (though this is not always an advantage) the correction is almost perfect, so that now a picture can be taken with the full aperture of the lens that shall be quite sharp from corner to corner, over a fairly large field, without using a diaphragm. Accompanying this quality is a freedom from astigmatism, of a most marked description. All the older lenses, when nearing the margin of a somewhat restricted field, were unable to give sharp definition in that part of the field, owing to astigmatism, and the only resource was to "stop them down," which is, really, evading the difficulty, not remedying the defect. We thus get extended covering power, though working at full aperture, and, so, the capabilities of the lens are increased. Those of the old lenses were limited to cover plates whose longest side was double the focus; but now lenses are constructed capable of doing that well, and with a diaphragm by no means small. One well-known lens will give, with a medium stop, a circle with a diameter of double the focus and yet give sharp definition on a flat field, with complete immunity from astigmatism.

Finally, we may refer to the single drawback possessed by most of these new lenses, their high price. This is not to be wondered at, as, apart from the extra care needed in manufacture, their components are greater in number. One well-known type is composed of cemented back and front lens, each of which is made of four single lenses. But even this drawback is in a fair way of disappearing, as the makers are introducing a fresh series at low prices, but yet unastigmatic and fairly quick. We wish our readers the good fortune to possess one or more of these invaluable triumphs of the optician's craft.

Acetylene Generation and Purification on a Small Scale.—A very useful and practical communication from the亥默尔实验室, Columbia University, upon this subject, appears in the *Journal of the American Chemical Society*. It starts by pointing out that for most purposes the purification is unnecessary, providing that the gas has been generated in a proper manner, the chief factor being that the action upon the carbide is not allowed to produce heating. This cannot be done by the slow drip of water, which often causes frosting and ejection of solid particles into the reservoir of gas. The carbide, preferably contained in a wide bucket or a wide-mouthed bottle, is covered with ninety-five per cent. alcohol. Slow generation at once begins, and enough gas is produced to expel all air present. Water now being added drop by drop, a gradual generation of acetylene occurs without material rise in temperature. Where economy is desirable, the alcohol can be distilled off and collected again. As to purification, the account states that no single one of the many published methods is sufficient, and a combination

of some of them is recommended. The gas produced as above is passed through an aqueous solution of 15·6 per cent. cupric sulphite to which has been added five per cent. of twenty per cent. volume sulphuric acid, the mixture absorbing the alcohol, ammonia, and hydrogen sulphide and phosphide. The gas may be further passed through one or two columns of pumice stone, saturated with an acetic or sulphuric acid solution or chromic acid. A small amount of these purifying minerals serves for a large quantity of gas. When properly carried out, the product is dry powder, and in lieu of the well-known nauseous odour possesses a faint and agreeable smell.

Sir W. Crookes on the Radio Activity of Uranium.

—We have from time to time brought before our readers accounts of the interesting researches of a small band of Continental workers on the remarkable radiations known from their first discoverer as Becquerel Rays. He first showed that uranium compounds emitted rays that affected a sensitive photographic plate through bodies actually considered opaque to light; they also discharge an electrometer when brought near them, and, unlike the Röntgen rays, are deflected by a magnet. Further investigation by M. and Mme. Curie and M. Bémont resulted in a widening of the source of these rays, the conjectural discovery of an impurity which was the actual main source of the rays and its ultimate separation in an impure form. Sir William, whose investigations into the rarer earth metals are of world-wide fame, has taken the matter up, and recently read a paper upon his work before the Royal Society. Some idea of his indefatigable industry and of the labour involved may be formed when we state that of the specimens in his immense collection of minerals every individual one was experimented upon, large plates being covered with black paper, the samples placed upon them, numbered and registered for reference, and then allowed to act for various lengths of time to forty-eight hours and the plates then developed. This was a mere preliminary to the after-investigations, which were naturally of considerable interest. It is impossible to find space for a résumé of all the work done, but those photographers who are following up this subject will find the paper *in extenso* in the paper of the *Chemical News*, the first instalment appearing last week.

Experiments upon the Aberration called Coma.

—Spherical aberration has always been a crucial difficulty to the lens-maker and not alone the photographic lens-producer. For axial rays it was not difficult to meet it fairly successfully, and the power given by the use of the various glasses from the Jena Works has greatly facilitated the cure. The most difficult aberrations are those arising from the rays striking the lens at an angle; the result has been that the central and the external rays do not meet at a point, the focus of the former lying beyond that of the latter, the result being instead of a point of light a point accompanied by an elongated patch, shaped like an oval extended at one end to a point, this effect being termed "coma." At a meeting of the Physical Society, held last week, Professor S. P. Thompson showed some experiments upon this subject, and among other things a most instructive stringed model illustrating the paths of light rays in the formation of coma. He described coma as being a unilateral distortion, the "tail" of which pointed in a direction depending on the side of the lens presenting to the light. It was due, he stated, to unequal magnification from different zones of the lens, a fact which was shown by covering the lens with a zone plate of three or four rings, and viewing on a screen the distorted images of the several zones. The form of the coma varied greatly with the distance of the screen from the lens. The use of a diaphragm gets rid of this and other aberrations; but for photographic work the problem set before the lens-maker is to avoid coma while yet using a large aperture.

The late Professor Piazzi Smyth.—We gather from several of our contemporaries that, by the will of the late Professor Piazzi Smyth, the executors are instructed to repay to the Government Grant Committee of the Royal Society all of the advances, estimated at 300*l.*, made by the Society to Professor Smyth for the purchase of scientific instruments after he went to Ripon. The will

queaths to the Royal Society of Edinburgh the portrait of Professor Smyth, by Faed, R.S.A., and all his books of original drawings and journals, and his boxes of glass photographs. The residuary estate to be in trust for certain legatees for life, and subject to their life interest for the Royal Society of Edinburgh, if agreeable to receive the same as a trust, whereof the income is to be employed by that society, first, in printing for a limited free distribution and a small sum to the public, at a cost of about 600*l.*, the spectroscopic MSS. offered by Professor Smyth to the Government in October 1857, and ten to assist or promote, every ten or twenty years, an exceptional expedition for the study of some particular branch of astronomical spectroscopy in the purer air of some mountain elevation of not less than 6000 feet above the sea-level, as tried and found feasible by me in the first experiment on the Peak of Teneriffe in 1856. If the residuary estate is not accepted by the Royal Society of Edinburgh, it is to be distributed amongst the pecuniary legatees.

THE SOLAR ECLIPSE OF 1900.

[The following interesting communication, which should have reached us in time for publication last week, was delayed in transit.]

In our country there are probably millions of people who have ever heard of Wadesboro. Such is fame. Yet Wadesboro is exalted above many great cities. I am going there. It is not suggested that the latter event necessarily implies the former. The two circumstances are mutually independent, though both are due to one cause and will culminate simultaneously. The final result, so far as I am concerned, will be photography of some kind; but what is to be represented in the photographs must necessarily depend upon the amount of cold water which J. Pluvius intends to throw upon the undertaking. In any case, however, a few details will not be out of place here.

The geographical situation of Wadesboro is approximately 35° N. lat. and 80° W. long. From New York, by rail, via Philadelphia, Baltimore, and Washington, the distance is about 650 miles. It stands at an elevation of 300 feet above the sea level, and commands an uninterrupted view of the State of North Carolina for a distance of twenty-five miles in all directions; and we have it upon authority that the climatic conditions of that region are "sultry."

From the foregoing details the experienced reader will readily deduce two facts: Firstly, Wadesboro stands upon the central line of totality of this year's solar eclipse; secondly, its immediate vicinity presents many advantages for the establishment of an observing station. Herein we have the secret of its sudden accession to celebrity.

The British Astronomical Association originally organized two expeditions to view the eclipse, one in charge of Mr. E. Walter Maunder, F.R.A.S., of Greenwich Observatory, bound for the shores of the Mediterranean; the other, under the leadership of the Rev. J. M. Bacon, F.R.A.S., whose destination is Wadesboro. The former expedition has been divided into various parties, which will be stationed at a number of points between Ovar, in Portugal, and Algiers. The American party maintains its original organization, and of this party I have the privilege to be a member. We are now ploughing our way across the Atlantic, enjoying the scenery (fog exclusively) off the Great Bank of Newfoundland, and cheered by the incessant melody of the hooter, superadded to the seductive charms of the syren. By the time these lines reach England we shall, I trust, have reached our destination, and have completed all preparations for observing the phenomena of the eclipse.

It is anticipated that a party of American astronomers, under the leadership of Professor Young, of Princeton University, will also be quartered in the neighbourhood of Wadesboro, in which case the situation should be eminently congenial.

Of the courtesy and kindness displayed by the American authorities, technical and official, it is impossible to speak too highly. Everything that could be done for the comfort and convenience of the expedition has been done with characteristic thoroughness; to take one instance only, information likely to be of service in selecting a site for the camp.] It might be thought that, if we received

particulars of a few suitable localities, nothing more need be done; but that is not the view which our American cousins take of the whole duty of man; far from it. Anything and everything at all calculated to be of assistance has been sent over. Such insignificant trifles as trouble and expense have been disregarded entirely. Of books, pamphlets, charts, maps, and tables, geographical and meteorological, everything one could desire has come to hand, and the general excellence of these publications is worthy of note in every respect. The fact is, in science as in most other things, the Americans mean business, and they leave no doubt upon the subject. Would that it might always be so in our own country! But—

It is rather disheartening to think how other countries foster and encourage the work of investigation and discovery, whilst, save for private enterprise, such matters receive only the cold shoulder in England. The present is, of course, only a small instance, but there it is. Think what America has done for our expedition; then reflect that our own Government would not even help us in the matter of chronometers, notwithstanding the fact that we were prepared to accept responsibility for everything in the nature of risk or possible damage.

The work to be undertaken at Wadesboro will be, of course, mainly photographic. Direct observations of an eclipse are as useful as ever they were, and are made freely, but in no department of science has photography effected a greater revolution than in this. Formerly, if used at all, photography merely supplemented the more direct methods of research. Now the case is reversed. We are no longer mainly dependent upon what can be seen by the eye and indifferently recorded by the hand; we now place our chief reliance upon the record made by the sensitive plate. To the casual observer the most striking change would lie in the instrumental outfit of a modern observing party, as compared with the apparatus used years ago. In the majority of cases, what used to be the eye end of the telescope is now the camera end. Most of the observations are not made *during* an eclipse; they may be made days, weeks, or even months afterwards. Let the exposure and development of the plates be satisfactorily carried out, and the actual results can be determined at leisure. In fact, as a rule, all the observer has to do during an eclipse is to "press the button;" he "does the rest" subsequently. The advantages gained by the adoption of photographic methods may be summed up as convenience, simplicity, and accuracy. It is not too much to say that nowadays it would be possible to learn more from the observation of a single eclipse than was ever known of the subject before the advent of photography.

The following details will serve to give some idea of the outfit with which the expedition to America is equipped, and will roughly indicate the work which, weather permitting, it is intended to undertake. It will be noted that none of our instruments can be said to attain to large dimensions. Nevertheless, taken altogether, they represent a considerable bulk of luggage for one small party to carry ten thousand miles in the hope of observing an occurrence which will be visible for about ninety seconds.

Our leader, the Rev. J. M. Bacon, is taking (1) a sixty-inch telescope camera, 4·1" o.g., for photographing the inner corona. (2) A photometric camera for making a comparison between the actinic luminosity of the corona upon this occasion with that of the full moon at a similar altitude. With this instrument exposures have already been made upon the zenith, illuminated by the full moon, one half of each plate being shielded. During the eclipse identical exposures will be made upon the unexposed halves of the plate. In this way the plates upon development will give a comparison of the actinic intensity of the two sources of light. This is a point upon which exact data are of considerable value. (3) Mr. Bacon is also taking with him apparatus for observing the reduction of temperature during the eclipse in strata of the atmosphere somewhat removed from immediate contact with the surface of the earth. (4) An automatic recording actinometer completes Mr. Bacon's outfit. The purpose for which this is to be employed is to decide an extremely interesting question. It has frequently been noted that after totality the light appears to return much more quickly than it dies away as totality approaches. The question is, Does this appearance represent an actual fact, or is it merely an optical illusion, due

to increased sensitiveness of the retina acquired during the comparatively dark period of totality? Many persons have held the latter view, and it is extremely difficult to conceive what can be the cause of this singular fact, if fact it be. At Buxar, however, during the last eclipse, Miss Bacon made a series of equal exposures at regular intervals upon the landscape, before and after totality. This series seems to prove conclusively that the light returns far more quickly than it dies away. Knowing how careful a worker Miss Bacon is, I cannot feel any doubt that her records are substantially accurate, and the differences are so marked that it is impossible to conceive that any accidental error could account for them. It is hoped that the present device, which I have had the privilege of designing, will serve to settle the question one way or the other.

The automatic arrangement consists of a clock-driven mechanism, which causes a sensitive ribbon to travel, at a uniform rate, across an opening, through which the prismatic image of a slit is projected. At a given moment, say, five minutes before totality, the moving ribbon is punctured by a steel point, actuated by means of a key, under the control of the operator. At the exact moment of totality (second contact) the ribbon is again pierced. At the conclusion of totality (third contact) a third puncture is made; and, finally, the ribbon is punctured for the fourth time five minutes after totality has ended. Upon development, the impression upon the ribbon will represent a dark band, whose width will vary with the intensity of the illumination. The brighter the light, the greater will be the distance extended by the image towards the red end of the spectrum, and *vice versa*. The four punctures serve to check the rate of travel of the ribbon. If the movement is uniform, the punctures will be situated symmetrically on either side of the central point of totality. If not, the error will be readily calculable. Assuming that the mechanism is found to run truly, any lack of symmetry in the record can only be due to variation in the intensity of illumination.

Miss Bacon is taking with her a battery of cameras, all mounted upon a single equatorial axis, clock-driven, and with a sliding arrangement for changing the plates. The object of this apparatus is to secure a number of comparatively long exposures, in order to record the outer extensions of the corona to as great an angular distance from the sun as possible. The present being a period when sun-spots are at a minimum, very wide coronal extensions may be looked for. Miss Bacon is also taking a fixed camera for obtaining a sequence of landscape views for comparing the gathering and departing darkness—in fact, repeating the observations already referred to as having been made at Buxar.

Mr. G. Dixon is taking three instruments: (1) a fixed telescope camera, with forty-four-inch Dollond objective; (2) a fixed ordinary camera, with nineteen-inch Ross lens; (3) a hand camera with five-and-a-half-inch Wray R.R. lens. This latter instrument will be used in making an attempt to photograph the so-called shadow bands or ripples of varying intensity of illumination, which follow the course of the moon's shadow over the surface of the ground. These bands are a curious phenomenon, the origin of which is doubtful, and it is hoped that we may be successful in obtaining some representation of them, but they will require something in the nature of a quick exposure.

Miss E. K. Dixon is taking only one instrument, but one in the use of which she is skilled, having had previous experience with it in observing eclipses. That instrument is a slitless spectroscope. It will be employed for eye observations during totality.

The rest of our party, myself excepted, will, for the most part, be concerned in making eye observations of various kinds before, during, and after totality. All, of course, have cameras; and, no doubt, a number of exposures, for various purposes, will be made. These, however, must be dealt with subsequently, when we come to a description of the work actually done. We hope to impress a number of strangers into our service when the time arrives. To this end we have come provided with a supply of minor accessories, such as dark glasses, &c., which will be distributed to any persons who may be desirous of assisting in the work. A specimen of the form containing questions to be answered by those who undertake eye observations is appended hereto. It is not intended that any one observer should answer all the questions put down. Each will select for himself the

particular observations he would prefer to make, and will confine his attention to those points exclusively.

As to the share which I, personally, shall take in the work of the expedition, I can only say, at present, that it remains to be seen. I have just received the cheering information that the case containing the bulk of my instruments cannot be found. It is believed to be on the vessel, but no record of it appears in the baggage list, and it is not manifested in the vessel's manifest. If it should not turn up at New York, I am afraid the messages sent across the Atlantic will be calculated to cause a breakdown in the cable by which they are transmitted. The ship's officers are all very much concerned about the matter; but that does not help very much, under the circumstances. The chief engineer, I hear, has suggested that, if the worst comes to the worst, he can lend me an indicator, which will accurately record the horse power of the eclipse, and give reliable information concerning the variation of pressure during each stroke of the piston. I am going down to say a word or two to that officer presently.

NEVIL MASKELYNE.

BRIEF OR PROLONGED EXPOSURES.

THE almost universal tendency of photographers, especially amateurs, to-day seems to be in favour of what is called instantaneous work. I can understand that, for certain subjects, such as running water and animals, &c., in motion, the exposure cannot be too brief, and some of my own best negatives of landscape subjects with foreground torrents have been made with exposures of the five-hundredth to the thousandth of a second, and, where the torrent is an important part of the subject, this brevity is imperative; but, the moment that we come to other conditions, as where the general definition is important and the distances great, demanding an exposure which necessarily sacrifices the detail of form in the torrent, as in an exposure of the tenth of a second, the best policy is to hide the moving water, or treat it as a simple mass of light in the picture, for the water comes as well with ten seconds' exposure as with the tenth of a second, no form being rendered in either case. In fact, I do not care for a photographic rendering of water, really plunging with an exposure of less than the five-hundredth part of a second.

To get this, or anything approximating to it, you must have a very rapid, and therefore large and heavy, lens; by preference, beyond debate, in my own experience, the Goerz double anastigmat, and everybody who has used that lens knows how ponderous it is for large sizes, and how limited in the range of field it is unless stopped down, when it becomes no longer available for the fractional exposures I have indicated, and torrents of breaking sea are out of the question with it. "Instantaneous" is a vague and relative term, for, in reality, the thousandth of a second is no less a time exposure than is one of ten seconds, but the deficiency of our optics and our material makes the record in that fraction of any natural phenomenon satisfactory for all practical purposes, and we may even regard the five-hundredth of a second as instantaneous in the photographic use of the term.

In hand-camera sizes the optical defects are so concealed that we may consider even the fifth of a second as brief enough to be called an instant, but in the rendering of falling water we see how far it is from the ideal. In large sizes, which I am considering as the indispensable field for the attainment of the highest qualities of photography, the tenth of a second is inadmissible for even moving figures in the streets, and beyond that the prolongation of exposure is a matter of indifference, and I consider the longest possible the best; and, in such places as the public squares on the Continent, and landscape in general, I prefer an exposure long enough to allow all moving objects to obliterate all impression of themselves on the plate. Photographing the Piazza of St. Mark at Venice, for instance, I used to give the smallest stop, and interrupt the exposure by putting the cap on the lens when anybody stopped before it, so that in the negative there appeared no people in the square. My friends wondered when I found the Piazza so empty, but there was no intrusion of those absurd passers-by whose ambition it is to get themselves, *per fas aut nefas*, into everybody's sight and notice, and

to make it a rule to get in the field whenever they see a camera up in a public place.

The professional photographer, doing his professional work, knows that he wants much better than I can tell him, but for those who want to do good work on their own requisition, I should say, Do good quick, or good slow work, but don't confound them. Recognise the limitations in either kind, and, if you want the former, devote yourself to the class of subjects best suited to it; get a powerful lens, a focal-plane shutter, and the quickest plates in the market and reconcile yourself to many failures to one complete success, which, however, will be a wonder of its kind and repay you. If you want a charming landscape or architectural subject, use a slow lens, a landscape lens (I find the concentric by far the best for general landscape work or architecture), and with a small stop give maximum exposure and a restraining development; but don't try to attain both objects in one negative, for you will certainly fail, and produce only a compromise, which is always detestable except politics, and even these they are always unsatisfactory.

W. J. STILLMAN.

DR. EMERSON AT THE ROYAL PHOTOGRAPHIC SOCIETY.

[SECOND NOTICE.]

It should not escape mention that the work now being shown at No. 66, Russell-square, was produced by the only man who so far as received the Progress medal of the Royal Photographic Society, in cognition of his efforts as a teacher and exponent of pictorial photography, and it therefore possesses exceptional interest on that account. There is another feature of the Exhibition that gives it a distinctiveness of character which, if it tells very largely in its favour with those who are familiar with Dr. Emerson's many-sidedness as an observer of nature, may, to those who only know him in his photographic aspect, appear as a drawback. With few exceptions these photographs were made for the purpose of illustrating the author's books on East Anglian life and customs, and consequently without the guidance of explanatory text the special qualities of the photographs are not so obvious to the hance spectator as they might be.

This perhaps is only another way of saying that Dr. Emerson, like his two predecessors, in these interesting one-man exhibitions at Russell-square, Mr. Craig Annan, and Mr. F. H. Evans, might with advantage have reduced the number of his exhibits. All three gentlemen diluted their collections of photographs with a number of specimens of good photographic quality but lacking in sufficient interest to entitle them to a place in a collection of work representative or at any rate expressive of their author's best powers. On the other hand, it must be allowed that it is an exceedingly difficult thing to draw the line between work which should find a place in a one-man show, and work which should not. There is no getting away from the fact that the maintenance of a uniformly high level of productive or creative power is a phenomenon not often met with in intellectual workers. The best of us, no matter what our bent may be, are mixtures of the good, the bad, and the indifferent; and the same thing holds good with regard to our work.

With the exception of these somewhat superfluous pictures, such as *A Fisherman at Home*, and *On the Baulks*, to name two typical examples of the least interesting work sent by Dr. Emerson, there is scarcely a photograph here hung that does not possess its own special interest or offer a lesson to the photographer willing to learn one. Three or four impressions left after repeated study of Dr. Emerson's work may be usefully set down here. In the first place, look where you may amongst these 140 photographs, there is no apparent striving after effect. The subjects, obviously simple in themselves, have been given simplicity of treatment, the evil hand of the photo-faker being absent all through. Then, again, if the values of the photographs are carefully studied, it will be seen that in by far the majority of cases they have been correctly rendered in the prints. Where, however, there is an apparent falsification, it is probably due to the printing of the photogravures, which, in some cases, are clearly overdone.

Two other points are worthy of special attention: first, the natural manner in which most of the groups and the figures are posed; second, the really marvellous suggestion of motion which Dr. Emerson has succeeded in imparting to some of his subjects. We may quote as effective illustrations of both these points, No. 20, *Rowing Home the*

Schoof-stuff, and No. 55, *The Poacher*, the most celebrated of all his photographs. In No. 9, *Gathering Water Lilies*, we renew acquaintance with a glowing photograph which provoked a great deal of imitation at the time of its production. At the present day, when sheep studies are engaging considerable attention, it is interesting to note Nos. 42, 50, and 64, in which Dr. Emerson's dexterity makes itself apparent—here he shows us that he had thoroughly anticipated one of the latest departures in pictorial photography. In all these and many more we perceive complete command over figure and animal work—no stiffness, no awkwardness is visible in them, while in one, No. 46, *At Plough—the End of the Furrow*, there is a simply wonderful suggestion of natural forward movement, alone sufficient to make the author's reputation in this respect.

Dr. Emerson's versatility is illustrated by No. 142, *Portrait of a Lady*, taken with a tele-photographic lens in 1892. Only last year an eminent French photographer wrote about tele-photographic portraiture as if it were a very new thing indeed. In No. 106, *A Yarmouth Row*, we have a pleasing study of unique domestic architecture. The series Nos. 122 to 136a, which illustrate *Marsh Leaves*, are realistic photographic studies of winter phases in Broadland, snow and mist predominating, and they reveal the author's faculty of translating his observations into photographic records. The predominant impression of the student that East Anglian life and landscape are being illustrated in these photographs should not, indeed, obscure the great fact that the eight walls are covered with work intended to prove that pure photography has been employed to produce pictorial results true to nature, simple in sentiment and treatment. Nothing is shown in an exaggerated or aggressive aspect. Clouds do not overbalance the rest of a photograph, and, where rippling water is shown, the rest of the picture is not made wholly subordinate to it. The "models"—the wherrymen, boatmen, fishermen, and field workers—have, it is clear, not been specially prepared for the occasion. They have been photographed in their working habits and as they work, and, excepting in the few cases to which we above referred, a centre of interest is maintained in all the figure studies.

A one-man show hardly calls for criticism of the particularising kind demanded by exhibitions to which a great number of photographers contribute, and in the present case the circumstances are so peculiar that one's remarks must necessarily harmonise with the spirit which guided Dr. Emerson in organizing his Exhibition. It is a farewell show, in fact. We have therefore to bear in mind that the photographs are the outcome of six or seven years' close study and observation of the possibilities of producing pictorial results by the aid of the lens and the dry plate. That work was long ago completed, and Dr. Emerson is now content to let his writings and photographs speak for themselves. Both should be studied simultaneously in order that perfect justice should be done to one of the most thorough-going and earnest workers photography has yet produced. We hope to hear that the Exhibition at Russell-square, which closes on the 30th inst., has been largely visited. As we remarked last week, the photographs will never again be seen in collected form.

Some months ago, while reviewing the third edition of *Naturalistic Photography*, we expressed the hope that a fourth edition would one day be called for, and we made some suggestions for the omission of some not wholly essential information of a technical kind. If our suggestion is acted upon, we trust the chance will be taken of illustrating the volumes by carefully made copies of some of the photographs now to be seen at Russell-square. Thus theory and practice would go together, and the result would be a valuable contribution to the history of British pictorial photography.

DOES BACKING SLOW THE PLATE?

[A Paper read before the North Middlesex Photographic Society.]

A QUESTION has been raised as to whether a backed plate requires longer exposure than one which is not backed, or, as it has been shortly put, "Does backing slow the plate?" Some have not hesitated to affirm that backing does necessitate an increased exposure, and I think that the proportionate speed in the two cases has even been stated as generally applicable. The question is one to which a simple yes or no answer, universally applicable, cannot properly be given, as, although the cases in which any gain in rapidity can be detected from the use of an unbacked plate may be very rare, and even then accompanied by loss of quality, yet in the interest of strict accuracy a qualified reply should be given.

The idea that an unbacked plate will work faster than a backed one, doubtless, originated from a knowledge of the fact that what is known as auxiliary exposure may be employed to aid the more faintly illuminated

portions of the image in registering themselves on the plate. Auxiliary exposure was employed to some extent in the collodion days, and is effective in some cases with gelatine plates, although not generally advisable.* Amongst the methods suggested in the collodion days was the use of a looking-glass behind the plate—a method resembling the use of an unbacked plate in that the auxiliary light acts chiefly close against the high lights, and not on large masses of shadow.

The method generally adopted when any auxiliary exposure was desired was the exposure of the whole surface of the plate to a weak light for a definite period. This plan is much more to be recommended, as it is a recognised maxim that the exposure should be fixed as sufficient to bring out the faintest radiations that we desire to register, or, as it is sometimes put, "Expose for the shadows, the lights will look after themselves;" and these faint radiations commonly exist as weak lights, breaking up large masses of shadow, out of reach of what is reflected in halation.

As the effect of backing is to prevent reflection into the film of that light which would cause halation, and so act as auxiliary, it follows that, if a plate is coated sufficiently thickly to prevent halation without backing, the presence of backing can have no effect on its speed. The same may be said of any ordinary plate, when the contrasts in the subject are not so great as to cause halation.

Let us now consider the cases in which halation may come in as a factor rendering a shorter exposure desirable with an unbacked than with a backed plate. In the first place the contrasts may be so strong that the high lights and the parts immediately surrounding them will be blocked up and appear over-exposed with an unbacked plate before the large masses of shadow are sufficiently exposed to show the desired detail in them. In this case a compromise may be effected and a shorter exposure given to save something of the lights, whilst sacrificing the shadows. Of course, the result is inferior to what would be obtained on a backed plate with exposure sufficient for the shadows. Another case is where the lights are evenly distributed throughout the picture, and the shadow details nowhere distant from them, as in the case of a window with the groining or device separating and immediately surrounding the panes of glass. Here halation will act as auxiliary exposure, and allow of a shorter exposure being given, although, as before, with inferior result. Another possible case is in copying a black-and-white line subject, when with a thinly coated unbacked plate a shorter exposure than will suffice to get density in the lights must be given, to avoid filling up the lines, both by irradiation and halation—again with inferior results.

Leaving these exceptional cases, it may be said that, with a fairly coated plate, on an ordinary subject, no difference of speed can be detected between a backed and an unbacked plate. I have here four negatives, all of which are on plates that were backed on one half only. The first is on a sensitometer, and no trace of difference can be discovered between the backed and the unbacked halves. The second is exposed on some trees in a garden, and there is no difference in the two halves, except that, at the top of the unbacked half, the twigs and leaves suffered slightly from halation, whilst on the backed half even a telegraph wire is distinct. The third is a window, and, though the lace curtain is clearer in the backed half, there is no difference in the detail either of the furniture below or of the cornice above it. The fourth is of a drawing-room, with window in the centre. Here the table in front of the window and the ornaments upon it show lighter in the unbacked half, and the same effect is noticeable in the music stool and end of the piano, which come in front of the white lace curtain. At a short distance from the window, however, the dark corners of the room are alike in the two halves.

To sum up, then, backing does not affect the exposure, save in a few exceptional cases, and in those cases the exposure is only shortened by submitting to a sacrifice of the better quality which backing would have secured.

W. E. DEENHAM.

HANGING THE ROYAL ACADEMY EXHIBITION.

MANY of our readers who are occasionally represented by their work at photographic exhibitions may read with some interest the following brief account of the method adopted by the Royal Academy of Arts in selecting for exhibition the many thousands of paintings, &c., annually sent in to Burlington House. We abstract the article from *Knowledge* for June:—

Works in sculpture, oil and water colour, black and white, and architectural designs pour into the cellars of Burlington House during the three days granted to would-be exhibitors until they total some 14,000. The names and addresses of the authors of each work have to be re-

* Some experiments by the late Professor Burton and myself on the effect of auxiliary exposure on gelatine plates were published in the early eighties.

corded, and the thousands of pictures or framed works have to be sorted and arranged, more or less according to size, in order that they may be viewed.

When the viewing day comes, a Council of ten members of the Academy sit and see the whole of these works. It is obvious that men of the highest standard in their art, trained in eye and mind, are able to reckon up the relative merits of very many of the works brought before them in a moment. A Council of Examiners conducting a *vivâ-voca* examination on some hundreds of students seeking to pass in French would dispose in an instant of such as could not speak three words of that language. Thus fall some thousands of works, which their authors and friends esteemed highly, no doubt on the principle "where ignorance is bliss 'tis folly to be wise." Tolerable works receive more attention, but the greater number of these follow the multitude downstairs into the cellars. Anything that the eagle-eyed Council regard as good work is set aside as doubtful (that is, accepted to be hung if space permits), and these works are so numerous that it is utterly impossible for anything like the whole of them to obtain a place upon the walls. A very small quantity of exceptionally good works—seldom more than eighty—are "accepted" to be "placed" in excellent positions.

The labour of viewing some 14,000 works is enormous. A procession of bearers carry the pictures in a stream before the Council, the names of the various artists not being mentioned. Sometimes the stream rolls on, dull and heavy, at other times it sparkles with "good things." Woe to the mediocre work that finds itself amongst the pearls; had it appeared in the midst of the dull and heavy, it might have had a chance, but in all things comparisons, if odious, tell. A very small part of a second can be given to the larger number of the works, as here described.

A vast number of the works have now to return to the cellars. As the works leave the large gallery where the Council sit, they are classified at once by a staff of commissioners stationed in the various galleries, and are thus alphabetically registered. Some thousands of cards are issued to the authors of these works, the educational effect of which should be to make each recipient "a sadder but a wiser man."

The first part of the Council's labour is now over, and so great is the strain of the concentrated attention given to the work that most of its members are exhausted. This portion takes from seven to eight days.

Then there comes a selection of the selected works—a second viewing. The "doubtfuls" are far too numerous for the space yielded by the walls of the Academy, and hence this fresh sifting.

The duty of the Hanging Committee, consisting of five members, now begins.

The Academicians, whose works have been passed in outside the turmoil of the 14,000, have first to be considered. This year the Academicians are particularly strong, and their works are, as a whole, such as have not been seen for many years. Each Academician is entitled to have four only of his pictures upon "the line," a graceful act to the outside artists, who otherwise would hardly ever obtain this desired position. Places of honour are apportioned to the finest works of members, and, after that, places of honour and position are given to the "accepted" works, and the best of the doubtfuls.

The mass that is left is picked over for the remaining space. The sizes of pictures tell for or against their being hung, as also does the subject, and the colour of the work. Let any one sit down in a room of the Exhibition, and observe how well balanced in size, subject, and colour, most of the walls are, and consider the labour of the Hanging Committee.

No member of the Council (with the exception of the President and Keeper) is allowed in the galleries until the hanging is complete. Then the other half of the Council, together with the President and Keeper, go through the rooms. They pass the work of the Hanging Committee, should it be approved, but it very often happens that what is considered an injustice in the hanging of a picture is, at this final viewing, altered by the Council.

But the labour is not yet over. First and foremost, the endeavour of the Hanging Committee has been to give as good a show as is possible; still, errors may have crept in. Has any "accepted" picture, with its red star, been overlooked? Has an old exhibitor who once earned fame for himself been lost sight of? If such is the case, the Committee orders such works to be hung, and down must come other works to make room. No alteration can take place after this.

Everything that can be done to act justly and generously has been done, but there are hundreds of "doubtfuls" for which no place can be found, and some, no doubt, are better than works that are hung. Perhaps these did not fit, perhaps they were overlooked. Also, as it is impossible to satisfy every one whose work finds a place in the Exhibi-

ion, there must always be a considerable amount of annoyance caused to exhibitors whose work is poorly located.

The Royal Academy of Arts holds itself highly. On the Press day none of its members appear. The critics are left severely alone to say their worst or best. The critic who finds fault is less likely to be laughed at for his ignorance than he who falls into the error of lauding an inferior piece of work.

A COMPACT OXYGEN GAS-METER AND HOLDER.

ACCORDING to the June number of the Camera Club *Journal*, at a recent meeting of the Club Mr. Simmeljaer and Mr. Abrahams showed an apparatus, invented by Mr. J. R. Rutter, limelight expert at the Opera House, Capetown, for making and accumulating oxygen gas without the aid of bulky gas-holders, and without the costly and heavy reservoirs which are the only means of carrying oxygen from place to place. The machine was conveniently small and compact, the outside measurement being only eighteen inches by fourteen inches, and it was capable of furnishing a continuous supply of gas for any length of time. By the substitution of glass retorts and the provision of additional wash bottles, it could be used for generating gas sufficiently pure for the work of dentists and others. The nature of the apparatus may be gathered from the following extracts from the directions for use:—

The tank is filled three parts full with water, and the gasometer inverted in it. To the right of the tank is hung a carrier, on the upper portion of which is placed a pipe, to which four retorts are connected. Immediately at the back of the retorts, and about six inches lower down, in the carrier, are holes in which are placed the supporting rods, the former forming a rest for the retorts, and the latter a support for a spirit lamp. Each retort having been filled with a quarter of a pound of black oxide of manganese and crystal chlorate of potash, mixed in the proportion of three ounces of black oxide of manganese to a pound of chlorate of potash, the several parts of the apparatus, gasometer, wash bottle, ether saturator, &c., having been connected, the spirit lamp is placed under the first retort, and from one retort to another, as each in turn is exhausted.

THE NEWCASTLE CONVENTION.

HISTORICAL NOTES ON THE PLACES TO BE VISITED.

[Reprinted from the *Official Handbook*.]

STANDING on the line of the Roman Wall, which stretched from Bowness-on-Solway to Wallsend-on-Tyne, Newcastle had its focus in the walled military camp, whose site it has entirely obliterated. The family name of the Emperor Hadrian, who visited Britain in A.D. 120, was given to the Roman bridge crossing the Tyne at this point; and the great stationary camp, which occupied the hill above as a *tête-du-pont*, shared with the structure the name of Pons Aelii. It is the second station, counting from the eastern extremity of the Roman Wall at Wallsend, and its site is located to the south and west of the Cathedral Church of St. Nicholas. Pons Aelii was the "Old" Castellum as distinguished from the "New" Castle of Norman times, in which originated the distinctive name of Newcastle-upon-Tyne.

The Castle.—The remains of the Norman fortress still extant are: (1) A Postern, with portions of the southern face of the outer wall, on the Castle Stairs, at the descent below the Moot Hall. (2) The Great Tower or Keep in the Castle Garth, built by Henry II., A.D. 1172 to 1177. It is now occupied by the Society of Antiquaries, of Newcastle-upon-Tyne. A Fore-building carries the outer stairway, by which entrance is gained through a machicolated turret. Original lamp niches are seen in the ascent, and at the stair head is an apartment with decorative Norman features on its inner wall faces. On the left the ascent is continued through a rich doorway leading into the Great Hall. Here are hung banners of the knightly families of the north; around are weapons and armour used in the defence of the town, with many pieces of ancient artillery and other antiquities. Stairs from here lead up to the battlements. Immediately below is the Library, enriched with specimens of armour, weapons of offence, and many other objects. Below this the basement floor is reached. Here the great central apartment possesses an original Norman column with radial vaulting. Numerous missiles of stone, used in the defence of the castle, together with relics of the later adaptation of the place as a County prison, lie around. An intramural chamber leads to the Chapel of the garrison, a fine example of late Norman work, exhibiting many characteristic decorative features in which the appearance of the volute in the capitals will be noted.

Further interest will be found in the mural chambers (in two of which the original fireplaces are extant, and in one of which the Castle Well is placed), and in the labyrinth of newel stairs, passages, and galleries throughout the building, whilst the view from the battlements reveals a prospect of the city and river below. The Castle and Black Gate Museum are open daily from ten to four. (3) The Great Gate, commonly known as the Black Gate, built A.D. 1247. The gateway, showing its portcullis grooves, has an arcading on either hand, with doors giving access to semi circular guard-chambers. These present fine examples of thirteenth century vaulting. The superstructure, modified early in the seventeenth century (when it was converted into a dwelling), is now used as the Museum of the Society of Antiquaries. Here are many interesting relics of the past, several pre-Conquest fragments, and the Society's unrivalled collection of inscribed and sculptured stones from the military stations and the line of the Roman Wall.

Town Walls.—Considerable remains of the Town Walls are visible, including Towers, Turrets, and a Gateway. These were built at various dates from the thirteenth century. (1) At Hanover-square (foot of Westgate-street, behind St. Nicholas Parish Room) a length of wall remains complete with parapets and embrasures. It was the locality of one of the breaches made during the siege of 1644. (2) At the West Walls (opposite Westgate Police Station) are Durham Tower, Heber Tower, Morden Tower, Ever Tower, with examples of Garites, or watch towers, upon the connecting walls. (3) North side of St. Andrew's Churchyard with an example of the Garite. (4) Plummer Tower, in Croft-street, opposite the Free Library. (5) Sallyport Gate, in City-road. The two last are greatly modernised for use as meeting halls of the Incorporated Companies, in whose possession they remain. During the rising of 1745 the Walls and Gates of Newcastle were put into a state of defence to resist the Highland army of Prince Charles—the last occasion of their use in warfare.

CHURCHES.

St. Nicholas, the Cathedral Church of the new Episcopal diocese of Newcastle, founded in 1882. It replaced an Early English structure of a much more ornate character; for, with the exception of the tower and lantern, the existing architectural features are meagre. The arcades spring from plain octagonal columns without capitals. The Nave and transepts are of A.D. 1359, and the Choir of about 1368. The tower and spire, the great triumph of the Church and the boast of the people of Newcastle, are of late work dating circa 1450. Among many interesting monuments within are those of Admiral Lord Collingwood, who was born in an adjacent house A.D. 1748, and a recumbent effigy of the late Dr. Bruce (died 1892), historian of the Roman Wall, and equally eminent as archaeologist and philanthropist.

St. Andrew's, in Newgate-street, contains a chancel arch of transitional Norman A.D. 1175 to 1185, also Early English and later work. It stands just within the town wall, and has suffered much during the sieges of the town. According to tradition, it was without the wall at this part that occurred the challenge from Earl Douglas to Harry Hotspur, which resulted in the battle of Otterburn, the Chevy Chase of the ballad, August 15, 1388.

St. John's, in Westgate-road; some Norman work remains, but the structure is mostly of fourteenth-century work, showing columns without capitals, and in character similar to those of St. Nicholas.

All Saints'; a modern church, built in 1786, on the site of an early structure. It is typical of the classical style in late and decadent development; and the interior presents an example of the eighteenth century abandonment of the outward traditional accessories of religious worship. This extreme plainness has lately given place to some fittings of a modern type. In the vestry is preserved a monumental brass of Flemish workmanship, a relic of the ancient church. It commemorates Newcastle's great merchant adventurer, Roger Thornton and Agnes his wife, with their seven sons and seven daughters. He died A.D. 1430.

St. Mary's, Gateshead; a church greatly modernised. Some Norman work appears in the South Door of the Nave. The remaining parts are of late fourteenth century and more recent periods. It stands near the scene of the murder of Bishop Walcher. The Angles of these parts resisted the Bishop whom William the Conqueror had set over them. As he left the church the cry was raised: "Short rede, good rede; slay ye the Bishop!" (Short counsel's good counsel, &c.). Whereupon Walcher was slain and the church set on fire, May 14, 1080. At the river margin, immediately below the church, is the site of the great fire and explosion which destroyed large portions of Newcastle and Gateshead in 1854.

Sandhill.—Here are illustrations of the domestic architecture of the seventeenth century. Surtees' house is a prominent example of the half

timber construction then in vogue. It is dated A.D. 1657-1658. A mural tablet on its outer face records the fact that it was through a window of this house that Jack Scott, afterwards Lord Chancellor Eldon, eloped with his bride, Bessie Surtees. In the street called the Side, which adjoins, over-hanging buildings of the same period will be noted. In a house in Akenside Hill the poet Mark Akenside was born, A.D. 1711.

The Guildhall.—This is an ancient structure refaced in 1791 and otherwise modernised. It includes the Assize Court of the town and county of Newcastle-upon-Tyne, the Town Chamber, or Mayor's Chamber, the Merchant's Court, containing oak panelling, a carved overmantle, dated 1636, and the names and Heraldry of the various Governors of the Incorporated Company of Merchant Adventurers. The basement is used as the Commercial Exchange—High Change 11.30 to noon, afternoon Change, 3.30 to 4 p.m.

The Trinity House.—Entrance is from Trinity Chare Quayside, or by way of Broad Chare. The Master Mariners, who formed the Fraternity or Gild of the Blessed Trinity, represent an ancient foundation, and the precincts of their House are in keeping with their venerable character. The residences are grouped in a series of quadrangles, and the Hall, Court Rooms, and Chapel contain many objects of interest belonging to the Master and Elder Brethren of this Corporation.

Jesus Hospital, in City-road, east of Pilgrim-street, was built for aged Freemen and their widows. The building is an example of late seventeenth century work. A piazza extends along its entire length and in front is a pant or water fountain.

Keelman's Hospital, eastwards in City-road, beyond the Sallyport Gate; built by the Fraternity of Keelmen at their own charge, A.D. 1701.

The Friars.—From Charlotte-square, or from Low Friar-street by way of Monk-street, access will be found to the cloister-garth of the house of the Dominican or Black Friars. In the church of this house Baliol did homage for the Scottish Crown to King Edward III., on June 19, 1334. The conventional buildings were granted in 1552 to several of the Incorporated Companies of the town, and their meeting places now surround the quadrangle. The Hall of the Company of Smiths is especially interesting; but the locality is dirty and disappointing.

MODERN NEWCASTLE.

Grey's Monument was erected, 1838, to Charles, Earl Grey, in recognition of his Reform Bill of 1832, and surmounted by a statue of the Earl by Baily. From the Monument, as a focus, the chief streets of modern Newcastle radiate. The great structures, all of polished ashlar work, here seen in Grey-street, Grainger-street, Market-street, with the connecting streets, including the Market, Central Exchange, Lambton's Bank, Theatre Royal, and Clayton-street, &c., as well as the Arcade, Eldon Square, Leazes Terrace, and minor streets, were the works of Richard Grainger, and the architects, John Dobson and Benjamin Green. Grainger began the reconstruction of the centre of the town after the year 1832, and is said to have erected a mile and a quarter of new streets in five years.

Central Station designed by Dobson; opened by the Queen and Prince Albert 1849.

Stephenson Monument, Westgate-road, a bronze statue of George Stephenson, by Lough, erected 1862.

High Level Bridge.—By Robert Stephenson, engineer; begun in 1846 and finished in 1849. It is noteworthy as representing the transition from cast iron to wrought iron for structural purposes which followed its erection.

Swing Bridge.—Opened 1876; the central portion is 281 feet long, and 1450 tons. It is raised off the blocks and swung round for the passage of vessels in about a minute and a half.

The Moot Hall.—A massive structure overlooking the bridges from the hill above. It was built in 1810, and here are held the courts for the county of Northumberland.

The Quayside.—There are few more picturesque sights than are here presented in busy times when the long line of deep water berthing is fully occupied. At the eastern extremity the Grain Warehouse is a prominent object. Its machinery and elevators discharge grain in bulk from the steamer's hold, which is elevated, carried, weighed, and distributed to the storage floors of the building at the rate of sixty to eighty tons an hour.

The Town Hall.—This structure faces the Cathedral, and is probably the least esteemed building in the city.

Thomas Bewick.—The workshop of the wood-engraver, whence issued his innumerable "cuts," is in St. Nicholas Churchyard, at its south-east corner. It will be recognised by a wall tablet.

INSTITUTIONS.

Durham College of Science.—Barras Bridge, established 1871, is an offshoot in connexion with the University of Durham. Its chemical, physical, and engineering laboratories are among the finest in the country, and its course of instruction is widely comprehensive.

Medical College, Northumberland-road, is also an institution affiliated with the Durham University.

Rutherford College.—Bath-lane.

Hancock Museum, of the Natural History Society, Barras Bridge, open daily, ten to four. The magnificent Hancock collection of British birds, the mineralogical and geological collections, and the examples of Thomas Bewick's engravings are of special interest.

Literary and Philosophical Society.—Westgate-road, founded 1793; one of the most popular institutions in the city. It has participated in the munificent gifts of the late Robert Stephenson, and of its present President, Lord Armstrong. Its library and lecture courses are its specialities.

Institution of Mining and Mechanical Engineers, adjoining the premises of the Literary and Philosophical Society. The Wood Memorial Hall and Library commemorate Mr. Nicholas Wood, mining engineer, advocate and exponent of George Stephenson's claim for his locomotive in the controversies attending the introduction of railway traction. Died 1865.

Free Library.—New Bridge-street, including a reference library of 50,000 volumes, with branch libraries built by Alderman W. H. Stephenson in Elswick and Heaton Parks.

Young Men's Christian Association.—Blackett-street.

Geographical Society.—Lovaine Hall.

Society of Antiquaries. (See "Castle.")

PUBLIC PARKS AND GROUNDS.

Armstrong Park, Jesmond Dene; *Branding Park*, North-road; *Leazes Park*, Castle Leazes; *Elswick Park*, Elswick and Westmoreland-roads. In the Mansion here are placed the large collection of models of sculpture, chiefly by Lough. The Town Moor and Leazes form the great play-place of Newcastle, extending over an area of between eleven and twelve hundred acres of open country.

Saltwell Park, Gateshead, forms a beautiful adjunct to the sister borough.

Note.—A.D. 1900 marks the five-hundredth year of the city's separate existence, its charter having been granted by Henry IV. in the year 1400.

NOTES ON THE EXCURSION TO HEXHAM AND THE ROMAN WALL.

By J. PATTISON GIBSON.

Members will assemble at the Central Station, leaving by train for Hexham at 10.20 a.m. from one of the western platforms. Half a mile from the station the works of the Elswick Ordnance and Engineering Company lie to the left, and extend towards the river; the railway passes through and alongside of them for over a mile. These works employ over 15,000 men. The railway follows the course of the River Tyne, which it crosses to the south at Scotswood. About two miles beyond, on the north bank of the river, lies Newburn, where General Leslie, with a Scotch army, defeated a small English force, in the time of Charles the First. The great steel works of Spencer & Sons, Limited, are now the prominent objects of the battlefield.

Ten miles from Newcastle, on a commanding knoll, quarter of a mile to the left, stands Prudhoe Castle, the Norman Keep of the Umfravilles. It was often besieged during Scottish invasions, and repulsed an attack made on it by William the Lion, King of Scotland, 1174 A.D. After passing Prudhoe the colliery smoke is left behind, and the line passes through a fertile and beautiful agricultural district. On emerging from a tunnel, Corbridge, the Roman Costopitum, is seen half a mile distant on the right, with its mediæval bridge, which alone, of all the numerous bridges on the Tyne, withstood the great flood of 1771 A.D. On the left, about the same distance from the railway, Dilston Castle stands on the steep banks of the picturesque Devil's Water. It was the residence of James the Third and last Earl of Derwentwater, the popular hero of Northumbrian romance, who was beheaded for his share in the rebellion of 1715. Three miles beyond, Hexham stands on a plateau elevated about 100 feet above the level of the river, from which it is separated by a belt of haughs, covered with nursery and market gardens. Its foreign-looking sky line shows prominently its three oldest buildings—the Abbey Church, the Manor Keep, and the Moot Hall, formerly the Court House of the Archbishop of York, to whom the Manor and Regality of Hexham belonged. Early British and Roman remains have

been found on its site, but the town itself sprang into importance when Etheldreda, the Queen of Elfrid, in A.D. 671, gave it, along with many adjacent lands, to St. Wilfrid to establish a bishopric and found a monastery. The bishopric ceased in A.D. 814, being merged in that of Lindisfarne. The only part remaining of St. Wilfrid's Church is the underground crypt. It lies below the present church, of which the choir was commenced about A.D. 1200, and the transepts completed about A.D. 1240, the work in them being pure Early English. The Early Saxon church had been repaired, and remained in use as the nave. The erection of monastic buildings was carried on during the thirteenth century—a fragment of beautiful early decorated work, forming part of the lavatory, still remains in the cloister square. In 1296 a Scottish army, under the savage Earl of Buchan, burnt and destroyed the abbey, the monastic buildings, and the school, in which 200 scholars had been fastened up.

Scottish invasions and border raids made Tyneside a lively place of habitation until the seventeenth century, no man of substance in it knowing, when he went to rest at night, whether he might awake ere morn to find his cattle driven off, his people slaughtered, and his pele tower in flames. In 1536, although the Austin Canons, who held the abbey, at first resisted by force the commissioners sent down by Henry the Eighth, and initiated the rebellion known as "The Pilgrimage of Grace," they were finally driven out by the Earl of Norfolk, and their lands and goods were sequestrated.

Until the first half of the present century hatting, gloving, and tanning were the leading industries of the town; the introduction of the silk hat and the kid glove destroyed the two former, and three only of its numerous tanneries now remain. Among the most notable objects inside the abbey church are the tombstone of a standard-bearer of Roman cavalry, the Saxon Frith Stol or Chair of Sanctuary, the night stair leading from the dormitories into the south transept, the wooden food-loft, with its screen of flamboyant woodwork, which is the only one remaining in any English monastic church, and the quaint chapel and tomb of Roland Lescman, one of the fifteenth century priors.

In driving to the Roman camp at Walwick Chesters, the road crosses the South Tyne by the suspension bridge at Warden, and follows the valley of the North Tyne, passing St. Michael's, an early English church at Warden, with a tower of Saxon masonry, and climbing Warden Hill, which, on its western flank, has a large early British camp.

Walwick Chesters, the Roman Cilurnum, lies on the west bank of North Tyne, and is the sixth camp on the line of the Great Wall, counting from its east extremity at Wallsend. It was garrisoned by an ala of Spanish cavalry. There are remains of its six gateways, and the foundations of the Pretorium and many of the streets have been excavated and cleared. Between the Camp and the river are the ruins of a Roman villa, some of the walls of which are still ten feet high.

NOTES ON DURHAM CITY.

The chief town of the county of Durham is situated on the river Wear, about fourteen miles south of Newcastle. It dates from the tenth century, when the monks of Lindisfarne rested there with the body of St. Cuthbert, after their long wanderings in the north of England. Soon after, a church was built, and the removal of the See from Lindisfarne, together with the growing fame of the body of St. Cuthbert, led to the rise of the city.

The church stands some eighty feet above the river, on a rocky peninsula, which was called Dunholme (Hill Island), whence Durham. In 1093 Bishop Canleple commenced to rebuild the Cathedral, and his grand Norman work, and that of his successor, Flambard, yet exists as the main part of the building; but, of course, numerous additions and alterations have been made, the chief of which are:—

The Galilea, or Western Chapel, built by Bishop Pudsey, 1153–1195. This is a fine transitional Norman work, and is very similar to that of the chapel in the Keep, Newcastle-upon-Tyne.

The Nine Altars, or Eastern Transepts, Early English, 1242–1280, which contained the shrine of St. Cuthbert, who is buried here.

The Central Tower, Perpendicular, 214 feet high; the upper portions of the western towers; several decorated and perpendicular windows, &c. On the door of the north porch the Sanctuary Knocker recalls how the church once interposed between the aggressor and the avenger. It consists of a fine grotesque head, with large ring in the mouth serving as knocker, and probably is contemporary with the door itself. Having entered the nave by this door, looking towards the east, we have before us a vista of the noblest and most impressive of the Norman churches in England.

Stretching across the nave between the piers, just west of the north and south doors, there is a line of dark-coloured Frosterley marble, with two short limbs at the centre, forming a cross. Eastward of this no

woman was allowed to go, for St. Cuthbert is said to have had a more than usual monastic dislike to women, and it was thought that to have allowed them nearer his shrine would be distasteful to him. The Chapter House has been recently restored as a memorial to the late Bishop Lightfoot. The banks of the Wear below the Cathedral are crossed by four bridges, and innumerable photographers find on them a happy hunting-ground.

The Castle, founded by William the Conqueror, 1072, upon the neck of land guarding the approach to the Cathedral, was for long the chief residence of the Bishops of Palatinate, but is now appropriated by the University, with the exception of some State apartments, which are reserved for the Bishop and Her Majesty's Judges. The Great Hall is one of the finest in the kingdom.

NOTES ON ALNWICK.

Alnwick (town on the Aln), the county town of Northumberland, is about thirty-eight miles north of Newcastle by rail.

To the right, on leaving the station, will be noticed a column, called "Farmer's Folly," eighty-three feet in height, erected by the tenants of the second Duke in 1816, in return for a remission of rent during a period of agricultural depression. Further on we pass through Bondgate, built in 1450, now the only one of the four gates of Alnwick remaining, and along Bondgate Within to the main attraction of Alnwick,

The Castle, which was founded by Ivo de Vesci, who became Baron of Alnwick in 1096. After many vicissitudes it was almost entirely rebuilt by the first Percys between 1310 and 1350, and was for long chief of the border strongholds. It was besieged by Malcolm Canmore, who was killed before its walls. David I. captured it, and William the Lion was here taken prisoner. In 1854 it was restored at the cost of nearly 250,000*l.*, but yet remains one of the finest baronial structures of England. The curtain wall, defended at intervals by towers, encloses an area of about five acres.

Entering by the *Barbican* (1315), one is at once impressed by its grandeur and massive strength. On the battlements may be seen some quaint stone figures, commonly supposed to have been taken by the enemy for watchmen.

The Keep, part of which dates from 1350, consists of a number of towers surrounding an inner court, upon entering which, to the right, there is a curious well, which descends in the thickness of the wall. A wooden axle crosses above it, with wheels at each end set round with pegs for winding up the water buckets.

Descending a steep hill from the Barbican to the river, we come to the *Lion Bridge*, built in 1773. It derives its name from being surmounted by the Percy Lion, with poker tail. From here a fine view of the Castle may be obtained.

In the beautiful parks beyond are the ruins of *Alnwick Abbey*, founded in 1147, of which little remains but an outline of the foundations and the gatehouse.

A fine drive leads to the ruins of *Hulne*, a small Carmelite Abbey, built about 1240.

THE SPECTACLE-MAKERS' EXAMINATION.

DR. G. LINDSAY JOHNSON writes us as follows:—"As it might be interesting to your readers to know the kind of questions, which are set by the examiners at the Spectacle-makers' examination for the certificate, I beg to enclose a copy of the questions relating to "general optics," and "special subjects," which have just been put before the candidates." The following are the questions kindly sent us by our esteemed correspondent.

WORSHIPFUL COMPANY OF SPECTACLE-MAKERS.—EXTRA EXAMINATION.

SPECIAL SUBJECTS.

Wednesday, May 30, 1900. Time 8.30—10.

The candidate may select any one of the four subjects he pleases, but only one set of questions is to be answered.

Photographic Optics.—1. Describe with a sketch the general arrangement of a tele-photographic lens. Why does a change in the distance between the front and back components alter the magnification of the lens?

2. How would you find the focal length of a single meniscus lens? What would be the equivalent focal length of a rectilinear lens the front combination of which is 6·5 inches, the back combination 6 inches, and the distance between the centres 0·75 inches.

3. Landscape lenses are usually arranged with the concave side outwards and the stop in front of the lens. Give a diagram to show (a) how, if there were no stop, an oblique pencil would not form a sharp image. (b) How, if the stop were placed behind instead of in front, it would fail to remedy the bad definition at the margins.

Microscope.—1. Explain exactly what you understand by multiple

colour illumination, and by dark ground illumination. How can these effects be obtained and in what cases are they useful?

2. What is meant by the numerical aperture of a lens? How does it differ from the angular aperture? Three lenses, a dry objective, a water immersion, and an oil immersion have each an angular aperture of 100° , what is the N.A. of each of them ($\sin 50^\circ = 0.766$)?

3. Explain by means of a diagram the action of a screw collar adjustment to an objective. State how and when it is to be used and the effect the rotation of the collar has on the image.

Surveying and Nautical Instruments.—1. Describe a Gunter's chain in detail. What tests would you make to ascertain whether the length is correct?

2. The mirror of a sextant is sent you to ascertain whether its surface is a true plane. Describe the methods you would adopt to find this out.

3. Describe the prismatic compass, and state what it is used for and how you would use it.

Projection.—1. State very clearly what it is that the condensers of optical lanterns are required to do; or, in other words, state the precise optical problem to be solved in the design of lantern condensers. Also explain by help of sketches how in good modern lanterns these requirements are fulfilled.

2. Describe with sketches an arrangement for projecting objects or slides that are laid horizontally instead of being set vertically as slides ordinarily are.

3. Solve the following problems:—

(a) A lens of 6 inches focal length is placed $6\frac{1}{2}$ inches from a luminous disc $3\frac{1}{2}$ inches in diameter. At what distance will the image be formed and what will the size be?

(b) It is required to form on a screen an image, 9 feet in diameter, of a luminous disc $3\frac{1}{2}$ inches in diameter. The distance of the screen from the lens being 32 feet, what must be the focal length of the lens, and how far from the lens must the luminous disc be placed?

GENERAL OPTICS.

Wednesday, May 30, 1900. Time 7-8.30.

1. How would you distinguish between a shadow and a reflection; for instance, of a tree standing at the edge of a still pond?

2. Explain why it is that in using an ordinary convex lens as a magnifying glass the object you are examining must be placed nearer to the lens than the principal focus of the latter. Give a sketch showing this.

3. If you look through the large end of an opera glass, objects appear much smaller and further away than when seen by the eye alone. Explain by means of a sketch why this is so.

HEAT.

1. What do you understand by the term "coefficient of expansion of gases?" If 46 cubic inches of air measured at freezing point expand to 50.6 cubic inches when warmed to $78^\circ F.$ at constant pressure, what is the coefficient of expansion of air per degree Fahrenheit?

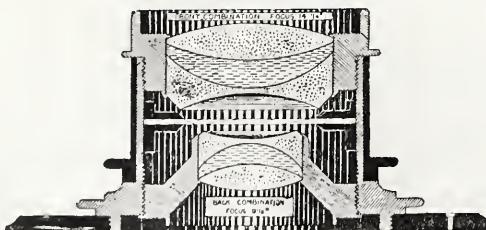
2. Mention three different ways in which heat can pass from a hot body to a colder one; give an example of each, and point out what is the distinction between the three methods.

3. Travellers sometimes ascertain the height of a mountain by placing a thermometer in boiling water when at the summit. Explain the rationale of this experiment, and state how you would conduct it yourself.

THE NEW BECK-STEINHEIL CONVERTIBLE ORTHOSTIGMAT.

MESSRS. R. & J. BECK, of Cornhill, are now in a position to place on the market a series of orthostigmats hitherto unknown, either in this country or on the Continent, of which they send us the following particulars:—

The orthostigmatic lenses which Messrs. Beck manufacture under licence from Messrs. C. A. Steinheil Sohne, have, up to the present, been merely issued in this country as a very rapid symmetrical doublet, each of whose combinations can be used separately as a perfectly corrected landscape lens of about double the focal length of the original, but



each combination has the same focal value. Having this principle used in the construction of the Orthostigmats, Series I., as a basis, lenses can be constructed of either two similar halves (the Orthostigmats, Series I.), or two similar, but not symmetrical, halves, as in the case of the new series of lenses which Messrs. Beck, of Cornhill, are now placing on the market under the name of the Beck-Steinheil convertible Orthostigmats, Series II. The new series is so compiled that, while allowing of a great

range of foci, it, nevertheless, possesses a rapidity of from $f\cdot7$ to $f\cdot7\cdot7$ in the case of the complete combination, and of $f\cdot12\cdot5$ in the case of the single combinations. Any lens of this new series is really four lenses in one, and therefore universal.

(1) When the two combinations are used together at full aperture, they become a very rapid doublet.

(2) When the doublet is used with a small stop, it becomes a wide-angle lens.

(3) When the front combination is used alone it becomes a perfectly corrected landscape lens of a longer focus than the original.

When the back combination is used alone it becomes a landscape lens, perfectly corrected, of a longer focus than the original, but shorter than the front. The front combination must always be screwed into the back for use. To give a concrete example of this remarkable lens Messrs. Beck cite the performance of the No. 3B, Series II.; as a whole it is a doublet of about 6 inches focus working at $f\cdot7\cdot7$; when stopped down it will cover a plate 9 by 7 inches, giving an angle of about 87° degrees. The front combination is of about $1\frac{1}{4}$ inches focus, and the back of about $9\frac{1}{2}$ inches focus, each of these simple combinations, moreover, will cover a much larger plate than that for which they are listed, thus becoming wide-angle lenses for landscape work. The variety of the range in the application of a really high-class landscape lens of the single type is not



very widely appreciated; but for landscape, pure and simple, many photographers give them the preference, as they produce the most brilliant and evenly illuminated pictures. For seascapes, again, they are most suitable, and even for architecture, when a moderate angle only is required, they can be used with eminent success. Of late years also single lenses have become deservedly very popular, for portraiture and the half-combinations of the larger Orthostigmats may be used with great success for large figure studies. The reason for the popularity of the single lens is, no doubt, partially due to the low price of this form of lens as compared with the doublet, together with lightness and portability; also the fact that, when used at extreme apertures, there is a certain softness of result in the modelling which cannot be obtained with the anastigmatic doublets.

The optical qualities of this new Beck-Steinheil Orthostigmat are similar in all respects to the Series I. The mount, it might be added, is clearly engraved with the three foci and the various standard diaphragm numbers for each separate use of the lens. The lenses are also adapted for all hand-camera work, and can be fitted to almost every camera in the market.

The Orthostigmats are issued in nineteen sizes, varying from $3\frac{1}{2}$ focus to $23\frac{1}{2}$ inches, and covering plates from $3\frac{1}{4} \times 3\frac{1}{4}$ inches to 28×28 inches.

PLYMOUTH EXHIBITION.

THOUGH the Plymouth Photographic Society has had an existence of six years, and has held several exhibitions, they have hitherto been members' shows. On Wednesday, May 23, an Exhibition was opened in the spacious gallery of the Plymouth Institution—the Athenaeum—at which there were classes for members and open classes. This was quite a new departure for the Society, but it proved to be a very excellent one and most encouraging for the members, who could thus compare their work with that of outsiders, though it may be said that the best-known contributors to photographic exhibitions were not in strong force.

There were, however, examples from workers who will, no doubt, in coming days, be heard of. The work of the local men was of higher grade than they have hitherto risen to, and it is likely that they will still improve with such incentive as was given them at the Exhibition. Plymouth and the district has plenty of amateur photographers, but they are not much known as exhibitors, which is a pity, because they must have secured many charming pictures in a district where the scenery is beautiful and in many cases striking. The Exhibition consisted of about four hundred frames and a good lot of lantern slides. The general average of the prints and slides was of excellent quality, and the Judges were complimentary in their references to them. They were Dr. P. H. Emerson, Dr. Chas. Aldridge, and Mr. W. H. Babbe (Head Master of Plymouth School of Art). An advantage in the trio was that all were acquainted with photographic work, and two were artists of reputation in the West of England.

The following is the list of awards:—

Class A (Landscape, Seascapes, and River Scenery).—Silver medal, A

Hazy Morning (31), W. Grist; bronze medal, *A Devon Estuary* (74), D. Adair; certificate, *The Promenade, Kingsbridge* (84), W. H. Mayne.

Class B (Figure Studies).—Silver medal, *In Doubt* (132), C. H. Dymond; bronze medal, *Betty* (117), G. F. Treleaven; certificate, *One of the Olden Time* (125), H. J. Hissett.

Class C (Architecture).—Bronze medal, *Ruins, Okehampton Castle* (144), W. H. Mayne; certificate, *Prior's Doorway, Ely* (155), E. G. Turney.

Class D (Enlargements).—Silver medal, *Trawlers, Sutton Pool* (211), W. Grist; bronze medal, *Hereford Bridge and Cathedral* (189), F. E. Turney; certificate, *The Wetterhorn* (191), T. J. Dunstan.

Class E (Lantern Slides).—Bronze medal, C. H. Dymond; bronze medal, W. C. Johns; certificate, F. Johnson.

The foregoing are Members' Classes.

Class F (Landscape, Seascapes, and River Scenery).—Silver medal, *Resting* (235), E. A. Price; bronze medal, *Victims of the Cornish Coast* (226), W. H. Harrison; bronze medal, *A Moorland Hut* (245), T. Allworth Courts; certificate, *Joe's Ship* (217), Graystone Bird.

Class H (Architecture).—Silver medal, *In Wirksworth Church* (272), W. R. Bland; bronze medal, *Capital in Chapter House, Southwell Minster* (285), A. J. Loughton; certificate, *Crypt, Gloucester Cathedral* (270), S. A. Pitcher.

Class G (Figure Studies).—Silver medal, *Catching the Breeze* (335), T. A. Sands; bronze medal, *A Colonial* (307), W. H. Harrison; certificate, *When Eyes grow Dim* (346), F. G. Tryhorn; certificate, *A Village Worthy* (353), J. B. MacLachlan.

Class G (Still Life).—Silver medal, *Fruit Study* (339), J. M. Whitehead; bronze medal, *Gladioli* (352), Miss MacLachlan.

Class I (Lantern Slides).—Silver medal, A. T. Crane; bronze medal, Graystone Bird; certificate, J. Gunston; certificate, A. E. Smith.

Class J was devoted to pictures not for competition, and these were contributed to by the members in a most praiseworthy way, as well as by some other well-known workers. It is clear that, from the good beginning made by the Society in attracting outsiders, in future years more will be found to contribute to the Exhibition, and the Society has the duty thrust upon it of working up the West country generally to attempt high-class photographic pictorial work. The Exhibition was continued on Thursday and Friday, May 24 and 25 respectively, concluding with a *conversazione* on the evening of the last-named day. This was a very enjoyable function. During the evenings of the Exhibition lantern-slide exhibitions were given, and the attendance was good throughout the whole of the proceedings. On the first day the Judges and some of the officers of the Society lunched at the Duke of Cornwall Hotel, at the invitation of the President, Mr. H. S. Hill, M.J.I., who has always been very hearty in his support of the Society, and who has done much to help its progress and success. Those who had worked assiduously to bring about this first open Exhibition of the Society are to be congratulated upon the result of their efforts, and it is to be hoped that the work begun may be continued without break, so that so important a district may rely upon having an exhibition of good quality and excellent proportions at least once a year, and it is clear that the choice of date was rather happy than otherwise.

Our Editorial Table.

A PROFIT AND LOSS CHART.

MR. ARTHUR PAYNE, F.C.S., of Newcastle-on-Tyne, sends us a copy of a little book entitled "Profit and Loss Chart, for the use of works managers and others interested in the profitable conducting of a factory." Briefly, by the aid of the system of charting recommended by Mr. Payne it may be seen at a glance how a factory is paying. Works managers should find the book of the greatest assistance. It is published at the price of one shilling by Messrs. Percy Lund, Humphries & Co., the Country Press, Bradford.

VERSCHIEDENE REPRODUCTIONS-VERFAHREN.

By August Albert. Wilhelm Knapp, Halle a/S.

WITHIN the compass of 180 pages, Professor August Albert of the Vienna Technical School, gives a valuable treatise on the numerous applications of photography and similar processes to illustrations. The work deals especially with lithographic and typographic printing, and particularly with photo-mechanical work. Although many obsolete processes have been purposely omitted, Professor Albert has been careful to include those which may be of importance to the student. The subject is treated theoretically and historically and numerous illustrations assist the reader in forming an opinion of the advantages and limitations of the many processes described.

THE YEAR Book OF PHOTOGRAPHY FOR 1900.

Edited by E. J. Wall, F.R.P.S., 647 pp., price 1s. London: The Photographic News, 9, Cecil Court, Charing Cross-road, W.C.

THERE is one article in the *Year Book* which is worth the shilling charged for the entire volume. We allude to that headed "P.O.P. by the Editor." In the course of considerably over a hundred pages Mr. Wall deals with the history of gelatino-chloride paper; the various

methods of making the emulsion, printing, toning, fixing and washing, development, &c. The article is a perfect storehouse of information on the subject, and as a piece of painstaking compilation does the author the highest credit. In our opinion it is worth reprinting and issuing in separate form. Besides many half-tone illustrations the *Year Book* contains articles on "Pictorial Composition," by J. T. Ashby; *Lantern Slide Making*, by Mr. Vivian Hyde; "The Photographer's Gazetteer," by the Editor; a section devoted to "Novelties of the Year," formulae, tables, &c., and other information. The *Year Book* for 1900 is every bit as useful and readable as its predecessors and should be popular with the large class to which it appeals.

Studio Gossip.

"PEACE WITH HONOUR."—An amusing story is told in *Macmillan's Magazine* in connexion with Disraeli's famous phrase, "Peace with Honour." In the course of a political lecture, illustrated with a magic lantern, in a country village, portraits of Lord Beaconsfield and Lord Salisbury, with the words "Peace with Honour," were thrown upon the screen. An old lady among the audience, whose head was full of recollections of a notorious criminal, innocently remarked, amid great laughter, "Which is Peace?"

SIR HENRY IRVING AND THE OXYGEN TREATMENT.—The celebrated actor, who recently returned from the United States, remarked to an interviewer: "Happy is the theatrical company that has no tale of mishaps. We met with nothing unusual. I was once the victim of a gentleman, who, emulating Sherlock Holmes, had published the startling report that I was only kept alive by copious libations of oxygen. He happened to see outside the theatre some fifty or sixty cylinders which were used for the limelight, and asserted that when I had finished my lines I was rushed off the stage to my dressing-room and there subjected to these draughts! He naively remarked that even the key-hole of my room had been stopped! I should add that the reason we carried our limelight about with us was because in some theatres there is no preparation made for its use."

News and Notes.

THE "DAILY TELEGRAPH" WAR FUND.—We have received the following additional sums for this fund:—Mr. G. R. Baker, 5s.; Mr. J. W. Tourtel, Fowey, 2s. 6d.

THE SIEGE OF KIMBERLEY.—At the Camera Club, on Monday next, June 11, Mr. G. M. C. Luard (Reuter's correspondent) will give an illustrated lecture on "The Siege of Kimberley."

THE NEWCASTLE CONVENTION.—There will be a meeting of the Council at Anderton's Hotel, Fleet-street, London, E.C., on Wednesday, June 13, 1900, at six o'clock. The following is the agenda: To discuss the final arrangements for the Newcastle meeting; the nomination of members for the new Council; general business.

A ROYAL PATRONESS.—The Princess of Wales has consented to become the Patroness of the Alexandra Camera Club, Grimsby, a private organization of some dozen amateur photographers in the town. Mr. T. M. Williams (Port-Master) is the President, and Mr. W. H. Marris the Secretary *pro tem*. The Club is limited in membership.

THE General Architectural Congress begins on the 18th inst., and the Royal Institute of British Architects will give a *conversazione* in connexion with it on the 19th at Guildhall. As it is proposed to hold at the same time an exhibition of architectural drawings and photographs, there ought to be a good attendance of architects, artists, and students.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, June 12 at 66 Russell-square, at eight p.m. Mr. H. L. Aldis, B.A. (Cantab.), will read a paper entitled, "The Construction of Photographic Objectives—Mathematical Investigation." The exhibition of photographs by Dr. P. H. Emerson, may be viewed on presentation of visiting card, between the hours of ten and four; Wednesday, ten to eight.

AN EXTRAORDINARY NEWSPAPER.—The most up-to-date of all modern newspapers is the *Stereo-Revue*, published in Paris. This extraordinary newspaper gives the news of the day, or rather week, not in type, but in instantaneous photographs on a film like that of a cinematograph. A bobbin of this film is the journal, and the subscriber puts it through a portable stereoscope like a field glass, and looks at the pictures.—*Home Chat*.

HALF-TONE AT THE PARIS EXPOSITION.—*Process Work* states that the Paris photo-engravers have adopted a very good plan. They have formed themselves into a little syndicate, and make a joint exhibit, which promises to be very effective. There was some talk of one of the exhibits being a wondrous large half-tone block, made by joining together a number of negatives, and said to exceed in size anything ever before attempted.

ENTRIES will shortly close for the Ladies' Kennel Association Show, in the Royal Botanic Society's Gardens, Regent's Park, London. The large sum of 6000l. is offered in prizes for ladies' dogs, cats, poultry, pigeons, cage-birds, and ladies' amateur photography. The Show is limited to ladies, but not to members. H.R.H. The Duchess of Connaught is the President of the Association, and takes a keen personal interest in its welfare. Further particulars may be obtained from Mrs. Stennard Robinson, the Hon. Secretary, 5, Great James-street, London, W.C.

AN alarming fire broke out at one o'clock on Saturday, at the Photographic Studio and Cycle Works of Mr. Gude, High-street, Maidenhead. The outbreak was caused by the ignition of benzine vapours from the cycle works, on the lighting of a gas stove in the kitchen, and the whole of the back of the

premises was soon in a blaze. Mr. Gude, in endeavouring to check the fire, was seriously burnt on the arms, hands, and face, and was in a state of collapse when assistance arrived. Fortunately, Dr. Noble Smith, a London physician, was passing on a bicycle, and he rendered valuable surgical aid. Great damage was done by the fire, notwithstanding the efforts of the local fire brigade, but the adjoining premises were fortunately saved.

PHOTOGRAPHING IN CHINA.—It would seem, according to an evening contemporary, that the "heathen Chinee" is not in favour of photography when he knows it as such. The paper says that Mr. Ernest Hatch, M.P., has been working a cinematograph in Pekin, "and that the Celestials gathered round in silent adoration while the film was passing the lens; but, when two Germans came along with an ordinary camera, the Chinamen smashed it." Of course, we do not vouch for the accuracy of the report, but, if it be true, it seems that China is not a desirable place for amateur photographers to visit with their cameras. We know, however, that Mr. J. Thomson, some twenty years ago, did secure a fine lot of photographs in the Celestial Empire, with which he illustrated his work on China, and we do not think he met with much opposition while working.

THE GREAT TELESCOPE AT THE PARIS EXPOSITION.—"A picturesque ceremony," says the Paris correspondent of the *Daily Chronicle*, "took place on Monday at the Palais de l'Optique. Mgr. Lorenzelli, the Papal Nuncio, accompanied by his auditor and secretary, who was received by M. Francois Deloncle, the Abbé Odelin, representing Cardinal Richard, the Directors of the Paris and Meudon Observatories, Prince Henry d'Orléans, and Prince Roland Bonaparte, formally blessed the 'Siderostat,' or monster telescope, according to the ritual of the 'Angelic Teacher,' Thomas Aquinas. The prelate, who stood at the foot of the telescope, clad in rich vestments, with mitre and crozier, preached an eloquent sermon on the growing harmony between science and revealed religion. The benediction was then pronounced, and the 'Siderostat' was shown to those who had been invited."

ANCIENT SUN-DIALS.—"It is probable that the earliest sun-dial was simply the spear of some nomad chief, stuck upright in the ground before his tent. Amongst those desert wanderers, keen to observe their surroundings, it would not be a difficult thing to notice that the shadow shortened as the sun rose higher in the sky, and that the shortest shadow always pointed in the same direction—north," says Mr. E. Walter Maunder in *Knowledge* for June. "The recognition would have followed very soon that this noonday shadow changed in its length from day to day. A six-foot spear would give a shadow at noonday, in latitude 40°, of twelve feet at one time of the year, of less than two feet at another. This instrument, so simple, so easily carried, so easily set up, may well have begun the scientific study of astronomy, for it lent itself to measurement, and science is measurement; and probably we see it expressed in permanent form in the obelisks of Egyptian solar temples, though these, no doubt, were retained merely as solar emblems ages after their use as actual instruments of observation had ceased. An upright stick, carefully plumbed, standing on some level surface, may therefore well make the first advance upon the natural horizon. A knob at the top of the stick will be found to render the shadow more easily observed."

THE BADMINTON COMPETITIONS.—The proprietors of the *Badminton Magazine* (published by Mr. W. Heineman, Bedford-street, Strand) offer a prize of ten guineas each month for the best original photograph sent in representing any sporting subject. Ten other prizes will also be given away each month, each of them consisting of an original drawing by one or other of the artists who illustrate the magazine. The following are the conditions: Good, clear pictures are, of course, necessary, and, when possible, the negative should be sent as well as the print. Competitors may also send any photographs they have by them on two conditions: that they have been taken by the sender, and that they have never been previously published. A few lines explaining when and where the photographs were taken should accompany each negative. Residents in the country, who have access to shooting parties, or who chance to be in the neighbourhood when hounds are running, will, doubtless, find interesting subjects, and these will also be provided at football or cricket matches; wherever golf, cycling, fishing, skating, polo, athletics are practised. Racing and steeplechasing, including hunt meetings and point-to-point contests, should also supply excellent material. All matters of public-school interest will be welcome.

ANOTHER "NEW" PHOTOGRAPHIC DISCOVERY.—The new discoveries in connexion with photography that from time to time appear in the lay press are really amusing to photographers. On Saturday last the *Daily Mail*, in all seriousness, published a communication from its own correspondent at Rome, under the date May 29, that "Captain Gentili, an Italian officer, who has been experimenting in long-distance photography, has discovered (the italics are ours) a means of taking photographs at a distance of twelve miles. By this means it has been possible to photograph fortresses from a distance of eleven miles, and masses of troops at a distance of nineteen miles." It is added that the Captain's invention is likely to become of considerable importance from a military point of view. Evidently the *Daily Mail*, or its own Rome correspondent, and, possibly, the gallant inventor, have never heard of the telephoto lens, which, thanks to Mr. T. R. Dallmeyer, has been in the market for some years now, and its results are well known. However, this "new" discovery of the Italian officer will, doubtless, go the round of the lay press, and professional portraitists will, no doubt, be duly informed of it by their sitters, as they are and have been for generations past, of the "new invention for taking photographs in natural colours."

Commercial Intelligence.

"I. C."—*Photographic Scraps* for June contains the following mysterious paragraph: "We shall have something new to put before you next month. If you are interested, and want to have an early advice, send us a post card with the letters—I. C.—and your address on, and we will forward full particulars at the earliest moment."

THE AUSTRALASIAN PHOTOGRAPHIC REVIEW.—states that on Thursday evening, April 5, at Rubira's Cafè, Sydney, N.S.W., some sixty *employés* of the firm of Baker & Rouse, Limited, gave a presentation and farewell dinner to Mr. and Mrs. Baker and Miss Shaw, prior to their departure on an extended tour of the "Old Country." The house party consisted of the guests of the evening, Lady Brown and Mr. A. C. Shaw. The affair was in every way a success, and speaks well for the popularity of the head of the firm. The Chairman (Mr. Trowbridge), in proposing the toast of the evening, "Our Guests," referred to his first business with Mr. Baker fifteen years ago, and contrasted the business of that time with the present. He congratulated Mr. Baker on his untiring energy and perseverance in building up the Company to its present eminent position. He further remarked that, while Mr. Baker was most enthusiastically loyal, he never lost sight of the idea of Australia, for the Australians, as shown in a practical way, by his building and fitting, on unique lines, a huge factory at Abbotsford to enable them to supply the trade with Australian-made goods of every description. In replying, Mr. Baker spoke with evident feeling, and, in thanking the company for the reception they had given him, he hoped when he returned he would find all the old hands still with him, and, if he picked up any ideas that proved useful and profitable in the business, the whole of the *employés* would benefit thereby. The Victorian *employés* presented Mr. Baker with a gentleman's travelling case handsomely fitted. On behalf of the N.S.W. and Queensland *employés* a gold albert. The Chairman read a telegram from the Adelaide house sending congratulations and good wishes. Mr. Baker gave a garden party to the *employés* at Yarra Grange, on March 31. Nearly the full strength were present and had a very pleasant afternoon, all kinds of sports being indulged in until tea time, when refreshments were served on the lawn. An adjournment was then made to the house, and the balance of the time was filled up with music. Mr. Baker addressed a few kindly words, and said he hoped that everything would go on smoothly during his absence, and on his return he would find all the hands in their usual places.

Patent News.

THE following applications for Patents were made between May 21 and May 26, 1900:

FLASHLIGHT APPARATUS.—No. 9527. "Flashlight Apparatus for Photographing Purposes." S. D. ALTER and L. T. YOUNG.
HALF-TONE NEGATIVES.—No. 9447. "Improvement in Processes of Producing Half-tone Negatives." Complete specification. G. D. ROCKWOOD.
CAMERAS.—No. 9564. "Improvements in Photographic Cameras." S. N. TURNER and F. H. KELLY.
SHUTTERS.—No. 9578. "Improvements in Shutters for Photographic Cameras. Complete specification. J. S. WRIGHT and C. S. GOODING.
STEREOSCOPIC PHOTOGRAPHS.—No. 9672. "Improvements in the Method of Producing Stereoscopic Photographs and in Mechanism therefor." A. H. DUNNING.
CINEMATOGRAPHS.—No. 9739. "Improvements in or relating to Kinematographs and like Photographic Serial Apparatus." H. SCHMIDT and W. HAENSCH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
11.....	Camera Club.....	<i>The Siege of Kimberley.</i> G. M. C. Luard.
11.....	Southampton	Print Competition: <i>Portraiture.</i>
12.....	Aintree	{ Royal Photographic Society's Paper: Flower Photography.
12.....	Birmingham Photo. Society	{ Demonstration: Uses and Advantages of the Cristoid Films. J. T. Sandell.
12.....	Croydon Microscopical	{ Excursion: Beddington. Leader, H. C. Collyer.
12.....	Hackney	{ Practical Photography in the Field. G. T. Harris.
12.....	Royal Photographic Society	{ The Construction of Photographic Objectives: Mathematical Investigation. H. L. Aldis, B.A.
14.....	London and Provincial	Paper by E. T. Wright.
15.....	Southsea	Paper: Defects and their Remedies.
16.....	Borough Polytechnic	{ Excursion: Round the Nore Lightship. Leader, R. R. Rawkins.
16.....	Brentford	{ Excursion: Cobham. Leader, S. E. Bonfellow.
16.....	Croydon Camera Club	{ Excursion: Godstone and Tanridge. Leader, Mr. Holland.
16.....	Croydon Microscopical	{ Excursion: Caterham, Godstone, and Tilburstow.
16.....	Liverpool Amateur	{ Excursion: Chirk and District. Leader, T. E. Corney Wilson.
16.....	West London.....	Excursion: Hayes Common.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 31.—Mr. T. E. Freshwater in the chair.

Mr. J. E. HODD spoke favourably of the newly introduced Pyrax, or pyro in crystals. In this form an ounce could be contained many times in the old blue bottle that we were accustomed to, and the welcome reduction in bulk which the crystalline form permitted would be most convenient. It dissolved very quickly, and behaved altogether in a satisfactory manner.

Mr. J. W. HODGES read a few notes on elementary

PHOTOGRAPHIC OPTICS.

His remarks, which were illustrated with diagrams and formulæ, touched

upon the diaphragms of photographic lenses, the two principal systems of their measurement and numbering, and relative exposures. He concluded that a system like the U.S. system, which did away with all calculation and gave the relative exposures at a glance, was to be preferred to any. Many instruments really so marked, however, had no evidence that they were marked according to the system, the result being that people often misread them for the *f* numbers, and erred in exposure accordingly. He next alluded to depth of focus, a quality entirely dependent on the size of the aperture, although often said to be possessed more by lenses of particular construction than others. It has been claimed that the newer lenses possess this quality to a greater extent than the older forms, but in reality there is more depth of focus, if such it can be called, with a poor lens. Attention was next given to the determination of the distance which a near object must be removed from the lens in order that its image may be defined on the screen at the same time as objects at infinity; several measurements with a lens of five-inch focus with different stops were given. It appeared that, working at *f*-8 and set for infinity, objects up to twenty-six feet would be in focus, yet focussing scales were generally marked thirty feet, one hundred feet, and then infinity, with a considerable distance between the figures. One maker went to the extent of marking the scale one hundred yards, half a mile, &c. Mr. Hodges described the methods of finding the positions of object, lens and screen for enlarging, copying or reducing, passing on to a few words upon the modification of the focus of a lens by the use of supplementary lenses, or magnifiers, as they are often termed.

Mr. R. CHILD BAYLEY disagreed with the reader of the paper in his definition of the best system of numbering diaphragms as the U.S. system. The fact of the popularity which the *f* system enjoys amongst the more thoughtful of photographers was sufficient proof, on the principle of the survival of the fittest, that it was better fitted than a system based on an arbitrary unit which had to be remembered.

Mr. A. MACKIE said that the unit *f*-4 was chosen because at the time it was the common rapidity of the portrait lens—there was a great majority of portrait photographers in those days over others, and that was the reason for the choice.

Mr. P. EVERITT criticised the R.P.S. system of diaphragm numbering by which the focus was divided by the diameter of the stop. One should take the diameter of the cone of rays which enters the stop, as measured on the front of the combination, supposing the lens to be a doublet, otherwise the intensity is not properly obtained. The thing that should have been settled was the definition of "aperture."

Some discussion ensued regarding the use of the "magnifiers" and their title to their descriptive name; as also upon the new "Unar" lens, which Mr. Everitt claimed to be a modified Planar, while others saw in it a close resemblance to a well-known lens of English make and design. The diagrams of the lenses were compared and the essential points of difference discussed at length.

PHOTOGRAPHIC CLUB.

MAY 30.—Mr. Charles Wallis in the chair.

Mr. E. W. FOXLEE, alluding to the short discussion the previous week, on papers for photographic purposes, said that the Rives and Steinbach firms were the two which had practically a monopoly in this industry. He said that they made also a thick cheap paper for printing-out papers which was selling at $8\frac{1}{2}$ d. per lb., and it occurred to him that, as almost all of the P.O.P. papers were surfaced papers, one was rendered tolerably independent of the paper itself. As, therefore, it mattered less in this case whether our paper were of that purity required for other sensitive papers, it would, perhaps, be feasible for some English house to procure a fairly decent paper, coat it, and supply it to home users. A few years ago he experimented with papers for a collodio-chloride paper, having samples from the houses previously mentioned, and others who made a feature of baryta-coated papers. Some of the samples changed colour in a fortnight or three weeks, while others were good after as many months. Curiously, the best paper tried was of a very common make indeed. It was prepared in Germany for collotype printing; but, unfortunately, the foundation was so common that it would not stand water. By the time a print was fixed it could barely be handled; otherwise, the coating was well suited for the reception of the emulsion. It would seem, then, that a tolerably tough, cheap paper, suitably coated, should answer well for emulsion papers. We heard a good deal of fading of gelatine prints, but it was very probable that the cause was to be sought in the coating material with which the free silver combined. In reply to a question, he said that a pure paper was not so necessary for the platinotype process.

Mr. R. R. BEARD gave some particulars of a method employed by a friend in order to produce a pressure of gas of about eight or nine inches. A foot pump, with about an inch and a half stroke, was used to raise a column of water to a height, giving a pressure above that at which a regulator used would deliver the gas. The best pressure for the ordinary Bray burner was nine-tenths of an inch. He believed the device he alluded to had succeeded very well.

Croydon Camera Club.—In these days of pocket hand cameras, it is surprising that so few amateurs have provided themselves with apparatus available for the fascinating practice of enlarging, for, given a good negative and a clever worker, a surprisingly sharp picture of huge magnification is possible. Just to show how everything has been made easy, Mr. J. E. Lockyer, the well-known photographic chemist, of Deptford, exhibited and described the use of his enlarging, reducing, and copying apparatus at the club-room on Wednesday, 30th ult. In this, what is often the bugbear of the amateur, viz., the accurate focussing of a negative image preparatory to making an enlargement, is done away with by the simple expedient of providing a series of grooves into which lens-carrier and dark slide respectively are placed, according to the size of enlargement required, which may thus be produced, having the sharpest possibilities of definition. The apparatus will make enlargements, enlarged negatives, lantern slides by reduction, and may be used for copying

or for direct photography from nature. It evoked much interest and approval; and, in the course of proposing the thanks of the Club, the President said, not only should they, but all other amateurs, feel under obligation to Mr. Lockyer for placing this admirably designed apparatus at their disposal. Amongst interesting photographs shown by members were the following: A set of twelve platinotypes by Mr. Hector Maclean, being graphic studies illustrating the making of railway trains in the Brighton works. These have been prepared for the S.E.U. Science Congress Exhibition, which opened at the Brighton Pavilion on June 7. Mr. Stanley showed eclipse photographs, as did Mr. Ben. E. Edwards, who obtained some useful information respecting the suitability of various emulsions for eclipse photography. Finally, Mr. W. H. Rogers showed some charming little studies done upon Mr. Otto Schötz's siennatype paper. They had been toned with a borax bath to a sepia tint. With the advent of June, the regular evening lectures, &c., are discontinued in favour of photographic outings. Of these, ten have already been arranged for, most interest centering round a whole-day excursion which the President is organizing to Dickens' land. This will include Rochester, with its "Pickwickian" scenes, and others connected with "Joe Gargery," and "Pip," "The Seven Poor Travellers," &c. The Leather Bottle at Cobham, which is threatened with early destruction, will also be visited. Finally, the great man's last home, Gad's Hill, will be inspected. Should time permit, Lord Darnley's grand old palace at Cobham will also be photographed. Brakes will be provided at small fees, and everything done to ensure that only the right places are visited, to which end the Rev. C. H. Fielding, of Malling, has kindly undertaken to make all local arrangements, and act as the party's guide, philosopher, and friend. Members desiring to take part in this memorable excursion should at once register their names with Mr. Maclean, 34, Birdhurst-road, Croydon.

Hackney Photographic Society.—On the 29th ult., Mr. W. FENTON-JONES read a paper on

DEVELOPERS,

and gave the results of his experiments with the principal developers. The conclusion arrived at was that the different developing agents varied very little from one another as regards their developing powers, but they differed in the time required to produce their maximum effect.

FORTHCOMING EXHIBITIONS.

1900.

- July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.
 August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
 October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
 November 12-17 Ashton-under-Lyne.
 " 21-23 Hackney Photographic Society.

1901.

January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

PHOTOGRAPHING AT THE PARIS EXHIBITION.

To the Editors.

GENTLEMEN.—Last week I had the pleasure of giving you an address at a hotel where a suitable dark room is fitted up. Now I have some further information that may interest photographers at the Exhibition. It appears that all the officials are not aware of the rules. A couple of days ago I placed my camera down on a settee with the knowledge and in sight of two officials when another made his appearance demanding to see my permit, which I had not got, believing that as I had no tripod, it was unnecessary, the result of this was that I was marched between two policemen the full length of the Exhibition grounds to the Bureau de Police, where I was introduced to a very polite gentleman who spoke pretty good English; he took my name, age, colour of hair, complexion, and full address in England and in Paris. Asking where my feet were, meaning the tripod, I replied that I was not in the habit of detaching them, but my camera legs were at my hotel. By pure luck I had the card in my pocket of a gentleman in a very high position in the French police, my passport was at the hotel; this, coupled with the statement that I had not had lunch, and "a hungry man was an angry man," and if I was not soon liberated I would get angry, I was told that I could depart, and with a mild apology was informed it was not the fault of the two first policemen.

Mr. York has been stopped on several occasions, but, as he carries about the regulations in French regarding photographing, he has fared better than yours truly,

A. L. HENDERSON.

P.S.—I would advise all photographers visiting the Exhibition to carry the printed regulations. There is one very great hardship, viz., one has to pay twenty-five francs if he uses a stand for five hours' work, viz., from eight to one, and should the subject require an afternoon light he is powerless, and, as he has to get his permit the day previous, he has to run the risk of a wet or unsuitable day.

SALES BY PUBLISHERS OF PHOTO-BLOCKS, &c.

To the Editors.

GENTLEMEN.—The subject mentioned in "J. P.'s" letter this week, on p. 351, is one that has interested and puzzled me greatly, and I, like him and many others, would be glad if some of your legal readers would settle the question.

Last year I wrote a book on my travels, and, in addition to my own photographic illustrations, I bought about twenty blocks from six different weekly and monthly magazines, each of which, in reply to a special letter of inquiry, told me it was unnecessary to ask permission of the photographer who took the views; some of the editors, by the way, said it would be as well to acknowledge their origin.—I am, yours, &c., R. P.

Cambridge, June 2, 1900.

LANTERN SLIDES FOR THE CONVENTION.

To the Editors.

GENTLEMEN.—The usual lantern display at the Photographic Convention at Newcastle-on-Tyne is this year under my management, and I am anxious to make it a really good one. I want to get a few really good slides from all our best workers, and therefore ask their kind assistance.

A few good slides, reaching me not later than June 10, will be much appreciated, and I'll do my best to give due credit to the gentlemen so obliging me. I do not want hundreds, but yearn for half-dozens of prime quality.—I am, yours, &c.,

WALTER D. WELFORD.

Warwick Lodge, 166, Romford-road, London, E., June 2, 1900.

Answers to Correspondents.

* * * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

- A. H. De'Ath, 32, Bank-street, Ashford, Kent.—Two photographs of Mrs. Moon.
- E. E. Smerdon, 14, High-street, Newport, Isle of Wight.—Photograph of declaration of poll.
- J. McNamara, 39, South-street, Romford, Essex.—Photograph of The Ford, Havering Well.
- R. Ayton, 43, Bruntsfield-place, Edinburgh.—Photograph of English Foo-ball Team v. Scotch. Photograph of Scotch Team v. England.

J. KENNERELL.—We are much obliged by your letter.

TOBACCO SMOKE IN DARK ROOM.—J. ABBY. We suspect you must look for other sources of fog in the negatives than the presence of tobacco smoke in the dark room. That, you may rest assured, is not the cause of the fog, but what it is we cannot say.

COLIN TUCKER (Aldershot).—If the lens is one of Messrs. Dallmeyer's, we should advise you to take it to them; if it is one of the nameless variety, then, perhaps, Messrs. Sands & Hunter, of Cranbourn-street, Leicester-square, W.C., would undertake the work.

RESIDUES.—AMATEUR. As your expenditure for photographic material—plates and paper—is, annually, so small, we should say that it would not be worth your while to save the wastes, that is if time is of any value. The return would be so small—probably not more than three or four shillings a year—after the cost of reducing has been deducted.

STEREOSCOPIC CAMERA.—N. MASSEY. In reply to your inquiry we should say decidedly that the camera should be provided with the means of separating the lenses as may be required for the subject to be taken. It is also desirable that it should have a rising and falling front so as to regulate the foreground, which is an important item in stereoscopic pictures.

DURATION OF COPYRIGHT.—T. CARTWRIGHT writes: "I have a negative that, in the future, is likely to become very valuable. It was taken nearly three years ago, and made copyright at the time. How often should it be re-registered to keep the copyright alive?"—No re-registration is required. The copyright lasts during your lifetime and for seven years after your death.

FAULTY C.C. PAPER.—J. C. B. says: "Can you suggest the cause of the uneven tones on the enclosed C.C. prints? With this lot of paper I can get nothing else. I enclose two or three pieces of it unprinted."—The cause is that the paper is not evenly coated with the emulsion. This will be seen if a piece of it is exposed for a short time to light. As the collodion film is uneven, even tones cannot be expected.

ASCERTAINING COPYRIGHT.—W. & CO. write: "We have had brought to us to copy a dozen photographs. They are views of different watering places and we have a suspicion that some of them might be copyright, though they are not so marked. The man who bought them said they were not. How can we learn for certain?"—Only by searching the file at Stationers' Hall, unless, indeed, you apply to the photographers who took the pictures.

COLLODIO-CHLORIDE PRINTS.—NORFOLK says: "Will you please tell me, an amateur, if collodio-chloride prints can be blotted off and dried quickly, like albumen paper? I am now using P.O.P., and am much troubled by dust sticking to the pictures while drying, and I am so situated that I cannot avoid the dust in the room."—Yes, collodio-chloride prints can be blotted off and dried before the fire if desired; the prints will not be injured by this procedure.

PATENT SPECIFICATION.—W. DAVY says: "I want the specification of a patent that was taken out some few years ago, but I live, as you see, far in the country, and cannot go to the Patent Office for it. How can I obtain it?"—At your Post Office you can obtain a form—Patents Form C I—for 8d. Fill that up and post to the Patent Office, and you will receive the specification in due course. You will have to give the number of the patent and the year that it was taken out.

FIXING.—ARISTO writes: "I have just been trying some American aristoplano paper, the fixing bath says 18 grains to the ounce of solution; would you consider this sufficient to fix, say, eighteen pieces half-plate size? If I use 6 drachms hypo to the 20 ounces of water, it seems a small quantity. I should fix fifteen minutes."—We should say that there is some misprint in the formula; 18 grains to the ounce is considerably less than an ounce to the pint of water, which is far too weak for a fixing bath with fifteen minutes' immersion.

BURNISHING PRINTS.—U. H. J. writes: "I am desirous of getting a high polish on my cabinets. The best result I get is with spermaceti wax and benzole rubbed on glass and the prints squeezed on and stripped off that. Sometimes they stick, and it takes a long time when I get a lot of cabinets. Can you tell me the best roller or burnisher or an easier method of getting a good burnisher?"—There are so many good burnishers on the market, supplied by the different dealers, and there is very little to choose between them so far as results are concerned. All are good."—It is quite opposed to our rules to recommend any particular manufacturer's goods. Better get prospectuses from the various dealers.

STEREOSCOPIC LENSES.—W. H. B. writes: "I have bought, second-hand, a pair, or what are supposed to be a pair, of stereoscopic lenses, but I find that their foci are not quite identical, there is nearly the thirty-second of an inch difference between them with their full opening; but the difference is not noticeable when they are stopped down to f.16. Can the lenses be used successfully for stereoscopic work?"—It is always desirable that the lenses should be of identical foci; but when the variation is so trifling, as in this case, it will, practically, make no difference if each is adjusted to its focus. A piece of cardboard, of the right thickness, under the flange of the longest-focus one, is all that will be necessary.

SQUEEGEEING GELATINO-CHLORIDE PRINTS.—PHOTOGRAPHIC CHEMIST writes: "Will you oblige by saying the best means to adopt in squeegeeing P.O.P. prints on to plate glass, so as to obviate their adhering to the glass? Have tried various means, but none are perfect. What I find to answer best is to clean the glass perfectly with Monkey-brand soap, and then polish with a solution of spermaceti dissolved in benzine, but even this allows of marks on finished article."—All the well-known published methods answer well if they are carefully carried out—the glass well cleaned, &c. The marks, in the case of the method our correspondent finds best, are due to the spermaceti coating not being evenly polished off. The remedy is obvious.

SUN'S ECLIPSE.—A. J. writes: "Being curious to know what results could be obtained by photographing the eclipse with ordinary apparatus and plates, I constructed a box sort of contrivance to my camera, to make extension enough to take the back combination of my half-plate R.R., which gave me a lens of about fourteen inches focus. I made four exposures, and was surprised on development that I received what I should presume to be a positive, instead of a negative; I gave a quick hand exposure in either case, and would suppose that my exposures were much too long, and hence the reversal. I have no practical knowledge, and know little of the theory of eclipse work. Is my surmise correct in the matter?"—Yes. Clearly reversal due to overmuch over-exposure.

THE CARRIAGE OF NEGATIVES.—G. PARK writes: "A short time back I sent several negatives through the parcel post to a trade retoucher. On the return of same, I found three had been broken through bad packing in coming through the post. Will you kindly inform me whether I can claim compensation from the retoucher? I have written him asking for compensation, but he replies he is not responsible for damage done in transit, and that claims for damages must be made on the Post Office. I should add, the retoucher has no notice printed on his bill heads, price-lists, &c., that he is not responsible for any breakages or damage done to negatives. The retoucher also states that the negatives were very carefully packed before posting."—It is a universal custom of the trade that the senders are not responsible for damage during transit, so that the claim should be made against the carriers, whether the Post Office or others. The parcel should have been opened when delivered, and if any damage seen, its receipt should be declined at the time. Then the matter would rest between the carriers and the sender as to damages.

* * * A number of Answers to Correspondents, Reviews, Notices of Apparatus, and other communications, are unavoidably held over.

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EX CATHEDRĀ.

KEW Gardens, beloved alike of the botanical student and the holiday-maker, also offers peculiar attractions to the photographer, who finds wide scope for making negatives in the numerous plant houses and gardens that form the main features of the celebrated botanic institution founded about 41 years ago by the widow of a former Prince of Wales. One of the latest to undertake anything like a systematic photographic study of the Gardens is Mr. E. J. Wallis, a member of the Royal Photographic Society, who has just issued a book entitled *The Royal Gardens, Kew, Illustrated*. Mr. Effingham Wilson publishes the volume, which is also obtainable, we understand, at the Gardens. Mr. Wallis includes in his book thirty selected photographs of about whole-plate size, reproduced in half-tone, separately printed, and accompanied in each case by explanatory notes by Sir W. T. Thiselton-Dyer, the Director, who, in the course of a brief preface, pays a tribute to the skill with which Mr. Wallis has photographed the most interesting and striking features of the establishment. The

book all through is distinguished by care and beauty of production. Mr. Wallis perhaps shows his best photographic work in the views taken of the Palm, Lily, and Temperate houses. The volume gives one a very good idea of the chief aspects of the Royal Gardens, and it should find its way into the possession of many visitors.

* * *

ANIMATED photography is about to reach its inevitable, if not its ultimate, development. The Biograph Company will shortly open a studio in Regent-street for the purpose of exploiting animated portraiture. Amidst surroundings which the arts of the decorator, the upholsterer, and furniture-maker will render luxurious, people will move about in a light of 100,000 candle power (more or less), while a sensitive film passes rapidly behind the lens, and an impression of all the various phases of motion is secured. The possibilities of this interesting departure are, of course, very great, and, if Society (with a capital S) gives its patronage to the idea, animated photography in the Biograph studio will be assured of considerable success. The skill and resources at the disposal of the Biograph Company are so great, that we may be sure of this branch of photography being made to yield the best possible results for the delectation of those who are attracted to it. We have heard that Mr. Harold Baker is to have charge of the studio, which will therefore be under very competent direction. It will be an interesting experiment, and it is probably destined to excite much attention, although we do not share the sanguine opinion of a daily journalist that, in consequence of this departure, "the old-fashioned 'still-life' photography is to give way to the photographic living picture." Let not any of our readers be induced by such foolish writing to consider for an instant the desirability of converting their ordinary studios into brilliantly illuminated rooms, where thirty or forty exposures a second may be made on a band of sensitised celluloid. The demand for photography of this kind is not likely to be great, as its expensiveness obviously restricts it to a comparatively narrow circle. Still, this does not lessen our interest in the Biograph Company's experiment, which we hope will turn out successful.

WE have to acknowledge receipt of a copy of a recent issue of the *Effingham Democrat*, which is published at Effingham, Illinois, U.S.A. A large part of the issue is given over to a description of the Illinois College of Photography, and the exterior and interior of that structure are illustrated by five half-tone illustrations from photographs. We described the College at length in the JOURNAL a few weeks ago ; it appears to be an institution where non-resident pupils may, for moderate fees, pass through a course of instruction in practical work, which, to judge by a study of the syllabus, might qualify them to take up portrait photography as a profession, provided they were proficient. Of Mr. Bissell, the founder of the College, the *Democrat* writes in the following manner : "Mr. Bissell deserves to be mentioned with Mergenthaler, the type-setting machine man, the type-writer inventor, and with the creators and discoverers of the numerous other inventions, for his College is as much of a creation, of an invention, as are the others. Six years ago the College of Photography started up with one instructor, a short curriculum, and the very humble quarters of a common photograph gallery. The course of study was thorough and covered the ground, but with its humble building and appurtenances nerve was the chief asset. Mr. Bissell possessed it, and, meeting difficulties, criticisms, and mutinies, and overcoming them, he marched steadily forward. Very soon what his friends thought was a dream, an hallucination, began to take shape as an active, tangible, living reality. The students increased, the College quarters grew, scientific papers began to notice it, its advertisements appeared in the leading and most expensive advertising mediums in the country, and in the course of a very few years the Illinois College of Photography was a marked educational and financial success. This is the achievement of President L. H. Bissell. We are proud of him and of his institution." Upon this exquisite specimen of high falutin' we need only pass the remark, the paraphrase of an utterance attributed to Abraham Lincoln, that "for those who like this sort of thing this is the sort of thing they like." Mr. Bissell teaches the ordinary stock subjects likely to advantage would-be operators, retouchers, printers, &c., and we wish him success in his enterprise. Here, in London, which perhaps is equal in size and importance to Effingham, Illinois, Mr. Howard Farmer for these many years past has been teaching almost every branch of photography at the Regent-street Polytechnic, and, such is man's ingratitude, nobody appears to have thought of bracketing him with Mergenthaler and "other creators and discoverers!"

* * *

A COLLECTION of photographers' note and bill headings, we often think, would give material for astonishment, not unmixed with amusement, at the very great number of ways in which a photographer is able to describe himself. In most cases the unqualified designation, pure and simple, seems to satisfy the wants of those who feel it necessary to signify on their stationery the nature of their business or profession—they are content to call themselves photographers, nothing more, nothing less ; but among the large minority there are many variations of the term, which, however striking or impressive they look, really carry no more significance. Thus there are photographic artists, artist-photographers, photographer-artists, pictorial photographers, art-photographers, high-art photographers, and so forth. It is just as curious to note the legendary references to the subdivisions of a business which are sometimes seen on note headings and memorandum forms. For example, "the

new instantaneous process" is still very often listed as speciality—a claim that surely presents a belated appearance in the year 1900. And then that rare and consoling old "stability"—"photographs by the new permanent process!" With what tenacity it keeps its place amongst the literature photographic stationery ! It even appears in the following note-heading schedule which we quote for the purpose of complimenting the correspondent, from whose letter we cut it, his enterprising readiness to do "anything to oblige," Captain Dudley Smooth, in *Money*, phrases it : "Appointments made for any hour, distance no object. Applications & estimates will be considered a favour. Studio open from 8 a.m. to 8 p.m., for day and artificial light photography. Photography in all styles and of all descriptions. Artistic results each person studied for. Characteristic positions. Children photos a speciality. Photographs in platinotype highly recommended for artistic and permanent results. Copying from photographs, no matter how small or faded, and enlarged life size. Work finished in the new permanent process. Cricket, wedding, family, or other groups taken in or out studio. Animals specially studied." The photographer who can accomplish all this satisfactorily to his sitters and clients reduces the question of success to a certainty.

* * *

A FURTHER contribution to the study of the natural-colour photography problem has been made by M. Graby, who, appears, has recently repeated some experiments on paper containing subchloride of silver and bichromate of potassium. Finding that in some cases prints were obtained which gave a appearance of the natural colours (*sic*), he came to the conclusion that, since this effect is obtained by the violet-blue of the subchloride and the orange of the bichromate, the next step would be to make a separate print of the blues and violets upon a blue paper, and one of the oranges and reds upon an orange paper, and that these prints, when superposed, would give, more or less, the desired effect. "His method of working is to make the first exposure upon a plate sensitive to orange, behind a red screen ; the second exposure is made with a screen of bluish-green upon a plate sensitive to the blues and greens. By using a stereoscopic camera the two exposures may be made at the same time, besides obtaining relief."

* * *

THE account from which we are quoting proceeds to inform us that in M. Graby's experiments the first plate is printed upon the ordinary ferro-prussiate, or blue print paper, the second upon a chloride of silver paper, which is not toned, but merely fixed in the hypo bath and washed, giving thus an orange-brown colour. The two prints are pasted upon a stereoscope card, and viewed through a stereoscope, a red screen being placed before the blue print, and a blue screen before the orange. In this case the colours of the object are seen with a greater or less approximation, and, if a stereoscopic camera has been used at first, relief is also given. A remarkable point observed, we are told, is the brilliancy with which the metals are reproduced ; thus, in the case of gilding, the colour is not merely yellow, but a fine metallic lustre is given. This process is claimed to be one of great simplicity, as it requires but two exposures and two prints, which are made without toning. By making one of the prints transparent, the colours may be obtained by superposing one on the other.

e further learn that the process is now in an experimental stage, and is capable of further improvement to obtain a close approximation to the natural colours; it has the disadvantage of not reproducing the reds or violets to any great extent, but, there are many subjects which do not contain these colours, the process may be used to advantage in certain cases. It is unfortunate that a properly authenticated record of M. Graby's experiments and the theories upon which they are based was not published instead of the above necessarily condensed translation. But, on the assumption that the account does not represent him, we cannot hope that, by his combination of chromatic negative work, and a somewhat hap-hazard (or what appears to us such) system of printing, M. Graby is likely to add materially to our knowledge of the natural-colour problem. In parts his work appears to be purely empirical—e allude to the printing method. However, the experiments are interesting and curious.

NEW APPARATUS.

ENGLISH-BUILT cameras enjoy a reputation the whole world through for the highest excellence and easy superiority over every rival, and, such being the case, it might be thought that, piece of new apparatus once purchased, there was nothing to do but to shoulder the tripod or strap up and carry the outfit and set to work; but, as we will show, there are several points to consider before this can be done, and to start serious work with a new outfit without first overhauling it would be a mistake. In the first place, it must be remembered that it is not every one who cares to go to the expense involved in the purchase of instruments of the very highest class; indeed, we should imagine that, for one such outfit sold, there must be a hundred of the less costly kind—hand, stand, or magazine type.

In the course of a lengthened experience with cameras of many kinds, we have rarely met with one which—and more specially in the larger sizes—was not beyond improvement at our own hands, with an expenditure of labour rather than skill. A well-made camera is a beautiful example of the cabinet-maker's art, but a practical photographer wants something more, and especially in the case of his dark slides, for example. A set of slides are examined; the shutter, we will say, draws out and returns without a hitch, and is sufficiently tight to ensure complete light-tightness; but let the slides be used on what is termed a "muggy" day—a day with the atmosphere laden with damp, and investing every exposed cold surface with a thin, invisible film of moisture—and let them then be put away for a week or month or two. What will be the result? In nineteen cases out of twenty the shutters will either stick altogether or jam so tightly that the focus will be displaced in the exertion of drawing the slide. Possibly the camera-maker would say, "My cabinet work represents a valuable scientific instrument, and should be taken care of as such—kept dry and free from these drawbacks," &c. But that is not the way to look at the matter. A camera is liable to be exposed to various atmospheric influences, neither day nor climate being invariably at the pick and choice of the user, and we do not hesitate to assert that a slide shutter may, and, indeed, ought to, work very loosely and still be light-tight. Hence our advice is, that every dark slide should be examined in this

direction, and, if, as will most probably be the case, the shutter should work a little stiff, it should be entirely removed, and very carefully rubbed with fine glass-paper in the tighter parts, and well wiped before being replaced. A little powdered talc should also be applied to increase the smoothness of working. With regard to the camera itself, there is less to be said; but, as, when the season is in full swing, it frequently happens that orders are in advance of possible turn-out, the press of work may lead to some trivial detail being defective—something that a workman could put right in a few minutes—it is better not to assume that everything is right, but to set the camera and tripod up, examine it well, and see that it will shut up properly. We remember a case where a man had bought a new camera, and taken it out untried, and, when he had exposed his plates and began to "unlimber," he found he could not shut his camera up except by main force, which, when applied to a good camera, generally spells disaster.

We now come to the most important aspect of our subject, which will be best dealt with by narrating a true experience. We were asked to diagnose the cause of fog on a dozen plates exposed under identical conditions. The dozen were a large batch, and all others used from the same stock, both before and after this defective packet, were in every respect perfect. The natural assumption was light fog. We examined the camera, a new one by a first-class maker, and of the magazine type, but we failed to discover a defect. We noticed, however, that the sheaths still retained a varnish-like smell, and we found that the plates had been put in the camera, exposed, and developed within twelve hours of the receipt of the instrument direct from the actual maker. Previous experience suggesting a possible cause for the disaster, we inserted a couple of plates in the camera, left it for twenty-four hours in the dark room, and then, without exposure, placed the plates in the developer with two fresh plates out of the same box. In a short time the plates from the camera were wholly fogged, while those direct from the box showed clear glass. The explanation was obvious. The liquid constituent of the black varnish, which had not entirely volatilised, gave off a portion of that residuum in the form of a vapour, which, in a manner explained before in these pages, very quickly brought about some change in the film that was developable into a strong "fog." We may at once say that such conditions have, in our personal experience, been brought about in many ways, but all traceable to emanations from the slide, the camera, or other surfaces. We have, as before mentioned by us, seen a lot of negatives spoiled simply by the cloth used for hinging the sections of the slide shutter. Only a fortnight ago we met with another instance.

The manager of one of the largest firms in the country showed us two negatives with two bands of, apparently, insensitiveness in the film, which had not developed at all. He informed us that they were caused by this hinging cloth in a slide that had been repaired three months before use. The plates were put in one morning, exposed, and developed before the day was over, and the results were as described.

We are aware that some makers advertise that their slides are hinged with a cloth that does not attack the plate, yet we consider that, as a matter of common prudence, no camera should be taken on trust as to this point. And, in conclusion we would say that with all new cameras, in addition to the recommendations already given, it is most desirable, we would go further, and say that essential to safety they should be set up with the focussing screen removed or thrown back; the

camera fully extended ; the dark slides thrown open with shutters drawn ; inner frames, if any, reared up on edge in some convenient place, and all left exposed to the air in a well-ventilated room for as long a time as can conveniently be given. There will then be every reason to expect a complete freedom from drawbacks in the newest of apparatus.

Focussing and Focussing Eyepieces.—There are at the present time, and have been for decades past, various focussing eyepieces to magnify the image as seen on the ground glass, all of which answer the purpose well, though they are not always used under their best conditions. The best of them is the old form, the "Ramsden eyepiece." This consists of two plano-convex lenses, mounted at a suitable distance apart, with their plane surfaces outward, the tube in which they are mounted being furnished with a screw and set nut to fix it when adjusted to the focus of the eyes of the user. Unless that is accurately done, the instrument loses the greater part of its value, and may become even misleading. This fact does not appear to be completely understood by every one. We will here quote an instance that recently came under our notice, and we might give others. Calling on an old portraitist the other day, he, in conversation, complained that his sight was failing him through age, and that he could not see to focus sharply even with his spectacles on. We suggested a Ramsden eyepiece, but he replied that he had used one for over twenty years, but, although he could at one time see well with it, and always used it, now it was of no use to him ; in fact, he could do best without it. We asked to see the instrument, and found that it was set, as it probably was when first purchased, for a person of normal eyesight. We then made a small mark on the ground glass of the camera, and asked him to examine it with the eyepiece some little distance away, moving it backward and forward until he could see it clearly defined. This he could do distinctly when it was a full half-inch from its surface. Then we, after some difficulty, on account of corrosion, released the clamping screw, and set the tube some distance further back. A second trial showed that it was still too near. Finally it was got right for his sight, when he could focus with it as well as he said he could do twenty years ago. We mention this case to illustrate that, although focussing eyepieces may be used, they are not always used under the best conditions. Although our friend had found it necessary to from time to time change his spectacles through the focus of his eyes getting longer with age, it did not occur to him to lengthen the focus of his Ramsden eyepiece.

Actinism of June Light.—The number of letters we have received, accompanied by faulty negatives, clearly illustrates that it is possible for many amateur photographers to have "too much of a good thing." The trouble of those who have written and sent examples has been nothing more than very much over-exposure, and nothing else. The workers have not sufficiently taken into consideration the present improved quality of the light, actinically. Those who took up photography for the first time last autumn, for example, do not seem to realise the wide difference there is between the actinic quality of an autumn and a spring light, hence their failures. We notice that one firm of plate-makers—the Ilford—in their advertisement, say, "During the summer months don't use special rapid plates, or you will run the risk of getting over-exposed negatives." Amateurs, as a rule, particularly novices, seem to think that the fastest plates procurable and the most rapid shutter are essentials to success, more particularly with hand cameras ; this is a great mistake. We have little hesitation in saying that the largest consumers of extra-rapid plates, during the summer months, are amateurs. Professionals and the more initiated avoid them, and prefer a slower plate, as giving better results and requiring less skill in their manipulation. When very rapid plates are used during the spring and summer months, a very rapid shutter becomes imperative to avoid over-exposure, whereas a slower-acting one would yield a better and more realistic picture. Again, for the same reason a

small stop in the lens must be employed. Where, then, are the advantages of employing the ultra-rapid p'ates, when all the ext precautions entailed in their working are considered ? There are no—just the reverse. Some amateurs are under the impression th the smaller the stop employed in the lens the better will be the result, hence one of their reasons for using extra-rapid plates. Tha as a rule, also is a mistake, though it is true that some of the cheap forms of lenses will not give good definition without one. Th remark, however, does not apply to good instruments, they wi cover the plates they are intended for with a wide opening, f-11 or larger, for example. Incurring all these unnecessary extra difficulties to use the extra-rapid plates, when the same end may be better attained by the use of slower ones, seems very like employing complicated steam engine to draw a cork, while a simple corkscrew would answer the purpose better.

The New Physical Laboratory.—The site selected for the National Physical Laboratory, in the Old Deer Park, evident does not meet with the approval of some of the good people of Richmond. At the opening luncheon of the Richmond Horse Show on Friday last, the Mayor, in referring to the contemplated erection of this institution, is reported to have said that the company present were aware that it was proposed to erect the new buildings in what would be a very incongruous position, and interfering with the prospect over the park, adding that the Laboratory would be a useful institution, and they would be glad to see it in Richmond but some other site should be found for it. It may be fairly supposed that the Mayor, at the Horse Show luncheon, was echoing the opinion of Richmond, though most towns, we should have supposed, would have felt highly honoured by having a national scientific establishment of this character in its neighbourhood; particularly considering that the grounds, upon a small part of which the building is to be erected, were but recently handed over to it as a public recreation ground. In the selection of a spot for a National Standardising Laboratory surrounding conditions are naturally an important factor in the case, and, doubtless, that is why the spot chosen was selected by the authorities. After all, the National Laboratory is not an unsightly factory, with tall chimneys emitting offensive vapours, and bringing together large numbers of workmen, always an objection in residential neighbourhoods, but a building strictly for scientific purposes, and to be worked by scientific people. Though adjacent to the Kew Observatory, it is necessary that it should be some distance away from it, so that the various operations carried on in the two buildings should not interfere with each other. This might be the case, say, in some delicate magnetic and many other observations if they were closer together. However, it is possible that the Mayor, on the occasion referred to, did not echo the voice of the majority of the people of Richmond, which includes many scientific people, who are well aware of the absolute necessity for a suitable spot for such a national institution as this is to be. No doubt they feel more honoured than otherwise that the one chosen in the old Deer Park has been selected, even if it be not quite to the taste of some. They may also think that a Horse Show luncheon is not the most suitable place to refer to such matters as the position for a National Physical Laboratory.

WITH THE ECLIPSE EXPEDITION TO AMERICA.

THIS is the land of true progress. Things "move right along" here, as in no other country. Having had experience of this, I can speak with confidence. Probabilities point that way, at any rate. Surely, in no other country would it be possible that a law could be entirely altered, in the interval between the last thing on Saturday night and the first thing on Monday morning. And this without any effort on the part of the Legislature. But, in New York, I have seen that miracle performed.

With the British astronomical expedition on board, the good ship *Minneapolis* arrived at New York, a week ago yesterday. By the courtesy of the American Government, our instruments were to be admitted free of duty ; and we had reams of documentary evidence

that effect, stamped, signed, sealed, and delivered. But, when our cases were brought up for review, the trouble began. The Custom officials were models of courtesy, and appeared disposed to give us every facility in their power. It appeared, however, that, although we had the courtesy of the port, the law demanded that our goods must be opened and examined, just as though they were ordinary merchandise. It was a deadlock. The officials were bound to do their duty; and we felt that, under the circumstances, we would see them something more than further before we would allow a single screw to be loosened. We spent a delightful five hours in trying to discover a *modus vivendi*, and left eventually, with all our goods and chattels marked "Hold." After leaving the docks, I wrote to an American friend, stating our dilemma. On Monday, I heard from him that he could "find no clause in the law that will allow them (the instruments) to be passed by the Custom House officers, unless you are entering as emigrants, and bringing your tools as instruments of your trade or profession."

According to appointment, I returned to the dock early on Monday morning, in order to continue the altercation; whilst Mr. Bacon went or help to the Consul General. Arriving at Pier 39, I met a courteous official, who said, "Come this way, please." We went upstairs to the place where our baggage was held in bond, and, without a murmur, every package was then and there chalked and passed out. What could have happened to the laws of the United States during the Sunday, I cannot say. I can only record the facts.

My missing case of instruments, I hear, was never put upon the vessel; so I have to do without them. The result is a makeshift, composed of anything that could be obtained by scouring New York, and put together here, with the aid of the local carpenter. Nevertheless, I hope to be able to expose a cinematographic film during the eclipse, and thus secure the longest series of photographs ever taken of such a phenomenon. All the rest of my projected work must be left for some future occasion.

Arriving here on Wednesday last, we found a welcome awaiting us such as we could never have anticipated. It is impossible to conceive anything more pleasant than our present surroundings. Of the warm-hearted hospitality displayed by the leading citizens of Wadesboro we shall carry with us a tender recollection to the end of our days. We are overwhelmed with kindness and sincere friendliness on every hand. From this hotel to our camping ground the distance is less than half a mile, but we are not allowed to walk to and fro. Carriages are always waiting to convey us wherever we may wish to go, and we do not even know whom to thank. All we can gather is that the carriages are ours, to use as we please. And that is only one instance of the extreme liberality of our good friends in this neighbourhood.

Turning to our fellow-visitors, we find every reason for self-congratulation. No man could wish for more genial or more intellectual society. Almost on the moment of our arrival, we were visited by Professor Young of Princeton University, who invited us to establish ourselves in his camp. Needless to say, that invitation was accepted with something more than alacrity. Proceeding to the camp, we found it situated upon the brow of a hill, overlooking a rolling, wooded plain, stretching for miles. The view, indeed, is superb, and the site chosen leaves nothing to be desired. At the camp there is yet another instance of the extreme courtesy and kindness universally displayed towards us. Side by side with the flags of the United States and Princeton University there flies the Union Jack! We learn that the Princeton party positively scoured the neighbourhood to find a British flag, and were vastly disappointed to find that it had not arrived before us. However, when we went to the camp on the second morning, there it was, floating gaily beside the others.

A few hundred yards from our camp is the station occupied by parties from the Smithsonian Institution, under Professor S. P. Langley, and from the Yerkes Observatory, under Professors Hale and Barnard. There is only one word which will describe the equipment of this camp. It is magnificent. Taking the two camps together, it may be safely said that there has never been gathered together in any spot so large and elaborate a collection of instruments for observing an eclipse. And never has such a number of cameras

been brought together upon any occasion, except, perhaps, in an exhibition of photographic appliances.

And there are many interesting things to photograph, apart from the eclipse. If I only had my cameras here, I could send home any number of subjects, both instructive and amusing. For instance, the spectacle of a party of distinguished astronomers chasing a cow would be distinctly classic. It appears that, on the ground occupied by the Smithsonian and Yerkes parties, there is a cow which was reared upon a farm some miles distant. One condition of the ground lease is that this cow shall not be allowed to escape. And the one aim in life of the cow seems to be to return to the place of its birth. Periodically, the cow contrives to get out of bounds; and, on such occasions, the entire staff turns out to "purwail upon" the animal to stop. So far the astronomers' efforts have been successful, and the terms of the lease have been faithfully observed. Again, the spectacle of a party of distinguished astronomers playing leap-frog, and "doing stunts" of various kinds, would be eminently soothing. As I have reason to know, but this, perhaps, should only be whispered with bated breath.

It would be interesting to know how many exposures have been made here by members of the various parties, to say nothing of the professional photographers with whom one collides at every turning. Certainly I have been photographed here more often than in all my previous existence. "Just a moment, please!" we hear every few minutes. Then there is a little snap, followed by "Thank you," and yet another group is added to the total. Naturally, those interested in the eclipse are always conversing more or less in groups, and the resulting permutations and combinations afford unlimited opportunities tempting to the snappers. As for Professor Young, his life here must be absolutely a burden to him. Everybody loves him, and I believe he is the most photographed man in the universe at the present moment. A most amusing scene occurred yesterday whilst the genial professor was taking the local time. In the centre of the camp he sat, sextant in hand, and surrounded, apparently, by some hundreds of cameras, whose "business ends" were all directed towards him, with a view to taking him in the act. At the same time a further number of photographers were intent upon securing views of oppressors and oppressed.

This evening a most serious alarm was raised. Something had occurred which was calculated to shake the universe to its foundations. It was found that a firefly had obtained access to the exposing-room attached to Professor Barnard's large telescope. One can imagine what the consequences might have been had not this been discovered in time. As it was, however, after much exertion, the intruder was expelled with ignominy.

Among the negro population in these districts, opinion seems to be very much divided upon the subject of the eclipse. Those who have seen something of the equipment of our camps confidently predict fine weather for the 28th. "Dese folks know all 'bout it," they say. "Spose dey come heah an' spens all dis money ef its gwine ter rain? Not much, dey don." From the outlying districts, however, we hear equally confident reports that "dey ain't gwine ter be any 'clipse dis time, I reckon. Didn' dese heah 'stronomers say, las' yeah, dey was gwine ter be shootin' stars? An' dem shootin' stars didn' come off; so you kin bet dis heah 'clipse ain't comin' off."

At the present moment we are full of pleasant anticipations for to-morrow. The sky is faultless. The barometer is rising, and the forecast predicts that no eclipse has ever been observed under conditions more favourable than those that will prevail during the occasion upon which all our immediate hopes are centered.

NEVIL MASKELYNE.

Klondik Hotel, Wadesboro, N.C., May 27, 1900.

THE PARIS EXPOSITION.

We stated last week that there would be no awards for British photographs at this year's Paris Exposition. As we have many times pointed out, they form a comparatively small and by no means representative loan collection. Exhibitors of apparatus, &c., are, however

classified as competitors. To them the composition of the "Jury for the French Section, Class XII," and the International Jury, will, doubtless, be of interest. According to the *Moniteur*:

By decree of the President of the Republic, given by request of the Minister of Commerce, the following gentlemen have been nominated as members of the Jury: Braun (Gaston), photographer to the National Museums; Jury, Paris, 1889; Committee, Paris, 1900. Bucquet (Maurice), President of the Photographic Club; Committee, Paris, 1900. Demaria (Jules-Joseph), President of the Syndical Chamber of Photographic Manufacturers and Dealers. Fleury-Hermagis (Jules), optical instruments; Committees, Gold Medal, Paris, 1900; Honorary President of the Syndical Chamber of Photographic Manufacturers and Dealers. Marey (Dr. Jules Etienne), Member of the Institute and Academy of Medicine; Scientific Chron-ophotography; Honorary Member of the Photographic Society of France and the Paris Photographic Club; President of Committees, Paris, 1900. Nadar, junr. (Paul), portrait photographer, Gold Medal, Paris, 1878; Grand Prize, 1889; Committees, Paris, 1900. Provost (Antoine), photographer, Toulouse; Silver Medal, 1889. Vidal (Léon), photographic journalist, Gold Medal, Paris, 1878; Jury, Paris, 1889; Committee reporter, Paris, 1900; Honorary President of the Syndical Chamber of Photographers. Wallon (Etienne), Professor of Physics at the Janson-de-Sailly Lyceum; Committee of Admission, Paris, 1900.

Substitutes: M. Bourgeois (Paul), amateur, General Secretary of the Paris Photo-Club; Committee of Installation, Paris, 1900. M. Geisler (Louis), papers, photogravure, various printing processes; Committees, Paris, 1900.

By a second decree, dated May 22, 1900, the following nominations were also made: As substitute: M. Boyer (Paul), portrait photographer, Gold Medal, Paris, 1899; Committee of Admission, Paris, 1900.

As member: M. Davanne (Alphonse), Vice-President of the Photographic Society of France; Committees, Jury, Paris, 1878 and 1889; Vice-President of Committees, Paris, 1900.

The investiture of the International Juries took place on May 23, under the presidency of M. Millerand, Minister of Commerce, in the large hall of the Trocadéro.

The following are the foreign members of the International Jury: Sir William Abney, England; Messrs. Cameron, United States of America; Desmazières, Greece; Dr. Eder, Austria; Engelsted, Denmark; Kawamura, Japan; Miethe, Germany; Pricam, Switzerland; X. ? Italy.

The Bureau of the International Jury was formed on May 26, and consists of the following members: President, M. A. Davanne; Vice-President, Dr. Eder; Reporter, M. Léon Vidal; Secretary, M. Pricam.

The work of the Jury will soon be started. At the inaugural meeting it was decided that the substitutes should have the same deliberative powers as the members.

THE COLOURS OF THE SILVER IMAGE.

METALLIC silver occurs in fixed photographic films in several very different forms, in gelatine negatives we have a pure black form, in printing-out paper, fixed and not toned, a bright yellow kind. Observations of the development of faintly printed gelatino-chloride pictures with nascent silver prove that, besides the above kinds, there are many others, such as red, brown, olive, green, each in several different shades.

As I have already pointed out, there is no doubt that the colour of the silver is only determined by the different sizes of the individual particles of silver, which are imbedded in the vehicle; the finer the grain, that is to say the fewer the molecules which combine to form a complex, the more the colour of the image tends to red or yellow.* The black images are always considerably coarser-grained than the yellow and red.

I have made some observations which prove that the colour is only dependent on the size of the particles of silver.

* *Photographische Physik*, p. 19.

If a faintly printed aristotype print* is placed in an aqueous solution of gallic acid, there is obtained after short development and fixing a yellowish-red print, after long development brown, and finally green, to greenish-black images. The longer the print stays in the developer, the larger the grain becomes by the accession of nascent silver.

That in this case nothing else can happen is well seen if a print, which has been developed too long, is reduced with hyposulphite of soda, to which some potassium ferricyanide is added. The green form of the silver goes again into the brown, and then into the red.

In the development of Pan paper† there is no accretion of metallic silver on the exposed grains of the silver haloid. The yellow and red tones appear then, if the paper is exposed for a long time and if a diluted developer is used. The reduction of the silver haloid is then confined to the extreme outside of the individual grains. With short exposure and development with a strong developer, the silver haloid grains, on the other hand, are finally reduced through and through, and the brown or greenish-black form is produced.

It is possible moreover, as I have already‡ pointed out, even with dry plates which possess a very coarse bromide of silver grain, to obtain the red form of silver by confining the reduction to extreme outside of the silver haloid; sodium hydrosulphite develops a chloro-bromide plate which has been considerably over-exposed red, as do also some vanadium and molybdenum salts, but this last process is not suitable for practical work.

R. E. LIESEGANG.

FOREIGN NEWS AND NOTES.

Fiat Negatives and Process Work.—Professor A. Lainer, in the *Photographische Correspondenz*, draws the attention of the process worker and the collotyper to the use of hard-printing silver papers as an aid to obtaining good results. In Germany a series of hard-printing collodio-chloride papers is sold in three grades of intensity, and their effect may be enhanced or reduced by the process of toning. The combined toning and fixing bath gives most contrast. This may be somewhat reduced by washing the prints before toning. Intermediate effects are obtainable by separate toning and fixing baths. In the ordinary course a flat negative has to pass through the retoucher's hands before it is fit for process work, so that the gradation throughout the picture may be improved. Even then the result is often far from satisfactory, as hand work cannot rival the subtle tones of a good negative. Two process prints are given in the *Photographische Correspondenz* to illustrate Professor Lainer's point. The block for one of these has been made in the ordinary way, and gives a flat, unsatisfactory result. The subject is a river landscape, with high lights on the water in the foreground, trees in the middle distance, and some delicate half-tone in the distance. The second block has been made from a print upon a medium grade of these hard-printing papers, and gives the landscape all the requisite vigour in the high lights of the foreground and distance.

Plate-sunk Mounts.—An illustration is given in the *Photographische Correspondenz* of a simple piece of apparatus devised by Herr Kosel, Baron Albert von Rothschild's assistant, for producing the effect of a plate-sunk mount. A flat rule is fastened, by a hinge, to a board of suitable length. The other end of the rule is provided with a thumbscrew, by means of which it may be firmly secured to the board. The mounted print is firmly clamped between the rule and the board, so that the exact margin is left between the print and the rule, to represent the plate mark. A wooden block, resembling in shape the head of a claw hammer, is then passed along the surface of the mount, with some pressure, next the straight-edge. Each of the four sides is treated in this manner, and the effect is an impression resembling the mark produced by a plate in the press. According to

* Gelatino-chloride of silver, with excess of silver nitrate.

† From the advertisements of this paper which have been introduced commercially by Ed. Liesegang, we imagine this to be similar in character to the now well-known "gaslight" developing papers.—EDS.

‡ *Photographische Archiv*, 1895, p. 284.

le illustration, a thin slip is fixed to the board underneath, half the length of the rule at the end provided with the thumbscrew. This half of the rule is used for impressing drawing-paper, whilst the other is used for cardboard mounts. If a sheet of paper be laid upon the print before the pressure block is applied, the cardboard will retain its original appearance, but otherwise the surface will be unburnished.

Yellow Stains on Negatives.—The *Photographisches Wochenblatt* states, on the authority of Professor Namias, that yellow stains may be removed by means of a two per cent. solution of ammonium persulphate. To eliminate the reducing action of the salt, a few drops of ammonia are added to the solution. The activity of the salt as a solvent of silver is only manifest when the solution is acid. In the neutral and alkaline states silver is not affected by it. The monoxide compounds of silver are, however, soluble in alkaline persulphate, and it therefore seems probable that the yellow stains are due to such forms of silver.

Photography in Churches.—Monsieur E. Mouchelet raises the question, in the *Photo-Gazette*, of the right to photograph in churches and similar edifices. His remarks, of course, only apply to France, but there are numbers of Englishmen who are seriously interested in church architecture, and carry the camera with them, when visiting our friends on the other side of the Channel, and naturally avail themselves of every opportunity of obtaining records of the many beautiful churches there. Monsieur Mouchelet admits that the question is a delicate one, but states that in the majority of cases the churches belong to the State or the parish. Private chapels, of course, are the property of the congregations. The priest, or curé, is only the usufructuary, and not the owner, but he is the guardian of order in the building. Should the taking of a photograph, when the building is not used for any kind of worship, be deemed an offence? Has the curé the right to exclude the camera any more than an umbrella, walking-stick, or similar impedimenta? The crime would seem to consist in taking the cap off the lens, but can such an act be stretched to the extent of assuming the proportions of an offence against decency or order? Monsieur Mouchelet holds that it cannot, and that the curé would exceed his duty in excluding the photographer under such circumstances. He recommends, nevertheless, as a matter of politeness, that permission be asked, and the archaeologist will frequently find this to his benefit, as there are many objects of great interest in French churches which might otherwise escape his attention.

Edouard Mantois.—The *Photo-Gazette* records the death of this celebrated manufacturer of optical glass. The business, of which he was the leading spirit, was started by Guinand about sixty years ago in Paris, and was subsequently managed by Feil. The firm became noted for the excellent crown and flint glass it manufactured. In 1885 Mantois was brought into the business for family reasons, and two years after he assumed the entire management of the firm. Although he had been brought up as a notary, and had not received special education for the branch of manufacture he was called to, he, nevertheless, conducted the business with such signal ability that it became of marked importance to scientific opticians. Under Mantois' auspices the discs of glass for the Yerkes telescope and the present gigantic instrument at the Paris Exhibition were made. The lens of the latter is one and a quarter metres in diameter. It is curious to note that in 1880 the firm experimented in the manufacture of baryta glass, which has since become of such importance in photographic optics, but it seems only to have been used by makers of artificial diamonds, and then lost sight of until the lenses made with Jena glass became famous. Mantois recognised the danger which menaced the French trade in optical glass when the important innovations at Jena became known. He determined to compete, and, assisted by M. Verneuil, in the course of a few years produced a series of new glasses. In 1889 Mantois was awarded the principal prize at the Paris Exhibition. Similar success attended him in Brussels in 1897. In 1889 he was made

Chevalier de la Légion d'Honneur, and, doubtless, higher honours would have been conferred upon him in Paris this year had he been spared.

German Patents.—We recently drew attention to the unsatisfactory state of the British Patent Acts from the point of view of the patentee. The situation in Germany is not ideal, and we could point to cases of decided hardship which have arisen under German law, but the following statistics prove that numbers of doubtful, if not worthless, patents would have been granted if a similar system prevailed in Germany to that in our own country.

The *Deutsche Photographen Zeitung* states, on the authority of Mr. Alfred Joseph, of Hamburg, that, in the year 1899, 21,080 patents were applied for in Germany. Of these only 7430 were granted. The following figures relate to the photographic section:

	1895	1896	1897	1898	1899	1877 to 1899.
Applications ..	128	175	175	205	256	1970
Granted	50	46	53	44	73	766
On January 1, 1899, there were still under consideration					200 applications.	
During the year 1899 there were ..				256	"	
Total				456	"	
Deduct withdrawn, refused, &c. 108					"	
Granted			73	187	"	
Still under consideration on Dec. 31, 1899				275	"	
Of these 275 applications 8 date from the year 1897 56 " " " 1898						
211 " " " 1899						

Of the 766 patents granted from 1877 to 1898, 547 expired within that period, and 47 in 1899. On January 1, 1900, there were, consequently, 172 patents still in force relating to photography. The oldest of these relates to a process for printing coloured collotypes. It is No. 39,660, dated July 24, 1886, and was granted to J. F. Meisner, of the firm of Meisner & Buch, Leipsic.

The Effect of Light on the Eyes.—The *Deutsche Photographen Zeitung* states that a Russian physician has come to the conclusion that electric light is least, and candle light most, injurious to the eyes. This is based upon observation of the number of times the lids are closed in a given time under otherwise similar conditions. The more often the lids are closed, the greater the fatigue and consequent injury. The following figures represent the number of times the lids were closed per minute:

Candle light	6½
Gas	2½
Sun	2½
Electric	1½

FILMS VERSUS PLATES.

AMONG a very large number of old and experienced photographers there has been, and still is, a considerable amount of prejudice against films, and this has greatly influenced many of the younger and less experienced, who look for correct advice from those who have made their mark long ago. Now, it seems a pity that, through a misapprehension brought about partly by prejudice, a good thing should become prohibited to those who otherwise would fully avail themselves of its advantages.

A young man starting in business was once given this wise advice, "If you want to be successful, take counsel with those who have been successful before you." The same applies to users of films, find out a successful worker with films and he will put you on the right track. Those who never do any good work with films cannot help you, but their prejudices will be catching, and then you will find it difficult to believe that you have blundered. The poor film will consequently get the blame.

It is my lot to have thousands of film negatives come under my notice during each year, some made by experts, but the majority by the ordinary amateur who works more or less in a mechanical sort of way.

My experience in investigating the causes of faults has led me to the conclusion that, in the majority of cases where unsatisfactory results have been obtained, they would have been avoided if a few simple rules had been adhered to.

Of course, I do not mean to say that films have no faults. A certain percentage of these will occasionally be met with, and the same thing applies to glass plates; but they are the exception and not the rule, as some seem to suppose.

When one considers that films weigh ounces as against pounds in the case of glass plates, that films are practically unbreakable, and that one hundred can be stored in the space of one inch without the chance of damage, the desire to use films grows stronger.

When also we remember that thousands of photographers are producing results on films that satisfy the most exacting expert, it seems well worth the while to carefully ascertain why we are not ourselves able to do the same. At a lecture I gave last year at the Athenæum, Manchester, I projected on the screen a number of lantern slides (which are a severe test for quality) made from Frena film negatives. A well-known photographer in the neighbourhood was present, and he has told me since that it set him thinking. He asked himself the above question, which has resulted in his adopting films for hand-camera work after years of prejudice, with first-class results.

Now for a few remarks about the films themselves. My knowledge lies chiefly in the direction of cut films, and it is of these I write.

A few years ago the treatment of celluloid as a support for the sensitive film was not properly understood, and how to avoid defects had to be learnt by mistakes, time, and experience. This want of experience, which time alone could give, was the cause of the bad films of days gone by. Now all this is changed. Time has made the manufacturers of to-day so well acquainted with defects and remedies that the chances of faults with any good brand of films are exceptional.

Choose therefore a brand of films by a maker who has had such experience, and who has made careful study to rectify the faults discovered. These brands are easily selected because they are few. They will be the well-known makers upon whose films good work has been recorded.

Do not expect to do rapid work on a slow film; there are as rapid films as plates for those who require them.

Do not develop with pyro and ammonia; this does not suit all brands of films; any other developer will do. I prefer pyro and soda.

Pour the developer on to the film, and shake the dish rapidly from side to side instead of rocking, and the film will lie flat at the bottom of the dish. Rocking is liable to cause the film to float occasionally.

Carry development rather further for films than for glass plates.

If you use rapid films, do not be sure your dark-room lamp is quite safe until you have tested it. Put an unexposed film about the same distance from the light as you would place the dish when developing; place a penny on it and leave it for five minutes. Then develop the film far away from the light, and, if the film is fogged except where the penny protected it, you may be sure your light is not safe. Many professional photographers have been surprised to find their dark-room lamp unsafe for rapid plates or films.

It is easy to think you are not over-exposing, but very easy to do so. Prove this for yourself: Make three exposures with rapid films on the same well-lighted subject at three greatly differing exposures, say $\frac{1}{10}$, $\frac{1}{20}$, and $\frac{1}{50}$ of a second, and you will probably find that the exposure that was much shorter than you would have dared to have given under ordinary circumstances will be best.

Do not use acid hypo for films; it does not suit some brands.

Wash your films in an ordinary plate rack in pairs, back to back.

Dry your films by hanging them to a board with their faces outwards. Ordinary tie clips will be found useful for this purpose, or dark-room pins will answer as well.

If the latter are used, cut the burr off the negatives before packing them together, or they will get scratched.

Print your films in frames containing a piece of glass. Take care the glass is free from flaws or scratches.

Store your film negatives in albums containing transparent envelopes. You can then easily select any negative by transmitted light without interfering with the others.

Films by any good maker will keep as well as plates. I have some good negatives made on films kept six years before exposure.

Small tins sealed with surgeon's plaster make a convenient method of packing for abroad.

Finally, do not condemn films because your experience long ago was bad, or because your one experience was unsatisfactory. Things disliked at first sometimes become our pet choice.

F. O. BYNOE.

THE PREPARATION OF PLATINUM PAPER.

The organic salts of sesquioxide of iron are reduced by light to protide salts. If paper be coated with a solution of such a salt, and exposed under a negative, a faint positive is obtained which can be turned into a serviceable print by treating it with a substance that will react with the reduced iron salt to form an insoluble coloured deposit, and will not react with the unchanged ferric salt. Three such substances in common use are red prussiate of potash, a solution of silver, and one of platinum, which form, with the reduced iron salt, Turnbull's blue, metallic silver, and metallic platinum, the resulting prints being known as the blue print, the kallitype, and the platinum print.

The iron salt used in the platinum process is the oxalate. The ferrous oxalate formed by the action of the light must be brought into a soluble condition before it will reduce platinum. It is insoluble in water, but soluble in solutions of several of the alkali salts, one of which, therefore (usually oxalate of potash), together with the iron oxalate and the platinum salt, form the three essential constituents in the platinum process.

There are three methods of preparing the print. The paper may be coated with the iron solution, printed and developed with a mixture of platinum and oxalate of potash; it may be coated with the iron and platinum, and developed with the oxalate of potash; or it may be coated with all three, and printed as a printing-out paper. These three methods do not give equal results. Each has its advantages and disadvantages, and, on the whole, it can be said that in the order above given the convenience in manipulation increases and the quality of the print decreases. The printing-out paper is still manufactured, and on the market, usually under the name of Pizzighelli paper. It gives good results where soft prints are desired from dense, contrastful negatives, otherwise it is inferior to the more popular paper with platinum and iron, which is easy to manipulate, and which gives better results in the majority of cases. The paper containing iron only, to be developed with platinum and oxalate of potash, is no longer on the market. It has been pushed out by the ordinary paper, probably because the developing was more expensive and more difficult, and the quality of the result very much the same.

The method in common use by those who prepare their own paper is also that with iron and platinum in the paper. With this method it is not difficult to obtain satisfactory results; these results are, however, only exceptionally equal to those obtained with ready-made paper, or with self-prepared paper with platinum in the developer. A good platinum paper should, when made for soft effects, give a print that is free from fog, with pure whites and good deep blue-black tones in the shadows, and at the same time soft. When made for brilliant effects, the whites should be pure, the deep shadows should be intensely blue-black, not easily solarised, and clear, and the deep half-tones should stand out from the shadows. A good ready-made paper, such as that of the Platinotype Company, possesses these qualities almost as far as is possible with a paper of a single degree for brilliancy. Self-prepared paper, with platinum in the sensitising solution, is uneven in its results. At times, under conditions which it is not easy to control, it is very satisfactory. Again, it shows a tendency to give hazy, foggy prints when made for soft effects, which can only be prevented by the addition of substances that make the print too brilliant. In the more brilliant paper the shadows, which examined alone appear to have a very satisfactory deep blue-black tone, grow faded and brown when compared with a print on ready-made paper, or on paper with platinum in the developer.

The latter method has two disadvantages. The platinum is deposited more upon the surface of the paper, and is consequently more apt to float off into the developing fluid, and the latter must be very carefully and evenly brushed over the print to avoid streaks. These are not serious evils, as they may be prevented with a little care. In every other respect the method is better than the other. It requires less platinum, it offers a wider range from softness to brilliancy, the print solarises less readily and is more visible, and therefore more easily controlled in printing, it gives with more certainty deeper and bluer blacks, with more detail in the shadows, and the prepared paper keeps better, especially in hot weather.

The following directions for the preparation of prints by this method are based on those given by von Hübl in his book, *Der Platindruck*, with a few changes and additions:—

The character of the paper plays an important rôle because the print lies directly on its surface. Small prints depend for their effect upon details and require smooth paper. Large prints, especially when the subject is in part out of focus, gain in artistic effect when made upon rougher paper. For small negatives, up to quarter-plate or 4×5 , two

xcellent papers are the ordinary Rives smooth 19 kilo normal platinum paper, and the fine grain pyramidinkorn paper made by Schaeuffelen in Heilbrunn in Germany. The latter paper has a file-like surface, fine enough to preserve the details, which by preventing reflection increases the depth of tone in the shadows, and which gives an agreeable effect otherwise. This paper is made in at least two thicknesses, and with two or more grains. The heavier is excellent for making post cards, the lighter coarse grain is suitable for medium-sized portraits. For half-plates and larger sizes two good papers are the 21 kilo rough and 32 kilo rough Rives' paper.

These papers should be first coated with a thin gelatine solution, prepared by heating 2 grammes of gelatine in 250 c. c. of water until it dissolves, adding $\frac{1}{2}$ to 1 gramme of alum, and straining through a handkerchief. The paper should be tacked to a clean surface, painted with the warm solution and laid over a chair, or hung up, to dry. The pyramidinkorn paper requires a more careful treatment. When the moisture begins to disappear, the excess of the gelatine solution should be removed with a sponge squeezed as dry as possible, or it should be spread evenly over the surface with a wide soft brush. If this is not done, the gelatine will settle in the hollows and form shiny scales. The object of this preliminary sizing is to prevent the sensitising solution sinking into the pores of the paper. The paper takes a more even coating, and the tone of the print is bettered. The papers above mentioned are well sized and need only a weak coating. More porous papers require a more vigorous treatment. The sizing should be repeated, or the gelatine solution made stronger, or the paper should be soaked in a large dish of the warm solution. A too heavy sizing causes the platinum to be reduced by the iron after the latter has been dissolved off the paper. In the beginning it is better to buy the paper ready prepared with gelatine. Hand-made water-colour paper is sized with animal glue, which seriously hinders the reduction of platinum.

The iron solution, which should be prepared by artificial light, is made by adding all at once to 100 c. c. of water, 25 grammes of ferric oxalate in scales, 2 grammes of oxalic acid, and 1 gramme of lead oxalate. The mixture should be shaken for a quarter to half an hour, and filtered into a brown glass bottle. The lead oxalate is not very soluble, and may not wholly dissolve. The greater part should, however, and if it does not it is because the iron oxalate contains sulphate, in which case the solution should be filtered and a second gramme of lead added. The oxalic acid prevents rusty brown tones; the lead oxalate, according to Von Hübl, causes the platinum to be more thoroughly and quickly reduced.

Two platinum solutions are required: a solution of 1 gramme (15 grains) of chloro-platinite of potassium in 6 c. c. of water, and of 1 gramme of sodium platinic chloride in 6 c. c. of water.

The addition of a small amount of quicksilver or of platinum to the iron solution is necessary. The latter is supposed to more effectually prevent the floating off of the reduced platinum in developing, and by varying the proportion of the two platinum salts the brilliancy of the paper is easily and exactly controlled. For soft effects, 1 part of the potassium platinum solution should be added to 10 parts of the iron solution. For extremely brilliant effects, 1 part of the sodium platinum salt should be substituted for the other. Between these extremes all grades of brilliancy can be obtained by substituting for a part of the one an equal volume of the other. In the majority of cases the correct proportion will lie between 0.8 parts potassium platinous chloride to 0.2 parts sodium platinic chloride and equal parts of each. The two platinum salts should be added separately to the iron; mixed alone, they precipitate potassium platinic chloride.

It is advisable to prepare the paper on a small scale, especially at first. The iron solution is conveniently measured in a 10 c. c. measuring glass, and the two platinum solutions by drops, with the assumption that twenty drops make a cubic centimetre. The two proportions given above then become, for instance, iron solution, 2½ c. c.; potassium platinum solution, 4 drops; sodium platinum solution, 1 drop; and iron solution, 3 c. c.; and 3 drops each of the platinum solutions.

The solution, poured into a teacup, should be painted evenly over the paper with a brush, and the paper allowed to dry at the room temperature for twenty minutes to half an hour. The drying should then be finished by artificial heat at not too high a temperature. The rate at which the paper dries is an important factor in this method with platinum in the developer. If the paper remains moist for an hour or two the iron will lose in sensitiveness, and the resulting prints will have a faded brown tone. If, on the other hand, the paper be dried too quickly, the entire picture will swim off the surface of the paper when the print is developed. It has already been said that a too heavy sizing has the same effect, and

these are the two principal causes of this, the most serious disadvantage of the method. Two others are a too concentrated iron solution and a too vigorous application of the developer. The same volume of sensitising solution will cover a larger surface of smooth firm paper than of coarse porous paper. With the latter more iron will be reduced than can be replaced by metallic platinum, and the latter will be reduced in the developer and may deposit on the high lights. The iron solution should, therefore, be diluted for such papers, according to Von Hübl, with 3 to 6 c. c. of water for every 5 c. c. of sensitising solution. For the smooth Rives paper the solution need not be diluted. For the other papers mentioned above, 1.5 to 2.5 c. c. of water may be added. The degree of dilution depends on the temperature and dryness of the paper, and on the nature of the preliminary sizing as well as on the paper itself, and it must be determined by each for himself. Excessive dilution gives a paper which solarises easily, and on which the print is only faintly visible during the printing. It also gives prints with heavy shadows without detail.

The developer consists of 1 part of the chloro-platinite of potassium solution and 10 parts of a solution of—

Potassium oxalate	100 grammes,
Potassium phosphate	50 "
Water	1000 c. c.,

or of—

Potassium oxalate	160 grammes,
Potassium phosphate	8 "
Potassium sulphate	1 gramme,
Water	480 c. c.

or of the ordinary developer used with ready-made platinum paper. With ordinary platinum paper the developer may be applied very carelessly. When platinum is added to it, more care is necessary. One should not use a pig's-bristle brush, but a soft flat camel's-hair brush, at least $1\frac{1}{2}$ inches wide for small, and 2 or $2\frac{1}{2}$ inches for larger prints. It should be drawn lightly and steadily across the print and dipped into the developer after each stroke, to avoid streaky results. After the print has been thus quickly and evenly wet, it should be left undisturbed for a few seconds. One should not be disturbed by an apparent utter collapse of the picture, for a presentable print may still be obtained. At the same time if the developing fluid grows very black with suspended platinum after two or three prints have been developed with it, one should seek to prevent this by reducing the strength of the gelatine sizing solution, by diluting the sensitising solution or by drying the paper more slowly. A slight turbidity does not matter. Unexposed prints improve slightly by being kept wet with the developer for five or ten minutes.

The prints should be washed in two or three changes of acidulated water, containing 1 part of hydrochloric acid in 50 to 80 parts of water, and finally in running water.

In place of the sodium platinic chloride, a second iron solution, containing 0.5 gramme of chlorate of potash in 100 c. c., may be substituted.

For soft prints one then proceeds as before directed, and replaces with successive parts of the first iron solution for an equal volume of the (so-called) chlorate iron solution, using in every case one volume of chloro-platinite of potassium to ten volumes of the mixed iron solutions.

The ordinary platinum paper with platinum in the sensitising solution may be prepared according to the two methods given above by raising the proportion of platinum solution to iron solution from 1 to 10 up to 1 to $1\frac{1}{2}$. For soft effects, for instance, $1\frac{1}{2}$ c. c. of iron to 1 c. c. of chloro-platinite of potassium should be diluted as above directed with water, and the paper dried at once by artificial heat. For increase in brilliancy either the iron solution should be in part, or in extreme cases entirely replaced by an equal volume of the chlorate iron solution, or the potassium platinum solution be replaced in a similar way by the sodium platinum solution. A soft-working paper can be made to give more contrast by over-printing it and developing with the oxalate-phosphate-sulphate solution diluted with 5 parts of water.

The papers mentioned here can be had either "raw" or "foreprepared" with gelatine, as the Germans say, from Dr. Jacoby, 52, Thurmstrasse, Berlin, N.W., who manufactures platinum paper and the materials for its preparation. The cost of packing and forwarding by parcels post is about 2s. 6d. for 11 pounds. From him one can obtain the two iron solutions and the two platinum salts, lead, oxalate, measuring glasses, &c. Dr. Jacoby's iron solutions give good results, although, for the method with platinum in the developer, the grain of lead oxalate should be added. If one prefers to make one's own iron

solution, which is to be recommended, the iron oxalate of Dr. Schuchardt, manufacturing chemist, in Görlitz, Germany, will be found to give good results.

The exact measuring of the small quantities of platinum solution required for preparing paper on a small scale is most conveniently made in drops. Ordinary dropping bottles are inconvenient for strong solutions. One can drop from ordinary cork-stopper bottles with perfect security if the neck and lip be first wet with the solution. The size of the drops varies, however, from 8 or 9 to a c.c. up to 20, according to the rate at which they fall and whether they drop from the lip or from the neck of the bottle. The sodium platinum chloride solution has a very marked effect even in small quantities, and a more reliable arrangement for measuring it is desirable. A fountain-pen filler inserted in the cork is convenient, and, if one is skilful enough, a 3 to 5 c.c. pipette, divided into $\frac{1}{2}$ c.c., is still more so; or one may use a conical minim glass of the smallest size.

For converting the weights and measures here given into those of the English system, it is sufficient to remember that a c.c. of water weighs a gramme; that a fluid ounce of water weighs an ounce avoirdupois; that a gramme equals 15 grains, a c.c. equals 17 minims, and that a fluid ounce equals 28·4 c.c., and therefore an avoirdupois ounce equals 28·4 grammes.

Snap-shot negatives and bits from larger negatives give, with either method, very attractive prints on post cards made from pyramidinkorn paper; the space to be printed in should be outlined in pencil, and washed in, with sensitising solution, by means of an ordinary water-colour quill brush, the edges being left somewhat ragged. If the print be developed without platinum, a faint image will be obtained, which may be written upon or coloured with water-colour paints.

The self-preparation of the platinum print is such a charming and agreeable process that no article upon it is complete that does not—and in fact almost all do—hold forth its merits, and the fact that it is not in such common use as it should be. It requires a harmonious and fully exposed negative. Harsh lights, with broad shadows without details, do not give satisfactory results, nor does a commonplace negative. The bromide print, with its poorly concealed film of gelatine, is an altogether inferior thing, the use of which is inexcusable, except for enlargements or when good sunlight cannot be had. A total of half a grain of platinum will cover a sheet 20 x 26 inches, which will make three dozen $\frac{1}{4}$ -plate prints. The other materials being cheap, it is therefore not more expensive than other photographic papers, and has the advantage over the ready-made platinum paper, in that one always has it fresh and can select the paper and preparation most suited to the negative.

It should therefore be added for the benefit of those who, not having tried it, are not taken with the idea of painting paper with a platinum solution at five or six shillings an ounce, with nine chances in ten that the picture will float off or be otherwise valueless, that the process is, in fact, easily mastered, and is exceedingly fascinating. There are no expensive toning baths, no hypo to wash out, no stains, no surface to scratch and peel off. When one feels the inclination to make a print, the room is darkened, the bottles and a roll of paper are produced. A few drops of each solution in a teacup, and the paper is coated, dried, and is ready for use. It prints very quickly in good light. After printing, there is only a dash of a brushful of developer, a plunge into an acid bath, ditto into another, a wash under the tap, and the thing is done—clean, quick, satisfactory, and permanent.

W. S. DAVENPORT.

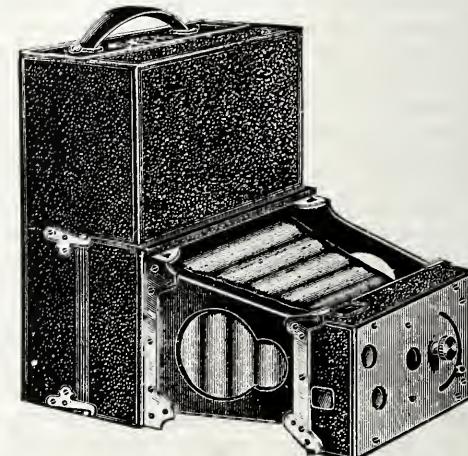
THE FUTURE OF CHEMISTRY.

In the "mysteries of chemical energy" photographers are more or less directly interested. Our contemporary, *The Scientific American*, in a short article on the subject, points out that our modern system of mechanics begins practically with the invention of means for measuring force and for calculating its effect upon matter. Mechanics have not alone profited by the labours of Helmholtz and Maxwell, Robert Mayer, and Joule; the achievements of these physicists were also the means of elevating chemistry to the rank of an exact science. Chemists were compelled to retrace their steps, to re-explore fields which they thought had been thoroughly investigated, and to study old processes in the light of the new discoveries. The laboratory investigator was no longer content to measure only the matter at his disposal, he found it necessary to know how great was the force released or rendered latent by chemical processes. Thus it was that thermo-chemistry originated; and thus the

prophecy made by Richter one hundred years ago, that chemistry was but "a branch of applied mathematics," was fulfilled. The gap that once separated physics from chemistry is now bridged. Our study of the phenomena of dissociation and of dissolution carries us directly into the province of molecular physics. But, great as the strides have been which chemistry has made within the last half-century, proceeds our contemporary, there still remains many a weary path to be pursued. Although physicists have done much to clarify the chemist's conception of matter and force, they have not told him all. Those seventy elements which are daily used in the laboratory, surely they are but the variant forms of a single matter. We have but one force; and why should there be seventy matters? That wonderful periodical law, with its puzzling numbers, seems to contain within it the means of discovering the primeval matter for which chemists have long been seeking. The old alchemist with his theory of the transmutation of elements again lives; but he is now a chemical physicist, who endeavours not to convert a base metal into gold, but to prove the existence of one form of matter. The mysteries of chemical energy are also still to be unfathomed. The forces which we have learned to observe and to measure are phenomena of a secondary nature. The chemical energy whose transformations give rise to these forces is still a puzzle to chemists. Instruments of measurement can reveal only the sum total of this energy, but not the nature of the intramolecular changes which occur. For this reason we have no clear conception or numerical expression for the relation of chemical energy to other forces; in other words, we have no chemical equivalent of work. We know that chemical energy is converted not only into heat, but also into light and electricity. That a chemical work can be directly transformed into motion seems also probable. It cannot be for a moment doubted that the problem of chemical energy and matter will eventually be solved. When adequate laws shall have been formulated by the twentieth-century investigator, we may possibly speak of a "mechanical" or "kinetic" chemistry, which will be added to the list of exact sciences.

A NEW FRENA CAMERA FOR GLASS PLATES OR FILMS.

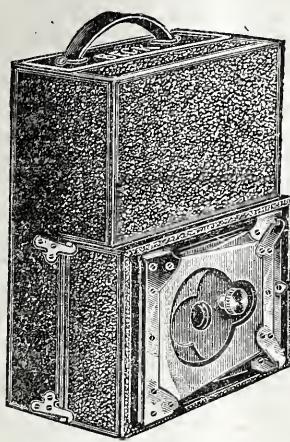
We are indebted to Messrs. Beck for the following details of the new Frena: It is much smaller and more compact than the box form of Frena, and has the further advantage that glass plates in plate-holders may be employed if desired. The first size, which is now ready and called the No. 6 Frena, takes quarter-plate pictures. It has an achromatic single lens with a "fixed focus," whose range of focus includes any object between twenty feet from the camera and the horizon. The same system of magnifiers is used for focussing near objects as is employed in all the fixed-focus Frena cameras. By means of these, objects as near as nine inches can be photographed.



No. 6 Frena. Open.

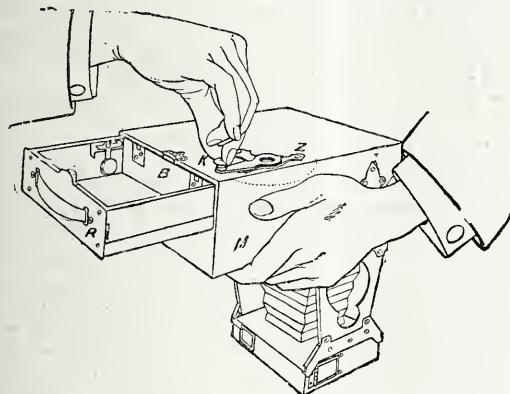
The camera is fitted with two Brilliant "stationary" finders, has diaphragms to the lens, and shutter giving exposures $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{20}$, $\frac{1}{40}$, $\frac{1}{80}$ of a second and time exposures. The film-changing device is on the Frena system, in which the films are dropped into a receiving chamber one by one as exposed. The construction of the film-changing portion is, however, different, the magazine holding the film being drawn out by a slide till it is opposite the receiver, the revolution of a handle then drops the exposed film into this chamber. An automatic indicator records the number of films thus dropped into the receiver.

By means of this new arrangement of the film-holder Messrs. Beck have been enabled to construct the Folding Frena so that the lens,

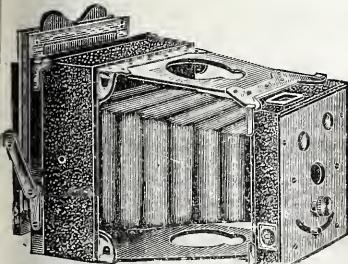


No. 6 Frena. Closed.

lens, and camera can be detached from the magazine and film-hanging portion. In this manner the camera, with the addition of a



ground-glass attachment and double plate-holder, can be used as an ordinary plate camera if desired.



No. 6 Folding Frena, with glass plate attachment.

The camera is of a convenient shape to be slung over the shoulder, and can be easily used whilst still so slung.

Our Editorial Table.

THE "BERTHA" TRANSPARENT COLOURS.

Made by the Vanguard Manufacturing Company, Maidenhead.

THE latest introduction of the Vanguard Company, who are constantly adding to their list of convenient preparations for photographic use is a series of seven concentrated transparent colours in powder for tinting photographs on glass and paper. They should be found of very great service. We quote the excellent instructions given for the use of these colours :—

Add a very small proportion of colour to a little clean water, and work with a brush until dissolved. In this condition the colours are ready for painting transparencies, lantern slides, &c. For tinting prints on platinumotype, P.O.P., &c., the colours may be used in the same way; but better results will be obtained by adding a trace of gum water, and one drop of

glycerine to each ounce of water. A very good medium for use in tinting P.O.P. is the following :—

Dried egg albumen	2 parts by weight.
Water	100 "
Ammonia	2 "

Dissolve the albumen in the water and then add the ammonia. Apply a wash of this medium all over the print, in order to moisten the surface, before applying the colours. Prints on P.O.P. may be burnished after tinting (of course, when quite dry), and will be much improved thereby.

Blending.—It is not advisable to try to get special tints by directly mixing the colours. The correct way is to apply a wash of one colour



and then follow it with a wash of another. Thus, to get various shades of green, apply a wash of blue-green, and follow it with washes of yellow as required. The same remark applies to purple: first apply blue and then follow it with red, &c. There are cases, however, in which various colours may be mixed together with good effect; these will soon be apparent after a few trials.

Complexions.—Apply a very weak wash of brown, and follow with very weak washes of red where colour is most desired.

Colouring Transparencies.—The best plan is to first thoroughly moisten the gelatine surface and then blot off the surplus water. The colours can then be safely applied without fear of forming harsh outlines.

FLEXIBLE PLATE BACKINGS.

Prepared and sold by C. C. Vevers, Grand Arcade, Briggate, Leeds.

We have received from Mr. Vevers a sample of his flexible plate backing. This consists of a fabric coated with a tacky or ever-moist substance which allows of its being placed in perfect optical contact with the back of the glass plate, a necessary condition of the successful use of anti-halatives. We have many times used flexible plate backings of the nature of that now sent us by Mr. Vevers, and have found them effective in practice. They are convenient, cleanly, and cheap.

MR. WALTER D. WELFORD, of Warwick Lodge, 166, Romford-road, London, E., sends us sample prints of a new series of patriotic border negatives which he has just introduced. They are made by the carbon process, and are issued on film in all sizes. Mr. Welford points out that at the present time they should prove attractive to professionals and amateurs in a patriotic frame of mind. The prices are: half-plate, 1s. 6d.; 8½ x 6½, 2s. 6d. According to the prints sent the national flag and other emblems form the subjects of the negatives.

TRAITÉ PRATIQUE DE PHOTOGRAVURE.

LÉON VIDAL. Gauthier-Villars, Quai des Grands-Augustins, 55, Paris.

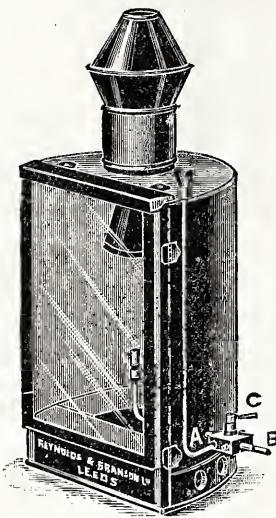
In the present volume Monsieur Léon Vidal gives a practical account of photo-engraving in all its various branches, including line and process work. The subject is not treated from the historical point of view, as the work is intended for instruction. The author correctly states that success very often depends upon dexterity of manipulation, which the professional cannot be expected to make known freely, but the volume contains a description of all the essentials of such process, and with practice the intelligent worker will, doubtless, be able to solve any difficulties which present themselves. The author is Professor at the Ecole Nationale des Arts Décoratifs.

THE "KRYSTOS" NO. 3 DARK-ROOM LAMP.

Manufactured and sold by Reynolds & Branson, Ltd., 14, Commercial-street, Leeds.

MUCH experience in the use of dark-room lamps of varied orders of design and construction led us to direct particular scrutiny to the

Krystos, which Messrs. Reynolds & Branson have kindly brought under our notice. Of one of its features we can speak with especial praise, for very often in the course of an evening's work we find ourselves called upon to develop negatives and expose bromide prints and binocular transparencies. This lamp answers for all three purposes. As the makers point out, the special tap and arrangement of burners enables the operator to use either the jet inside the lantern for non-actinic light or instantly to alter this to an invisible light, and, by the same action, turn on to full the outside jet, which is then available for lighting the dark room, or for printing transparencies or bromide prints. By turning the tap to B, both jets are at once reduced to a by-pass light; at A, white



light is obtained; and at C, non-actinic illumination. It is, therefore, easy to ensure instantly either actinic illumination, non-actinic light, or both jets turned to non-luminous lights. In order to ensure the latter, an adjusting screw is fitted to the tap, to enable the outside jet to be adjusted to invisibility for any pressure of gas. Another feature is the cone for keeping the body of the lamp cool, the hot combustion products being carried away in three separate channels. The lamp is japanned black outside and white within. It is neatly and strongly made, and decidedly convenient to use. Of course, special glazing may be had to suit individual requirements. At a cost of 10s. 6d. the Krystos lamp is a dark-room convenience well worth having.

"OUR BRITISH GENERALS."

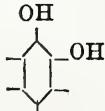
Published by William Tylar, 41, High-street, Aston, Birmingham.

TAKING advantage of the well-merited applause of which the leading British generals in South Africa have been made the objects, Mr. Tylar is issuing a series of collotype portraits of those gallant soldiers. The prints are on sheets 25 x 19 inches, with tinted margins. Portraits of the following are now ready: Lord Roberts, Lord Kitchener, Sir Redvers Buller, Sir George White, General French, General Macdonald, Major-General Baden Powell. The last-named doughty warrior forms the subject of the specimen print that has been sent to us. It is from the well-used negative of Messrs. Elliott & Fry. One shilling each is charged for these portraits, which are excellent of their kind; or a sample is sent post free to any address for 1s. 2d.

PYROCATECHIN "MERCK."

Manufactured and sold by E. Merck, Darmstadt, Germany, and 16, Jewry-street, London, E.C.

PYROCATECHIN (or brenzcatechin), first suggested as a reducing agent some twenty or more years ago, is a di-oxybenzole, having the



formula and it is a beautiful white crystal in the form

of prismatic needles. It is, of course, extremely soluble in water. Some months ago Mr. J. T. Sandell, the inventor of Cristoid, submitted to us a number of exceedingly brilliant negatives made on those films. They were developed with Merck's pyrocatechin, the formula being as follows:—

Pyrocatechin	1 ounce or 30 grammes.
Potassium bromide	30 grains or 2 "
Sodium sulphite	4 ounces or 120 "
Caustic soda	½ ounce or 15 "
Boiled or distilled water	1 pint or 600 c.c.

One part of this stock solution is diluted with 7 parts of water.

Used according to this formula, pyrocatechin is an energetic developer, and gives greyish-black negatives free from stain.

Merck's chemicals for photography are very pure and carefully prepared products. Some months ago we developed several dozen negatives with pyro-Merck, and were greatly pleased with its behaviour as a reducing agent. Indeed, of all the samples of pyrogallol that we have used, we have handled none better. The sample of pyrocatechin sent us appears to be in all respects excellent.

Studio Gossip.

"SE NON È VERO," &c.—A halfpenny morning paper states that to be "photographed as Kruger" is the latest idea of a suburban artist. By means of a false nose, flowing beard, and tall hat, with a Bible and pipe as accessories, he is "making up" his patrons as the Transvaal ex-President. Many ladies are among his clients, and the originator of this new phase of fancy photography is reaping a rich harvest.

THE Berlin correspondent of the *Daily Telegraph* writes: "It is not generally known that the German Empress is a very skilful amateur photographer. Whenever there are any festivities at Court—and nobody can say that this is seldom at Berlin—her Majesty always manages to select some scenes which she can add to her already large collection. After the Potsdam parade was over, when her eldest son, the Crown Prince, first appeared with his regiment as full officer, the Kaiserin took a number of groups of her sons with the other young lieutenants who had passed their examinations with the Crown Prince. What interested the public most was to watch her Majesty as she turned her lens on to various groups amongst the crowds of bystanders, and it is needless to add that the persons so honoured did their best to stand well for the Royal and Imperial artist. One of the negatives that promised to turn out well represented the pupils of the large Military Orphanage at Potsdam, wearing their new 'Scotch caps' with cockades."

A PALACE OF LIGHT AT PARIS.—The Exhibition Commissioners have surprise in store for visitors to the World's Fair. This is to be a sort of fantastic palace of light, and is described as the crowning marvel of the Exhibition. The wonders of the place have been prepared in the deepest secrecy, and the mystery has been well kept. But they will shortly be ready to be displayed to an admiring public, and some idea of what they will consist of has now been allowed to leak out. The Palace of Light is hidden away between the Château d'Eau and the Salle des Fêtes, in the Galerie des Machines. It will be reached by dark and mysterious galleries. Following these, the visitor will suddenly be brought into a dazzling blaze of light. All around he will see halls brilliantly illuminated with every colour of the rainbow, stretching apparently to an infinite distance, while everywhere designs in luminous arabesques will sparkle in changing hues. This palace of wonders, as the officials who have been at work upon it in secret for months past talk, is like an Arabian Night's tale, but consists, in reality, of an hexagonal hall, each of the six sides of which are lined with mirrors. Thus the designs in electric light on the ceiling and on the walls are reflected *ad infinitum*, the changing hues being easily produced by various sets of coloured globes.

News and Notes.

INSTRUCTIONS have been given to enlist photographers for service with the Royal Engineers in South Africa.

ROYAL PHOTOGRAPHIC SOCIETY.—The Exhibition of photographs by Dr. P. H. Emerson, at 66, Russell-square, may be viewed on presentation of visiting-card, between the hours of ten and four, Wednesdays ten to eight.

THE Publishers' Circular states that Professor Vivian B. Lewes's forthcoming work on acetylene gas will contain over 250 illustrations, and comprise a history of acetylene, its preparation, properties, and chemical reactions, together with a complete list of legal enactments in full concerning its use and manufacture, patents, and other important data. Messrs. Archibald Constable & Co. are to be the publishers.

We have received the annual report of the Stonyhurst College Observatory. The volume details the results of meteorological and magnetical observations, with report and notes of the Director, Rev. W. Sidgreaves, S.J., F.R.A.S., for the year 1899. The following are two interesting extracts from the report:—"Considerable preparations were made for the possible Leonid-meteor shower. Five cameras were mounted for the meteor streaks, and one was attached to the eye-end of the Perry Memorial telescope, with the hope of obtaining a photograph of the meteor swarm as a cluster or comet outside our atmosphere. This was the chief hope of the watch on the morning of the 16th November, for which Dr. Johnstone Stoney had kindly provided the position of the sight-line tangent to the meteor orbit. Unfortunately, the sky, though clear enough for eye observations of meteors to the third magnitude, was too hazy for the feeble light from the distant swarm. Only a few Leonids were seen on this morning, and the preceding nights, from the 10th to the 14th inclusive, were cloudy throughout. The stellar spectograph has been employed on all available nights, to continue the series of photographs intended for investigation of possible changes in the spectra of selected stars. But the work of measuring and mapping these has been interrupted by a corresponding work on the solar drawings of the last nineteen years."

COLOUR VALUES IN PHOTOGRAPHY.—In a paper recently read before the Edinburgh Photographic Society Mr. Cameron Todd remarked: "Happy is the one who is not colour-blind, and I hope none of us photographers are,

otherwise we would not be able to look on nature or the works in colour of famous artists, and see with our eyes the true sense of their beauty. To make ourselves acquainted with nature we must wander by the brook, by the side of the marsh, in the wood, high up the mountain-side, or by the seashore. Let us study the varied colours we come across, the shades of green, which are many, from the dark green of the rhododendron and our old Scotch fir to the olive tints of warmer climes, and we shall see their beauty. In the northern sphere we have a change of aspect much more so than those of southern countries, yet they have beauties of their own. We in this part of the world have for the photographer studies in winter where others would grumble at the cold. Look at him with his camera, hieing away to take some snow scenes, a mist effect, the curler on the ice, or the traceries on the window after a hard night's frost. Again, spring brings you to the budding and bursting to life of dormant nature, which then puts on its mantle so green. The fields are covered with the daisy and buttercup, and, as time speeds on, our gardens are ablaze with flowers of many hues. They are not lasting, for autumn comes, and reveals to us, by its beautiful foliage tints, that coming winter is nigh."

Commercial Intelligence.

MESSRS. TAYLOR & BROWN, chemists, Bedford, have opened a photographic dark room for the use of photographers.

THE Secco Film Company's premises at Molesey are, we are informed, rapidly approaching completion. Machinery of the most modern kind for coating paper has been erected, and it is anticipated that besides negative paper the Company will also be in a position to supply gelatino-chloride and other positive printing surfaces.

THE Comptroller-General of Patents notifies that purchasers of Patent Office publications will in future be allowed to open deposit accounts at the sale branch of the Patent Office, the minimum deposit being 2*l*. The money may be paid in cash, or forwarded by post office or postal order or by cheque, payable to the Comptroller-General.

CATALOGUES have been received from the following: Walter D. Welford, Warwick Lodge, 166, Romford-road, London, E.; the Photographic Department of the Army and Navy Auxiliary Stores, Limited, Westminster, a volume of about 180 pages; H. F. Purser, 33, Hatton-garden, E.C. (agent for the Busch lenses and the Tribees cameras).

AN excellent and comprehensive catalogue of photographic apparatus, extending to 104 pages, reaches us from Mr. F. V. A. Lloyd, of 15, Lord-street, Liverpool. We note that Mr. Lloyd prints a table of weights and measures by the Imperial and metric systems; but in the catalogue itself only the Imperial weights are listed. If weights and measures graduated on the metric system were listed in all dealers' catalogues, the use of the system would gradually extend.

PHOTOGRAPHS BY THE MILLION.—Most people, remarks the *Daily Chronicle*, have either seen or possessed one or more of the excellent little photographs which accompany packets of So-and-So's cigarettes; but few have any idea of the immense number of these which are annually turned out. One firm, which has a factory near London, supplies no fewer than 3,000,000 every year to one customer alone, to say nothing of others. In the case of the British officers who are now so popular, the fee for permission to reproduce is 10*p*. an officer.

PATENTS IN JAPAN.—According to the annual report of the Comptroller-General of Patents, a number of new Acts have been passed in Japan to amend the Law of Patents, Designs, and Trade Marks. Under these Acts the duration of a patent is fixed at fifteen years, and the copyright of a design ten years, subject to the payment of annual fees. The term of protection obtained by registration of a trade mark is fixed at twenty years, except in the case of trade marks previously registered abroad, where the term is the same as that for which the original registration is valid.

THE METRIC SYSTEM IN RUSSIA.—It is probable that the metric system will be introduced before long in Russia; the Bill which has been prepared to this effect by the Minister of Finance has received the approbation of the State Council, with the understanding that the University and the various scientific societies will give their assistance in the verification of the weights and measures necessary for commercial use. The details have been nearly all decided upon, and will be submitted to the Council in the near future. Since 1896 the metric system has been used by the medical service of the army in the compounding of formulae, this having been made obligatory.

A WORLD-WIDE CATALOGUE OF SCIENCE.—In order to inaugurate an international conference on the subject of a universal catalogue of scientific literature, an "At Home" was given by the Royal Society at Burlington House on Monday last. The conference formally opened on Tuesday, and amongst the foreign delegates that have arrived in London are Professors Einosuke Yamaguchi (Japan), Masini (Padua), Ciamician (Bologna), August Heller (Budapest), B. Schwalbe (Berlin), and Dr. Klein (Gottingen). The guests were received by the President (Lord Lister) and the members of the Council. The scheme for an international science catalogue was originated in 1894 by the Royal Society, and the present is the third, and it is hoped the final, conference.

Patent News.

THE following applications for Patents were made between May 28 and June 2, 1900:—

PRODUCTION OF PHOTOGRAPHS.—No. 9900. "Improvements in the Production of Photographs." J. A. JOHNSTON.

NATURAL-COLOUR PHOTOGRAPHY.—No. 9936. "Improvements in Photographic Cameras for Producing and Viewing Images in Natural Colours." Complete specification. E. T. BUTLER.

NATURAL-COLOUR PHOTOGRAPHY.—No. 10,000. "Improvements in the Means for and Method of Projecting or Viewing Photographic Pictures with Natural Colours." Complete specification. R. KRAYN.

CINEMATOGRAPHY.—No. 10,050. "Improvements in Apparatus for Projecting Animated Pictures." Complete specification. T. ARMAT.

NATURAL-COLOUR PHOTOGRAPHY.—No. 10,003. "Improvements in the Method of and Means for the Production of Photographic Pictures which may be Viewed with the Natural Colours of their Subjects." Complete specification. R. KRAYN.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
17.....	South London	{ Excursion : Otford and Eynsford. Leader, C. Churchill.
18.....	South London	{ Intensification. Mr. McIntosh.
19.....	Gospel Oak	{ Debate: Is Tinkering with Developers any use? Negative, Mr. Rayner; Affirmative, Mr. Billingsley.
19.....	Hackney	General Discussion: Printing Processes.
21.....	Croydon Microscopical	Botanical Ramble.
21.....	London and Provincial	Nomination of Officers. - Open Night.
23.....	Aintree	Excursion: Burton Woods by Coach.
23.....	Birmingham Photo. Society	Excursion: Cannock Chase. Leader, J. Page Croft.
23.....	Bootle	Excursion: Chester. Leader, J. M. Dullehan.
23.....	Croydon Camera Club	Excursion: The Home of Charles Dickens. Leader, The President.
23.....	Croydon Microscopical	Excursion: Guildford.
23.....	South London	Excursion: Broxbourne. Leader, G. Brown.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 12.—Ordinary Meeting.—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

NEW MEMBERS, &c.

Three new members were elected, and nine candidates were nominated.

The PRESIDENT announced that the Bury St. Edmund's Camera Club and the Redhill and District Camera Club had been admitted to affiliation.

THE CONSTRUCTION OF PHOTOGRAPHIC OBJECTIVES.

Mr. H. L. ALDIS, B.A. (Cantab), read a very valuable and interesting paper on "The Construction of Photographic Objectives: Mathematical Investigation." The paper was not of such a nature as to admit of condensation. It began with a short account of Petzval's theory of the spherical aberrations of an optical system, enumerated as (1) spherical aberration; (2) coma; (3) astigmatism; (4) curvature of field; and (5) distortion; and geometrical illustrations were given of the manner in which these arise in the refraction at a spherical surface. In the second part of the discourse an analogy was drawn between the spherical aberrations and a system of parallel forces in equilibrium, and it was shown by diagrams and equations that, if an optical system is to be free from spherical aberration and coma, at least three surfaces are necessary, and that to be also free from astigmatism there must be at least four refracting surfaces. Mr. Aldis concluded by discussing the possibilities of improving photographic lenses in the directions of increased simplicity of construction and greater usefulness, the simplest form of complete lens that is theoretically possible, and the simplest forms of combination lenses that can theoretically be constructed. With regard to simplicity of construction, he thought we were still far from the theoretical limits, since it appeared to be possible to construct a perfect lens having only four refracting surfaces, such as a system composed of only two thick lenses. While it was quite possible that this limit would never be reached unless glass-makers succeeded in the future in producing glasses of altogether abnormal qualities, still systems with even five refracting surfaces, such as a cemented lens and a single lens, would be a considerable improvement on anything at present made. With respect to the question of increased usefulness, the subject of combination lenses naturally occurred. If each of the single combination of a doublet lens was to be corrected for spherical aberration, coma, and astigmatism, each combination could not have less than four refracting surfaces, either three lenses cemented together, or two lenses separated by an air space. The minimum number of refracting surfaces in such a doublet lens would therefore be eight, and consequently it could not be made very simple in construction. As a matter of fact, the only doublet lens of this nature at present constructed is the Zeiss-Satz Anastigmat, in which there are altogether five refracting surfaces in each lens, so that it appeared that an improvement in the direction of simplicity was still possible in the case of such lenses, and that there was no reason why lenses like the Goerz and the Voigtlander Collinear should not be perfected for each single component.

The PRESIDENT, in the course of a few remarks expressive of his high appreciation of the paper, said he thought the point as to the analogy between the spherical aberrations and the equilibrium of parallel forces was a particularly beautiful one.

The Rev. F. C. LAMBERT endorsed this view, and added that mathematical opticians would, no doubt, acknowledge that they were greatly indebted to Mr. Aldis for the manner in which he had brought forward this subject.

Mr. CHAPMAN JONES said it was encouraging to hear that there was a possibility of obtaining perfect lenses of simpler construction than those now available, for this would presumably bring with it a corresponding decrease in the present frightful cost of photographic objectives.

Mr. T. BOLAS referred to the researches of Goethe in connexion with optics, and to his suggestions as to the use of liquids instead of glass in the manufacture of lenses. Considering the very wide range of optical properties which could be secured by the use of liquids and mixtures, Mr. Bolas thought it might be worth while to follow up some of Goethe's suggestions in this direction.

Mr. W. P. DANDO asked whether there was such a thing as "effective aperture" of a lens, which would be greater than the *f* value of the stop employed.

Mr. ALDIS said the effective aperture was always greater than the absolute aperture as measured, except when the stop was placed in front of the entire combination of the lens. The purchaser must take the maker's word as to the effective aperture, or take the lens to some competent person for measurement, which was an operation beyond the powers of an amateur.

COMING EVENTS.

At the Technical Meeting, on June 26, Mr. J. H. Agar Burgh will read a paper entitled "The Selection of Lenses with regard to Photographic Perspective;" and the Rev. F. C. Lambert, M.A., will read a note on "How to Ascertain the Conjugates of a Lens without Calculation."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 7.—Mr. H. C. Rapson in the chair.

Mr. PHILIP EVERITT brought up one of the Beck-Steinheil convertible orthostigmat lenses for examination. The focal length of the lens was $5\frac{1}{2}$ inches, and it worked at $6\frac{1}{3}$, being intended for a 6×4 plate. Mr. Everitt showed it attached to a $7\frac{1}{2} \times 5$ camera, and invited an examination of its capabilities at full aperture, which he thought were quite satisfactory. Stopped down, it would cover a circle of about eleven inches. Speaking of its construction, he said each half was composed of a central positive meniscus lens, enclosed between a double convex in front and a double concave behind. The combinations can be used singly as perfectly corrected landscape lenses of about double the focal length and half the rapidity of the original. Commenting upon a remark about the curious method of marking the apertures which was thought to add to the weight of the lens, Mr. Everitt said that on the other hand the method of mounting the lens effected economy in the metal. It did not weigh more, in all, than the orthostigmat of Steinheil's own make; in other words, the size of the mount had been reduced without affecting the size of the lenses. The lenses were of particularly hard glass, and were very little affected by atmospheric conditions and changes. In another very popular lens the outside glasses were most liable to atmospheric changes, but in this the reverse was the case.

Mr. A. MACKIE had seen some first-rate lenses terribly rubbed, especially those of landscape photographers doing a considerable amount of business. From a selling point of view they were practically valueless.

Mr. T. E. FRESHWATER believed it was a fact that the internal surfaces of the combinations of lenses generally deteriorated quicker than the outer ones, perhaps owing to the fact that the outer surfaces were more frequently wiped than the inner surfaces.

Mr. EVERITT said that particular interest attached to this lens, inasmuch as Adolf Steinheil, the father of Rudolf Steinheil, was the man to whom the credit for first applying anastigmatic correction to lenses was due. The old antiplanet was corrected for astigmatism, as far as it could be with the old glass, on the same principles, one might say, as the anastigmat of Zeiss. He believed that the present lens was thought out in its construction by Adolf Steinheil, who turned over the details to his son to work out, and the first lens that he patented was of the Goerz type; but Goerz anticipated him by a few weeks, and his claim was opposed. Mr. Everitt ran through the record of Steinheil's achievements with the periscope, the rectilinear, and other lenses. The perisopic lens was still largely used in Germany for hand-camera work, and especially so for fixed-focus apparatus.

Mr. MACKIE criticised the method of numbering the apertures of the iris diaphragms of this and most lenses. In a dark interior, for instance, one wanted a match in order to read the numbers. If they could be fitted with a clicking device, they would be better; but he thought a good deal more of the wheel stop, for convenience, than the iris system.

Mr. W. D. WELFORD passed round a straight-edge vignette, for obtaining a graduated result in printing a negative without other shading devices. He also showed a carbon cloud negative in conjunction therewith, and a combination printing frame with movements for placing the negative at varying distances from the vignetting card, in order to secure different qualities of shading.

Mr. EVERITT showed photographs of the front and back of a violin varnished with red varnish. The detail of the wood, he pointed out, was visible right through the varnish to a marked degree. It received an hour's exposure at $1/14$ on a chromatic plate, without a screen, in an ordinary sitting-room.

Mr. MACKIE passed round a photograph of a phase of the recent solar eclipse, taken in a hand camera.

A discussion took place regarding the value of green glass for dark-room illumination.

The CHAIRMAN said that, not liking ruby light for orthochromatic work, he tried ruby and green, which, while perfectly safe, stopped practically all the illumination. He now used yellow light turned down until he could just see by it, but so little light was there, that if the diffusing yellow medium were removed he could see barely at all.

Mr. MACKIE said that Mr. Debenham's light was a canary medium or yellow-tinted paper, with a piece of what was known as "cathedral" green. The object of the green was not to make the light safer, but to approximate the light nearer to white light.

Gospel Oak Photographic Society.—June 5.—A demonstration on THE OPTICAL LANTERN

was given by the HON. TREASURER (Mr. J. E. Rayner), and it was again made manifest to the members that Mr. Rayner (as is his wont) had spared no time or effort in making the evening such a success as it was. The lecturer first dealt with the origin of the magic lantern, and then the use and abuse of the different optical parts. One strong point he emphasised was the use of suitable condensers for objectives of different foci, and also of using objectives with back lenses of large diameter to ensure flatness of field. The different illuminants were then dwelt with, beginning with the old-fashioned Argand lamp, which led up to the ordinary Fulgent and Stock's lamp. The lecturer then demonstrated with the incandescent gas-burner, but he stated that the light as seen on the screen was much less than one would expect owing to the fact that so many of the rays of light were lost; he considered, however, that the acetylene gas was a great improvement on the latter, and for small discs gave a beautiful light. Through the kindness of Mr. Tylor, 41, High-street, Aston, Birmingham, he was enabled to show them one of his Dreadnaught generators, which was a very compact apparatus. The more powerful lights the lecturer then dealt with, beginning with the ordinary blow-through oxy-hydrogen jet, showing the correct way of connecting up to the cylinder, and also the incorrect, which was demonstrated by the blowing off of the tubing. He now came to the more powerful light still of the mixed jets, which was produced by having both gases under pressure or by substituting the hydrogen cylinder for an ether saturator, and through the courtesy of Messrs. Willway & Sons, Bristol, he very successfully demonstrated the working of one of their No. 2 Gwyer jets with one of their Pendent saturators, and the light that was obtained was most searching and powerful.

FORTHCOMING EXHIBITIONS.

1900.

- July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.
 August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
 October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
 November 12-17 Ashton-under-Lyne.
 " 21-23 Hackney Photographic Society.

1901.
 January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

STEREOSCOPIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—You will greatly oblige if you can give me some information on stereoscopic photography. Having been an ardent amateur for twenty years, I have lately taken up this most interesting branch. I have an old stereoscope by Mayall, but fail to get the images from transparencies good unless the centres are under $2\frac{1}{2}$ inches. Now, I notice in the modern prints anything from 3 inches up to $3\frac{1}{2}$ inches seems to stand out perfectly viewed through the cheap stereoscopes of, say, 2s. 6d. to 6d. each. I am trying to buy an old box stereoscope as the best form. As I may say, I have read all the fine articles in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, but, unfortunately the reading makes me feel sick, as it is now quite impossible to buy the fine stereoscopes named therein, more especially the one, I think, by Sir H. Grubb, which was arranged by means of prisms reflected on to a mirror.

The point I am anxious to know is this: I am using an 8×5 camera, a pair of Ross's 5×4 R.R. lenses. If I take negatives at, say, $3\frac{1}{2}$ centres,

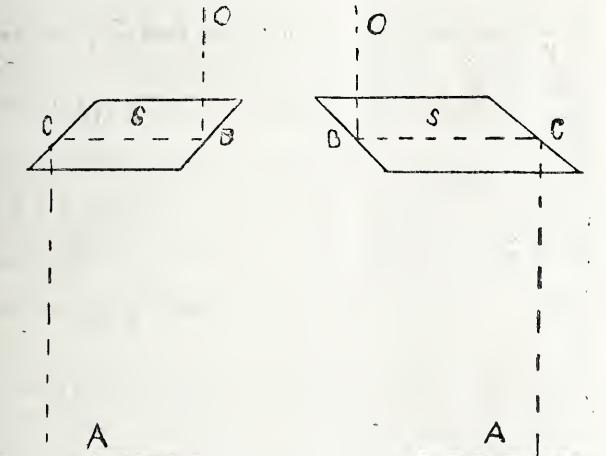
on putting them into the reducing camera the correct way the centres will then be, say, $4\frac{1}{4}$ to $4\frac{1}{2}$. Now, to reduce 8×5 to, say, $3\frac{1}{4} \times 6\frac{1}{2}$, I can get centres of $2\frac{3}{4}$ or more, according to the reduction, and how much of the original negative I wish to take in. The main points I wish to trouble you about are for a box stereoscope I purpose getting (when I can come across one are : (1) What centres should I make the transparencies ? (2) Is this the best class of stereoscope to get ? (3) Is it possible to obtain the other form I mention ? I have seen your answer some months back to an inquirer, that this form is not made now. (4) Is there any means of viewing transparencies on 8×5 plates ? I ask this latter question because all the old books say $2\frac{3}{4}$ centres, yet in the modern prints I notice the centres are far exceeded, and yet the picture stands out, to me, far better.

If you are not very much troubled with this long letter, I will be very much obliged for a reply in your very valuable paper. I am, yours, &c.,

E. L. JOHNSON, JUN.

23, Bergholt-crescent, Stamford Hill, N.

[In reply : Box form stereoscopes—by which we presume our correspondent means the kind of instrument introduced by the late Sir David Brewster—are not uncommon. Recently we saw some of modern make at Messrs. Watson & Sons', 313, High Holborn, W.C. As regards the questions : (1) Let the foreground centres be under 3 inches, say $2\frac{3}{4}$ or $2\frac{7}{8}$ inches. (2) Personally we prefer the Chadwick stereoscope described in the article mentioned. (3) We are sorry to say not. (4) Perhaps our correspondent's eyes have an abnormal width of separation. Binocular transparencies on 8×5 plates or at a "greater distance of separation" may be viewed in the following manner : Look at the pictures through reflecting prisms as shown in the drawing, in which *a* and *a* are the eyes of the observer,



situated two and a half inches apart. *a a* are the large pictures mounted side by side on a card, *s s* are oblong square blocks of glass, polished on top and bottom, and having the ends, *b* and *c*, ground to an angle of forty-five degrees. The length of each glass block, or, in other words, the distance between the reflecting surfaces, *b* and *c*, determines the distance between the centres of the pair of large pictures. As *b* and *c* are merely reflectors, four small mirrors mounted at the same angle will serve instead of the more expensive and more difficult-to-be-obtained mirrors. Apertures are cut in each tube, one above to enable the eye to see the reflector nearest to it, and the others below to permit of the transmission of the light from the picture not to be interfered with. The construction of this piece of apparatus is so simple as to be within the scope of every one, even if he were devoid of all mechanical skill. Sir Howard Grubb is the inventor of this application of prisms for practically widening the distance between the eyes.—EDS.]

ORTOL IN INDIA.

To the Editors.

GENTLEMEN,—The gentleman who thought I was "trying to be funny" seems to have been himself guilty of posing as an authority on the strength of a mere guess. A nice, cheap way of obtaining renown—when it comes off ! It is a dangerous thing to attempt with persons who were, perhaps, making their own early dry plates when you were in the cradle. It struck me as decidedly curious if a developer, alleged to be excellent in two solutions, should be incapable of being made in one solution. I am not accustomed to find so much self-will and obstinacy among my chemicals. To set aside all doubts as to the accuracy of the reason alleged by my instructor, I have tried the two-solution formula with potash given in the ALMANAC, and find very similar results. The reason given and underlined by my excellent mentor is thus shown to be credit-

able to his imagination. As a matter of fact, unless I buy a dozen bottles at a dozen different shops, I have no means of knowing whether the ortol sold to me is good or bad. I suspect the latter. It certainly smells of dead animals, and it certainly is of a slate colour. Nevertheless, I can make good negatives with it. It gives more density and hardness than metol, and there its superiority (if superiority it be) comes, in my opinion, to an end.

TIPPOO.

A LOST COOKE LENS.

To the Editors.

GENTLEMEN,—On April 3 last a lens which was being sent to us from London was apparently stolen in the post. It was a Cooke lens, Series III., of about five inches equivalent focus, and was numbered 5058. May we ask your kind assistance in making this loss known to your readers, with the view of our recovering the lens, if possible? It was not an ordinary lens, and we would give a reward of 5*l.* for such information as may lead to its recovery.—We are, yours, &c.,

TAYLOR, TAYLOR, & HOBSON.

Stoughton-street Works, Leicester, June 7, 1900.

TELLA CAMERA DEMONSTRATIONS.

To the Editors.

GENTLEMEN,—We should esteem it a favour if you would allow us to notify the secretaries of photographic societies that we are ready to fill up dates for lectures and demonstrations on the Tella Camera.

The lecture will be made as interesting as possible with the help of glass models of the various parts of the camera, and also by lantern slides.

Early application is requested, as many dates are already filled.—We are, yours, &c.,

THE TELLA CAMERA COMPANY, LIMITED.

W.M. E. DUNMORE, Secretary.

110, Shaftesbury-avenue, W., June 8, 1900.

THE NEWCASTLE CONVENTION.

To the Editors.

GENTLEMEN,—When I left England, seven months ago, I quite expected I should be back in time to attend the Convention. There is now no chance of this, and, though the war is evidently in the last stage, it is quite impossible to say when the troops will commence to leave the country. Those belonging to my branch of the service will certainly not be amongst the first to get home, as after the campaign there will be a good deal of financial work to be dealt with. I was looking forward to the meeting at Newcastle, which, under your presidency, is bound to be a big success.

I came here shortly after the occupation, and it is possible I may move on to Pretoria, but I have no orders as yet. Of photography I have done very little. My department is rather short-handed, consequently there is no time for play.

I have not got Mr. Bridge's address by me, so will you kindly hand him my subscription, which I enclose. I am, yours, &c.,

Bloemfontein, May 18, 1900.

J. D. LYSAHT.

[Although addressed to us in a private capacity, we have printed Colonel Lysaght's letter because we are sure that his many photographic friends in all parts of the country will be delighted to have good news of him from the seat of war. Though absent from the Convention at Newcastle, he is not likely to be forgotten there.—EDS.]

PHOTOGRAPHING AT THE PARIS EXHIBITION.

To the Editors.

GENTLEMEN,—In answer to Mr. A. L. Henderson in your last number of THE BRITISH JOURNAL OF PHOTOGRAPHY I would say that I do not think many amateur photographers have fared as bad as he has. This does not mean to say that all is perfect in regard to permission as to photographing at the Exhibition of Paris. Prices are much too high not only for one day, but also for the whole season, and even with a permit you are continually bothered by officials in uniform as well as in plain dress, asking for your permit. One thing I must however, add to your information, and that is that one day's permits are now good from 8 a.m. to 6 p.m., except on Sundays and holidays when they are only good till 1 p.m., and of course provided always you do not interfere with the circulation. This new rule dates from the 6th inst.

ALBERT LÉVY.

Asnières (Seine), June 10, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:

W. West, 74, Oxford-road, Windsor.—Photograph of drummers of 1st Grenadiers.

KINOS.—The use of the substance for the purpose named has been patented. We offer no opinion as to the validity of the patent.

ADDRESS WANTED.—W. W. asks for the address of the makers of the Aptus Magazine Hand Camera.—In reply: Messrs. Sharp & Hitchmough, Dale-street, Liverpool.

FRENCH PHOTOGRAPHIC PAPERS.—NEMRAC writes: "Could you give me the names of one or two French photographic papers of widest circulation?"—In reply: *Bulletin de la Société Française de Photographie*, and *Moniteur de la Photographie*, published at 55, Quai des Grands Augustins, Paris.

PAINT FOR STUDIO.—B. ROLLS. What is the best colour with which to paint the inside of the studio?"—Any light tint, according to taste, will do, but the colour should not be very pronounced. A neutral tint, or a French grey, is very suitable. If the walls are papered, use a light paper with a nice quiet pattern upon it.

EMULSION WASHING.—BROMIDE asks: "How long will it take to wash bromide emulsion, squeezing once through this canvas (sample sent)?"—It must, of course, depend upon the amount of emulsion to be washed, and the quantity of water in which it is washed, as well as the attention it receives while washing. No definite time can be given.

POISONS ACT.—& Co. say: "We are supplying an intensifier that contains bichloride of mercury. We are not labelling the bottles 'poison' at present. Is it necessary to do so to comply with the Poisons Act?"—Yes, it is. If you are not pharmaceutical chemists, you are not qualified to sell bichloride of mercury at all, whether labelled "poison" or not.

A PHOTOGRAPHERS' TRADE UNION.—E. F. SANDERS writes: "Will you please let me have the address of the Secretary of the Photographers' Trade Union, so I may know it for future reference?"—In reply: No such Union is in existence. There is the Photographic Copyright Union, of which the Secretary and offices are Henry Gower, London Chamber of Commerce, Botolph House, Eastcheap, London, E.C.

FIRE INSURANCE.—CHARLES STUART writes: "Some little time ago you mentioned in your columns one or two very reasonable insurance companies for photographers to insure their goods and apparatus at small premiums. I should be greatly obliged if you would be good enough to inform me, through your columns, a company you could advise."—In reply: The Westminster Fire Office, King-street, Covent Garden, W.C.

STUDIO ROOFS.—J. W. writes: "I shall be glad if you will kindly inform me what is best to use on glass of studio to keep rays of sun out. I have found white tissue-paper turn yellow after a short time, and am afraid white paint could not be removed in winter."—Make up some thin starch or flour paste, and then mix with it some ordinary whitening. Stipple that on the glass to be obscured. It can easily be washed off as the winter approaches. It is easily applied and easily removed.

ECLIPSE PHOTOGRAPHS.—ASTRO sends us six photographs of the late eclipse of the sun, taken with the front lens of a R.R. of eighteen inches focus, equal to a lens of about thirty-six inches focus, and asks why the image appears in the negative transparent instead of opaque. He says that the plates were the Imperial, and backed with the backing given in the ALMANAC.—The reason is that the action of the light has been reversed by great over-exposure. We have received several examples due to the same cause.

PAYMENT FOR BANK HOLIDAY.—ASSISTANT writes: "Our employer tells us that he shall deduct our wages for the Bank Holiday, though the place was not open. Can he legally do so, or could we not recover the day's pay to be deducted in the County Court?"—Whit Monday being a legal Bank Holiday, we imagine you could; but it may be a question of policy on your part as to whether it would be wise to invoke the law, as your employer can discharge you at a week's notice if he likes. Any how, it is very mean on his part to attempt to make the deduction, and, what is more, it is very discreditable to him to do so.

TWENTY-EIGHT PICTURES ON ONE PLATE.—REPEATING BACK writes: "I have a repeating back for camera in use of American make, for taking twenty-eight midgets on half-plate, and I see by the way the photographs are printed it repeats down or up, not long way, as usual. If you could give me any information, or how I could obtain one, I should consider it a great favour. Of course there is only one lens used and twenty-eight different exposures."—In reply: Our correspondent's question was evidently suggested by a reproduced photograph recently published in an illustrated magazine. We have looked through our American exchanges, but can find no reference to such a repeating back. Perhaps, if our correspondent communicates with his dealer, the latter may be able to obtain it of one of the American stock houses.

COLD VARNISH.—R. PALMER asks: "Can you tell me how to make a varnish that can be applied cold, such as I have seen used for glass positives?"—Make a tolerably thick solution of dammar resin in benzole; then, when settled, decant and thin with benzole to the fluidity desired.

ECLIPSE PHOTOGRAPHY.—OBSERVER writes: "I am enclosing you four photographs I took of the eclipse. 1 and 2 in the ordinary way; No. 2, having trifle longer exposure, does not appear sharp on account of halation, as in negative double image is clear. No. 3, on same make plate, but taken through an ordinary piece of yellow glass, same exposure as 1, 2. No. 4 without yellow glass, and mainly taken to show clouds. I send these principally to ask how it is the sun appears black in 1 and 2, but white in 3 and 4, though 1, 3, and 4 are the same exposures, and on same plates."—Nos. 1 and 2 are very much over-exposed, hence there is a reversed action of light. In No. 3 the yellow glass has cut off a great deal of the actinic light, and so the image is normal. In No. 4 the exposure has been shorter, and the sun was partially obscured by clouds, and so the sun, as in No. 3, appears normal.

BUBBLES ON BROMIDE PRINTS.—PHANTOM writes: "I have toned a bromide print to sepia in the hot hypo alum bath and the tone is perfect. Upon washing, however, the whole surface became covered with minute bubbles—millions of them everywhere. Thinking that cold water caused them, I toned another and rinsed with water same temperature as bath, but the same result. I have now made another, but am afraid to wash it, as, by testing a corner, I find it is prepared to act in the same way. Can you tell me what is the cause, and what I am to do? I have followed the instructions carefully, and have never had such a case before?"—The only suggestion we can offer is, that there is something in the water that causes the bubbles—probably a carbonate of lime. However, if the bubbles are removed by a flat camel's hair brush immediately the prints are put into the water, no evil will result, we imagine.

CHOICE OF STUDIO, &c.—THE MAJOR writes: "Kindly let me know your opinion on the sketches of studio, which you think is the most suitable for all-round work, light only obtainable from east. The first is Mr. H. P. Robinson's idea, second Mr. Inglis's (American), third Mr. Dnchochos' (French, I believe). Each of above studios is considered (by the writers of the instruction books) to be the best. Also, please let me know if over-printed P.O.P. is quite permanent if slightly reduced with ferrocyanide of potassium and hypo, the same as used for negative reduction."—There is really no best. All are good, and it is a mere matter of fancy of the individual worker. More depends upon him than the form of the studio or its aspect. With regard to the permanence of reduced prints, we can, from experience, scarcely hazard an opinion, for, in our own practice, when we have any over-printed prints, we destroy them and make others, as we find it less trouble. However, we do not see why reduced prints, by this process, should be less permanent.

LENS QUERIES.—SHUTTER writes: "Please enlighten me in the following: 1. If on a half-plate I use an eight-inch focus R.R. lens covering well the $6\frac{1}{2} \times 4\frac{3}{4}$ at full aperture f-8, and immediately after use on the same sized camera a nine-inch focus R.R. of equal quality covering well a $7\frac{1}{2} \times 5$ at full aperture f-8, ought I not, when employing the longer focus R.R., to allow for the greater light it admits at f-8, and so make the exposure calculations as though its largest aperture were f-7, if working at full aperture? 2. Should you consider that to use a good nine-inch focus R.R. covering well at f-8 a $7\frac{1}{2} \times 5$ plate would, if used on a half-plate camera, enable me to do instantaneous work under practically any atmospheric conditions; or when a stigmatic lens, working at f-6, is not available, would you recommend for general work (not interiors) for a half-plate the R.R. to be of longer focus than nine inches, and cover well a 8×5 plate at its full aperture f-8? 3. Is the roller-blind type of shutter or the one working between the combinations the better, and why?"—1. No. If both lenses have an aperture of f-8, the one will be no quicker than the other. 2. All things being equal, the longer-focus lenses will cover the plate the better with a given size aperture. The shorter the focus of the lens the smaller the stop required to cover the plate to its edges. 3. In practice the one is as good as the other.

A BEGINNER'S QUERIES.—H. A. H. writes: "I see by your ALMANAC (which I have found useful) that you are pleased to answer questions on photography. Would you be so kind as to answer me the following? 1. What photographic apparatus do you recommend for cycling? I want one light, good, and not expensive; I should think one that could be carried across the back would be a nice place. 2. Do you recommend plates or films? It seems to me the latter are lighter and more convenient for two or three weeks' cycle touring. What are the pros and cons concerning plates and films? I carry my luggage on cycle when touring, so have not much room for, say, twenty plates. 3. How much more in cost would films be over plates, and are they much more trouble? 4. Could I have an apparatus so as to use either, say, plates at home, films while cycling? 5. Do you recommend a quarter or half-plate? A quarter would be lighter, but I understand that half makes the best pictures, giving more detail (sic), and that, when I got into photography, I should want a half-plate. 6. Could I have an apparatus to use half-plates and quarter films? 7. Do you recommend a rectigraph lens, or what lens? I want a good one."—In reply: 1. If our correspondent will glance through the advertisement pages of the ALMANAC which he possesses, he will find innumerable cameras described which are suitable for cycling. 2. Both yield equally good results, but films save a great deal of weight. 3. See the makers' advertisements for prices; films are really no more trouble than plates. 4. Yes; slides and sheaths are made to take both. 5. For your purpose a quarter-plate. Size is a matter of personal predilection. 6. Yes; half-plate carriers to take quarter-plate films would have to be specially made. 7. The lens mentioned should answer your purpose.

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EX CATHEDRÂ.

MR. R. W. CRAIGIE, the courteous Honorary Secretary of the Photographic Salon, gently reminds us that "summer is fleet" by sending us a proof of the entry form and prospectus of next autumn's Exhibition of the Salon—the eighth of the series. As usual, the Dudley Gallery of the Egyptian Hall, Piccadilly, will be the scene of the Exhibition, which will be open from September 21 to November 3. A comparison of dates shows that the Salon will be opened more than a week earlier than the Royal Exhibition at the New Gallery. Both, however, close on the same date, November 3. The prospectus does not appear to have made any change in the conditions of entry previously adopted. The receiving day is Monday, September 10, from 10 a.m. to 6 p.m., on which day all pictures for exhibition must be delivered at the gallery. We note that sixty-five names are included in the list of the General Committee, but many of the gentlemen have done nothing in exhibition work for years, and the names of others are not so familiar in photography as they might be. A little "new blood" on the General

Committee would give the list of names a less mysterious aspect. We mention this matter in the interest of would-be exhibitors, who, no doubt, would prefer to submit their work for selection at the hands of a body of photographers in touch with modern movements. At least twenty-two of the General Committee are foreigners, or live abroad; and, to our knowledge, seven or eight of the remainder have practically given up "pictorial photography" altogether. Roughly, one-half the General Committee has only a nominal connexion with photography. We are drawing attention to this matter because, as a general appeal is made to outside exhibitors, the latter have a right to know not only the composition of the General Committee, but their qualifications to sit in judgment on modern pictorial work. Assuredly absenteeism or indifference on the part of thirty or forty out of a Committee of sixty-five is a qualification of a very negative kind indeed.

* * *

THE Illinois College of Photography, of which we wrote last week, is in process of enlargement. The corner-stone of a new wing has been laid, and that mighty organ of the Press, the *Effingham Democrat*, tells us that five thousand people from home and abroad assembled to "witness the beautiful ceremony and to hear the splendid oration. The intelligence and beauty of the country gave an unprecedented charm to a deserving occasion. Had it not been for the heavy rain of the forenoon and the threatening weather of the afternoon, the attendance would have been 10,000. It was great, however, any way. The Illinois College of Photography is the pride of Effingham." The reporter adds that "the Kodak fiend was on hand, and reaped a rich harvest. Innumerable views of the parade and of the scenes at the grounds were taken. The parade was one of the finest ever witnessed in the city." After various ceremonies the corner-stone was laid, its contents including boxes of various brands of American dry plates; Velox, platinum, carbon, gelatino-chloride, and other prints; copies of local newspapers and copies of twenty-seven American photographic publications. A learned Judge then delivered a very long oration on nothing in particular, and a characteristically American ceremony came to an end. It is the first photographic foundation-stone-laying that we remember to have

read of. In future ages the condition of those boxed sensitive plates and the prints will be interesting to see. We take leave of the Illinois College with the remark that if, after all these ceremonies and extensions, it does not turn out large numbers of the most competent photographers, we shall be disappointed in it.

* * *

WE are asked to give publicity to a special offer to the photographers of the United Kingdom, which is made by the Ohio-Michigan Photographers' Association in connexion with its first Annual Convention, to be held August 21-23, at the Hotel Victory, Put-in-Bay, Ohio. In the prospectus that has been sent us we perceive that a special prize, open to the world, has been scheduled. For this competition two pictures, with no restrictions as to size, must be sent, and, as the prospectus says nothing on that point, it is to be supposed that the subjects of the pictures may be either portraiture or landscape at the discretion of the exhibitor, although the former might, we suggest, be given the preference. The prizes are: first, fifty dollars in gold; second, gold medal; third, silver medal. Mr. A. L. Bowersox, the Secretary, whose address is Dayton, Ohio, writes that his Association desires to extend to the photographers of the United Kingdom the privilege of competing free of charge. Exhibits must be delivered to him not later than August 15, carriage paid. A copy of the rules has been sent to us, and we append those which are applicable to the cases of those photographers who may care to compete for the prizes offered. All pictures, whether in competition or not, are eligible to the salon. Those chosen for the same will be suitably framed at the expense of the Association. Exhibits for prizes will be judged by consultation and comparison by non-competing photographers of known ability. Pictures for the salon will be selected by art judges.

* * *

OUR contemporary and neighbour, the *King*, whose reproductions of Mr. H. C. Shelley's war photographs have been so much appreciated by the public during the past six months, announces that arrangements have been made by which copies of the photographs taken during the war by Mr. Shelley may be secured at a price to cover the mere cost of material and labour. For any of Mr. Shelley's photographs, as published in the *King*, except for those specified below, 1s. per print (unmounted) and 1s. 6d. per print (mounted) will be charged. The average size of the prints is whole-plate. The now celebrated photograph of *Lord Roberts in Khaki*, with autograph attached, which was reproduced as a supplement in the issue of April 28, will be supplied, mounted only (size $19\frac{1}{2} \times 11\frac{1}{2}$ inches), for 2s. 6d. For the picture of *Lord Roberts and his Staff*, which appeared in the issue of April 28, the following prices will be charged: Unmounted prints (size $8\frac{1}{2} \times 6\frac{1}{2}$ inches), each 2s.; mounted prints (size 13×11 inches), each 2s. 6d. For the photograph entitled, *Lord Herbert Scott Hoisting the Flag at Bloemfontein*, as published in the issue of April 21, the following prices will be charged: Unmounted prints (size 12×10 inches), each 2s.; mounted prints (17×15 inches), each 2s. 6d.; postage, 3d. All communications relating to these photographs must be addressed to the Manager, Print Department, the *King* offices, 7, Catharine-street, Strand, W.C., London. These photographs will one day possess a very high historical value, and we have great pleasure in giving publicity to the fact that copies of them are obtainable.

ABOUT PHOTOGRAPHIC PATENTS.

ON two or three occasions lately we have called attention to some proposed reforms at the Patent Office. One of these is that the Office should control or limit the issue of patents for inventions that are "obviously old," and which have been previously patented in this country. It would seem, however, according to the instructions issued to the Committee of Inquiry on the subject, that it is to be restricted to the records of previous patents, and will not extend to what has been published outside the Patent Office. Hence patentees will still have to rely upon themselves as to whether their inventions have been anticipated or not unless they happen to have previously formed the subject of patents. This will be their business as heretofore.

Many photographic inventions in late years have formed the subject of patents that were fully published and used decades previously, as may be seen by reference to the early volumes of this JOURNAL, yet they have proved profitable to their inventors, though they were obviously invalid. For example, in the late Victorian Exhibition at the Crystal Palace was a turn-table in the baseboard of a camera that was made and used in 1854, but it did not then form the subject of a patent. Here is another. One of the first roller slides was that of Captain Barr, and it was used with daylight spools. The sensitive paper—"wax paper"—was fixed to black calico longer than the paper itself, so that several layers of it covered the paper at each end, thus enabling the spools to be changed in full daylight. This invention, like the one just referred to, was not patented, but it was fully described in *Notes and Queries* early in 1855. Of course, the Patent Office reforms would not apply in such cases as these and many other instances of prior publication.

At times a patentee does instruct his patent agent to make a search as to the originality or otherwise of his invention, but then the search rarely extends beyond the records of the Patent Office. Sometimes, however, the agent goes further, and consults an expert in photography, if the subject be a photographic one, as to what has been done or published before, so as to ensure his client a valid patent, or avoid getting him an invalid one, though that is not often done.

Here is an important point in connexion with photographic patents that does not seem to occur to many inventors, who, directly they make an invention, or an improvement, or even an alteration upon an old one, forthwith obtain a patent for it without even considering whether it has any commercial value. Every inventor is entitled to profit by his invention if he can, but innumerable patents have been and are being taken out in connexion with photography that never have brought, or never will bring, back the cost of the patents. There is obviously no use whatever in going to the expense of a patent for any process or appliance which is not required or ever likely to be adopted, yet this is continually being done by sanguine inventors. It is interesting to note the proportion of the photographic patents that are kept up after the fourth year by the payment of the renewal fees. It is a very small proportion indeed, and that shows conclusively that they have not proved remunerative, or they would not have been allowed to lapse.

There is another point in connexion with the taking out of a patent that may often render it invalid, if it were contested. It is this: Many photographic patentees take out their own patents, and make claims in them that cannot be sustained in a case of infringement, by reason of anticipation, though others

may be perfectly good, or the claims may be wrongly expressed. According to the present patent law, if one single claim out of several is bad, the whole patent becomes void. If the specifications were drawn out by an experienced patent agent, although part of the invention might be old, a valid patent might be secured. In such a case the agent will make reference to what has been done before, and not make any claim for that portion of the invention, but only for those parts which are actually novel. A patent agent, in the interest of his client, always reduces the claims in an English patent to the smallest possible number, but takes care that they cover all the important features of the invention; whereas the layman will often insert a large number of claims of no importance, which may weaken or void the patent if it ever have to be litigated. An old aphorism says, "The man who acts as his own lawyer usually has a fool for a client." This often applies to a patentee who acts as his own patent agent when he has a really valuable invention to protect.

In a case of infringement some patentees go at once to their solicitor. Now, as a matter of fact, the ordinary solicitor knows as much about patent-law practice as the man in the street. It is far better to consult a respectable patent agent who has the patent laws at his finger ends, and can give really practical advice in the matter offhand.

A useful hint might be borne in mind as to the advisability of taking patents for improvements in photography. In some instances it would pay the inventor better to deal with his invention as a "secret process," inasmuch as he may never be able to prove an infringement if a patent for it were infringed. Although he may see the results, and practically know they were produced by his patented process, he may yet be unable to prove that they were actually done by it to the satisfaction of a court of law.

Star Photography with an Ordinary Camera.—Under this title there will be found, in the *English Mechanic* for the 8th inst., a copiously illustrated article of the greatest interest. The writer, Mr. Barker North, A.R.C.Sc., F.C.S., details his experience, and illustrates it with explanatory photographs and star maps. The only apparatus used was an ordinary half-plate camera fitted with an eight-and-a-half-inch focus rectilinear lens. Every one is familiar with the fact that the sun appears to go round the earth, and that the stars apparently are subject to a somewhat similar revolution, although, to those unfamiliar with astronomical facts, it does not seem to be generally understood why, if the sun at any given time—say noon—is always nearly due south, the stars are subject to no such rule. We need not pause to explain that simple phenomenon, but will point out that the whole starry vault revolves (in appearance), the centre, or axis, of revolution being almost exactly the pole star, high overhead. This star therefore appears stationary, and never sets; the stars near it revolve in small circles, and the further away the larger the circle, till a point is reached where the circles cut into the horizon, and thus disappear for a time and rise and set. It follows therefore that, if a camera be pointed at the pole star, and several hours' exposure given, it would come out as a point or dot on the plate, but the stars removed from it, as they would be moving, would leave parts of circles of light; with exposures of a few minutes only, the portions of circles of the circumpolar stars would be so small as still to be almost points, while those more distant from the pole would have travelled sufficiently to impress themselves as a visible line—in other words, as a star trail. Of course, a camera could not embrace the whole heavens at once, so that, when a particular constellation was to be taken, the camera should be directed to it, making its centre the centre of the plate. The whole constellation would then be reproduced, and would be

capable of being used as a lantern slide of most instructive character. Mr. North points out that, for the particular purpose in question, a short-focus lens is better than a long one, as the "trail" would be shorter, and so a faint star would have a better chance of impressing itself. He would, indeed, recommend a four-inch in preference to an eight, and we would point out that one of the modern flat-field, non-astigmatic lenses would be decidedly preferable to a rectilinear, with its curved field and want of sharpness at the edge of an extended field. Another point is that plates of great sensitiveness should be employed. Mr. North reminds us that the tripod should be firmly fixed, as for some stars the camera would have to be tilted very considerably, and would thus be liable to be upset or readily moved unless the tripod legs were well pushed into the ground. "Amateurs," he says, "should receive encouragement to take up this branch of photography from the discovery of Dr. Thomas Anderson, of Edinburgh," who with the simplest apparatus made the discovery of a new star, and communicated with the Astronomer Royal of Scotland, who verified the discovery, and particulars of it were soon flashed to observatories all over the world. "Amateurs may therefore dispose of the idea that only those possessing a telescope and driving clock have the means of securing star photographs which are of any value, as it will be seen that much can be done with very ordinary apparatus; and, once the worker has secured fairly successful results, he will find a peculiar fascination, which is not easily discarded, in this branch of photography."

Radio-activity of Uranium.—Continuing our description of Sir W. Crookes' experiments on this subject, we may say he finally, by his method of repeated precipitation and fractionation of "pure" nitrate of uranium, separated a body to which he gives the provisional designation of UrX, which is capable of acting upon plates after five minutes' exposure, and giving as much density as twenty-four hours' exposure to the original uranium salt, this action being capable of passing through glass, celluloid, and aluminium. He sums up his views on the possibility of these new elements of the Curies as follows: "In the present state of our knowledge of these radio-active bodies it is safest to retain an open, or even a slightly sceptical, mind. We recognise them mainly by the electrical and the photographic tests—reactions which are so sensitive that they give strong results even when the body is present in too small a quantity to be detected by its spectrum. . . . Considering my most active UrX does not contain sufficient of the real material to show in the spectrograph, yet is powerful enough to give a good impression on a photographic plate in five minutes, what must be its dilution in components which require an hour, a day, or a week, to give an action?"

JOTTINGS.

So many photographers "skip" the optical parts of photographic periodicals, that I need not apologise for directing attention to the report of an important paper on the construction of photographic objectives, which is printed at page 381 of the JOURNAL for last week. The author, Mr. H. L. Aldis, B.A., is one of the few—the very few—English mathematical opticians of the first rank, and his remarks point to the probability of something like a revolution in lens construction. Modern photographic objectives often consist of four, five, six, eight, and ten glasses with a proportionate number of refracting surfaces, but Mr. Aldis holds out the hope that much greater simplicity of construction is possible. It must surprise and interest non-mathematical photographers, who have thought or believed that the limits of lens correction and construction had been reached, to be assured that given glasses of refractive and dispersive powers such as are not to be found in the Jena catalogue, a perfect lens system composed of only two thick glasses—four refracting surfaces—is possible, and that even without glasses, which would conduce to the achievement of such an optical *tour de force*, a perfectly corrected lens with only five refracting surfaces, a single glass and a

cemented lens, is, as Mr. Aldis hints, quite feasible. The major portion of the paper, as may be inferred, appeals to the mathematical optician but lens-makers will, no doubt, greatly appreciate that part of it which gives hope that the niceties of production and adjustment which many modern anastigmats necessitate will one day be greatly simplified, while photographers will surely look forward to the time when first-class lenses are less costly than they are at present. Other parts of Mr. Aldis's valuable paper will bear careful consideration by photographers using "modern" lenses.

I HAD NO IDEA of the extent to which racecourse photography is practised until the day of the Gold Cup, at Ascot, last week. The Royal, and other enclosures, thronged with elegant ladies brightly dressed and looking just as pretty as flower gardens; the roaring crowds of horse-worshippers; the scurrying quadrupeds, urged on by pale-faced mannikins in parti-coloured coats; the mellow beauties of the Royal Heath itself—these things are annually described with mechanical regularity in the daily newspapers, and can have no interest for seriously minded people, such as the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY very properly are. Lest any of them should be inclined to raise their eyebrows at my confession of having passed a June afternoon contemplating half a dozen horse races, which are satirically alleged to be held for the purpose of improving the British thoroughbred, I may explain that curiosity as to what Royal Ascot was like as a spectacle was the principal inducement for me to go there. In the second place, Ascot lies within cannon-shot distance of my humble abode, and, as early-closing enthusiasm breaks out once a week in our village, I am forced occasionally to participate in it. Fourteen years have passed since the holiday fever directed—or misdirected, if you will—my footsteps towards a racecourse, Newmarket, to wit; and I shall be quite satisfied if an even longer period elapses before I again take part in these Isthmian games. Human nature reveals some of its worst aspects at race meetings, and no thoughtful man can see what goes on there without having his peace and happiness of mind rudely struck at.

BUT to photography. I counted scores of hand-cameras on Ascot Heath, and two or three stand photographers were busily engaged in exposing on the crowds; the aristocratic enclosures; the finishes of the races; and the incidental life and character of the motley horde of racecourse *habitues*. What struck me as worthy of note was that the hilarious turf-goers took the little army of photographers quite as a matter of course. They did not object to be snap-shotted, and you heard no ribald references to "infernal machines," "just as you are for ninepence," and so on, such as a few years ago were extremely common. The photographer nowadays appears to be recognised as a man and a brother, no matter where he goes. I was much interested at seeing the working of the "starting gate" at Ascot. The horses are marshalled behind a rope stretching across the course, and when they are in line the starter pulls a lever, up goes the rope, and the wild flight for the winning post begins. But horses are like women, "sweetly alike and yet unalike"—you can't drill them, or make them work together in harness. I fancy that, if each time Mr. Arthur Coventry, the official starter of the Jockey Club, pulls the lever of his starting gate he made a photograph of the start, he would realise that the instances whereby the animals all got off together were very few—especially in two year-old races. I dare say the delightful horses of which Dean Swift wrote, could have toed the mark had they been set the task, but racing colts and fillies are not endowed with the philosophic calmness of the animals so charmingly described in *Gulliver*. A photographer, or anybody else, awaiting the start of a two year-old race, need be a very patient individual indeed.

POOR "Warren of Leeds," as we had grown to call him, passed away with shocking suddenness last week. It is only a month since we accidentally met in London, and our last words were on the subject of the Newcastle Convention, at which he intended being present. I first saw him on the occasion of the Leeds Exhibition five years ago. He was a many-sided man, whose future place in

the army of workers it was too early to prophesy about at the time of his lamentably early death. Clever, thorough, and sometimes brilliant as he was in his photographic efforts, it never struck me that, as the years went on, he would be content to move in a circle, as those who take up pictorial photography necessarily must. His restless spirit craved for the opportunity of doing greater work than this, and of all his gifts that of the pen seemed to me to be one which would one day bring him the satisfaction of success which every brain worker craves for. His writings were graceful, witty, and fanciful. He was a hard worker and had crowded a great deal into his all too short life. One of his last letters to me was about the beauties of the upper Thames in June, within sight of which I am writing these lines. In offering his widow and the members of his family my sincere sympathy in their loss, I am conscious of being one of a very wide circle indeed of poor Warren's friends and acquaintances.

IT WAS NOTICEABLE that, so soon as Mafeking was relieved, the purse-strings of the patriotic and the charitable were tightened, and contributions to the various War Funds became fewer and smaller than in the dark days before the surrender of Mr. Cronje. Again, ever since Lord Roberts occupied Johannesburg most people have looked upon the war as being virtually over. These and other circumstances will explain why the War Fund started by this JOURNAL did not reach a larger sum than 1840 shillings. Besides, photographers all over the country have helped to increase locally raised funds; and in these hard times one has to be circumspect even in almsgiving. From a recent copy of the Edinburgh *Scotsman* I notice that on the occasion of the passage of a celebratory procession through the incomparable Princes-street of the entrancing city which the railway has not succeeded in spoiling, Mr. W. Crooke raised the goodly sum of 50/- by letting seats in his windows to sightseers. Well done! At ordinary times the view from Mr. Crooke's window towards Edinburgh Castle is impressive; but, with a procession in the foreground, those who paid for seats had double their money's worth. There are several "war carnivals" about to be held in and about London; perhaps this note will induce the photographers on the lines of route to follow Mr. Crooke's excellent example, and let their windows for the benefit of the Fund.

SOME OF the American photographic publications supply funny reading matter just now. It is all over pictorial photography. A few ladies and gentlemen in New York are industriously boozing themselves and their work, which may best be described as of that kind which a professional photographer would consign to his waste tub, whilst the public and the common-sense critics would not have it at any price. These self-deluded, if well-meaning, people claim the leadership of pictorial photography in America, on the grounds of the unrecognisable smudginess of their work and the slobbery stuff, styled "appreciations," that is written about it. But Boston warmly disputes the claim of New York to take the lead in pictorial photography, and Chicago is equally emphatic on the same subject. There are already some half-dozen rival "Salons" in the United States, and at Pittsburg, recently, a show of photographs was divided off into a "Salon" and a mere "Exhibition of photographs!" Probably not one British photographer in a thousand sees the American publications or the photography of the very newest pictorial kind which they largely illustrate. It is best described as closely resembling the inscrutable nebulosities of landscape and portrait work which were shown here some five or six years ago. In the States it is called "freak" photography. Of course, the disease in this country wrought its own cure, and we have long since passed the stage when the visitor to a photographic exhibition only too frequently found himself in a condition of despairing doubt as to what some of the productions on the walls were supposed to be, photographs or not. We know now where we are in these matters, and, when some of our American brethren begin to realise that a pictorial photograph is not necessarily an exceedingly bad one in every single respect in which camera work should excel, there will be a return to a saner state of things. Many of the recent illustrations in *Camera Notes*, the *Photo-Era*, the *Chicago Photo-Beacons*

Salon number, and the Pittsburg *Catalogue*, clearly show that the originals must be painfully poor things indeed, judged from any critical standpoint, artistic or photographic.

A WORD of reference to the third edition of *Naturalistic Photography* will not be out of place whilst the author's exhibition of photographs is on view at Russell-square. At the Paris Exhibition of 1889 Dr. Emerson studied the paintings that were exhibited there, and in his book he singles out the following men for favourable mention:—France: Cazin (for atmosphere), p. 120; Dagnan-Bouveret (for figures), p. 120; Roll (the work of a strong impressionist), p. 121. Holland: Israels, pp. 106–7. Scandinavia: Zorn, p. 108; Troyer, p. 108. America: Whistler, pp. 98–100; Sargent, pp. 8–100. Belgium: Struye, p. 86. A fortnight ago the list of the awards made by the Jury for the 1900 Exhibition was published, and the nine artists above mentioned received medals. Upon this piece of intelligent appreciation of "coming-on" men in art Dr. Emerson is to be congratulated.

COSMOS.

TRICHROMATIC PHOTOGRAPHY BY HOFMANN'S PROCESS.

SOME few months back it was announced in one of our German exchanges that Herr Albert Hofmann, of the *Photo-chemische Industrie* of Köln-Nippes, was about to introduce a new system of three-colour photography, but it afterwards turned out to be the now well-known one founded on the three-colour sensation, and the only novelty is apparently in placing on the market a complete outfit whereby three-colour prints and superimposed transparencies can be easily produced. This has now been fully described in a new work, *Die Praxis der Farbenphotographie nach dem Dreifarbenprozess*, just published by Otto Nemnich, of Wiesbaden.

Hofmann uses three light filters—orange, green, and violet—the first passing only the red and yellow rays, absorbing the blue, and thus providing the blue-printing negative; the second, the green filter, allows the yellow and blue rays to pass, absorbing the red, and thus gives the red-printing negative; whilst the third, which gives the yellow-printing negative, allows only the blue and red rays to pass.

A special repeating back is used, in which is fitted a focussing screen and the three light filters, the plates being carried in small metal dark slides.

To estimate the exposure Decoudun's exposure meter is recommended, and the number on the scale of this, when multiplied by two for the violet, six for the green, and twelve for the orange filter respectively, will give the correct exposure.

The essential novelty of the process is, however, the introduction of pigment tissue in blue, yellow, and red, which is sensitised in the ordinary way, with a from 2 to 4 per cent. bichromate bath, using either the potassium or ammonium bichromate, and suiting the strength of the bath to the time of the year; thus, 2 per cent. in summer, 3 per cent. in spring and autumn, and 4 per cent. in winter. The blue pigmented paper should be sensitised in a 2 per cent. bath of potassium bichromate to which 1·5 per cent. of ammonia has been added, whilst the red and yellow tissue should be sensitised in a 2 per cent. bath to which 0·1 per cent. of alum has been added. The paper is to be first soaked in water for ten seconds, then immersed in the chromate for ten seconds, and then squeegeed down to a sheet of waxed glass so as to thoroughly free it from excess of solution, and then stripped and hung up to dry.

Printing is effected in the usual way, a safe edge being given to the negative, and a photometer, a special one being recommended, is used in the ordinary way. The pictures are soaked in water, and then squeegeed to waxed glass, allowed to remain under pressure for from ten to fifteen minutes, and then developed, commencing first with water at about 20° to 25° C. till the paper can be stripped off, and then using water at 30°, 40°, or even 55° C.

The yellow picture is now squeegeed to the ordinary double transfer paper and allowed to dry, and on this the blue picture laid and accurately superimposed after they have been soaked in a special

gelatine solution and then dried, and on the green picture thus formed the red picture transferred. If the result is to be a transparency, then the yellow is squeegeed on to the blue picture, the two stripped from the glass, and this green film picture squeegeed on to the red print, but in this case a special transparency tissue must also be used.

A special instrument, called the photo-chromometer can be obtained, by means of which the three pictures may be experimentally and temporarily superimposed, to see whether the colour rendering is correct or not.

Further advance is promised in the shape of a film camera with rollable films, with which forty-eight triple negatives can be made without recharging. The necessary light filters and all papers, &c., are now, however, on the market.

REFLECTOR HAND CAMERAS IN INDIA.

THE June number of our Calcutta contemporary, *St. Veronica*, reaches us in an unfamiliar coloured cover. Green replaces khaki (everything brownish is called khaki in Great Britain to-day), and there is a representation of St. Veronica with the imprinted handkerchief. By way of frontispiece a portrait of Mr. George Ewing, the editor, is given. We at once add this picture of our *confrère* to our collection, for Mr. Ewing's vigorous and skilful conduct of his paper have long marked him out to us as a man of singular ability and breadth of view. In our pages, a few months ago, the subject of reflector hand-camera needs formed the subject of discussion. We take from *St. Veronica* a letter by Major Phillott, who has some aspirations on the same theme. According to this gentleman, what is wanted by Indian amateurs is a reflector camera, quarter-plate or less, that fulfils the following conditions:—

1. The reflector, when set, must form a light-tight compartment behind.

2. The shutter (focal plane) must be capable of being wound, and its speed altered from the outside. This would, of course, necessitate a projection in the camera, a minor disadvantage.

3. The dark slide, whether a double-back or changing box, must be manipulated from the outside. For preference it should be capable of being totally withdrawn.

4. A T-level must be attached to the full-sized finder, so that the operator, while focussing, can also accurately level the camera.

5. The extension must be great to permit of lenses of long and varying focus to be used.

6. The press-button, or release, must either be flush with the camera side or protected by a projection (as in the older pattern keyless watches), or else fitted with a safety bolt (as in a rifle) to prevent its being "fired" accidentally when carried by a coolie or a mounted orderly.

The above are *necessities*; the following are merely *conveniences*:—

(a) The iris diaphragm might be fitted with a clicking arrangement as in the N. & G. cameras; the worker then knows what stop he is using without having to turn the camera round to look.

(b) The focal-plane shutter might be constructed to give longer exposures than $\frac{1}{10}$ of a second—say $\frac{1}{15}$ or $\frac{1}{8}$.

(c) The lens might be fitted with a self-capping device; or, if instead, the front of the camera be protected by folding doors, they should be light-tight and dust-proof.

(d) The lens mount and its flange might be made with an interrupted screw.

(e) The focussing pinion might be flush with the camera.

(f) A scale for focussing by distance might be added.

As this camera would essentially be a hand camera, it would be of minor importance whether it were capable of being used on a stand or not. If required for use on a stand, it should be fitted with the N. & G. tripod screw and bush, as well as with a second shutter giving pneumatic exposures up to half a second or even more. Whether the advantage of being able to take vertical as well as horizontal pictures would be a sufficient compensation for the necessary increase in the size of the camera, or whether it would not, is doubtful.

THE AMATEUR PHOTOGRAPHER AS KNOWN FROM BEHIND A PHOTOGRAPHIC COUNTER.

[A paper read before the London and Provincial Photographic Association.] WHEN our Secretary asked me to give a paper before the London and Provincial Association, I had no idea of what subject to treat. We have

had papers so often here on hand cameras, toning, developers, and other scientific subjects that I decided not to touch any of these; to go out of the beaten track, and give you some of my experiences of the photographic amateur as known from behind the photographic retail counter.)

The amateur photographer (the beginner, of course, I chiefly refer to) is a rather peculiar person. He expects you to be a regular walking encyclopædia. After buying a pound of hypo he will ply you with a dozen or more questions, all of which have to be answered in their proper order.

"What are the best plates to use now?"

"Will So-and-So's S.R. plates be fast enough to take an express train?"—they always take an express train, going at about 100 miles an hour, with stop f-32, in a good light—and "at what speed should the shutter work?"

"Is the toning and fixing bath permanent?" A friend of his told him it was not.

He has also a lot of old negatives at home of no further use to him. "Could we take them back and get them recoated for further use?"

When he is politely told that we cannot entertain this latter request, he seems rather disappointed, and departs, apologising for taking up so much of your time.

Meanwhile another customer has been waiting to see you about a hand camera he bought about a week back. He explains that he has exposed several plates, but has failed to get an image on any one of them. You examine the camera carefully and find it in perfect order. You therefore suggest to him that perhaps he forgot to release the shutter, or used f-44 stop by mistake. No. He was very careful about these items. Eventually you find out that he had forgotten to remove the dust cover in front of the lens before exposing the plate. This, of course, explains the mystery, and he goes away perfectly happy.

One of the most peculiar and laughable incidents I ever had was when a customer came to me and wanted to know what was the matter with some unexposed plates which he had in his hand camera with him. He went on to explain that the plates had been in the camera for some little time, the camera being kept in his bedroom. Meanwhile they had a case of scarlet fever in the house, the patient being in the same bedroom, this room afterwards being fumigated by the doctor's orders. A day or two afterwards he had occasion to use his camera, and when examining his plates he found them all covered with red rust on the back, which he could not understand. He could only put it down to the fever having some action on the plates. Needless to say, I could not offer any explanation, and so took the camera down to the dark room to unravel the mystery. This mystery turned out to be that the plates had not caught the fever, but were *backed plates*.

Talking of backed plates, I fancy that there must be many amateurs who do not know what backed plates are. I am often asked the meaning of backed plates, what they are for, &c. Some time ago I sold a box of backed plates to a customer, who came back a day or two afterwards, and wanted to know what I meant by selling him plates on which he could get no image. I told him I was not aware I had done so, and asked him if he had got them with him. "Yes," he had. These I tested, and found them perfect. I found out afterwards that he had been exposing on the backed side instead of the film side.

Of all the questions you get asked oftenest is the one, "What plates to use?" A customer is going to the seaside: "What plates shall he take?" "How shall he take the sea? Would it be best to stand up on the sands or sit down?" I thought of suggesting that he should stand on his head for a change.

Some amateurs always will have special rapid plates—the fastest they can buy. They somehow think they will not get a result if they don't have the fastest plate procurable, and this is one of the chief reasons of their troubles. Such an amateur does not know how to treat them. In nine cases out of ten they are grossly over-exposed; of course, he blames the plate.

A beginner had purchased an outfit which included a Dallmeyer lens. After explaining to him the way in which to work the apparatus, he went on his way to try his luck. A day or two afterwards a letter came through, saying that, after a great deal of difficulty, he had managed to fix the camera up, but he found that the glasses of the lens had been put in wrong, as the view was upside-down. He thought it strange that a firm like Dallmeyer should make such a mistake.

Another beginner brought in some of his negatives to me, saying they were out of focus round the edges. I explained to him that by using a smaller stop he would obtain sharper negatives. His answer was that he had been told that he would strain the lens if it was stopped down too much.

Only last week an old gentleman came in and wished to see "Lancaster" camera, which was shown him. The first thing he did was to unscrew the lens and examine it. He asked if it was a Lancaster lens, and was told it was. He said he did not think it was, as he was told that the maker's name would be printed on the glass.

Hydroquinone, ready-made, is the amateur's favourite developer. I wants something simple and clean. It is in development where I makes his first mistake. Some under-develop, so that the negative is mere ghost, while others grossly over-develop, some negatives I have examined being so dense that you could not see the strongest daylight through them; indeed, they would take several days to print even in the sun.

The chemical side of photography such an amateur has a very hazy knowledge of. One customer asked for a bottle of Eau-de-Cologne developer, by which I found out he wanted hydroquinone. Hypo has several different terms, such as hypophosphite of soda, hyposolite &c. soda, &c.

Spots on his negatives are another great trouble with the beginner, the cause of which is generally put down to the lens. The other day an amateur brought me some plates, and complained he got a single spot on all his negatives exactly in the same place on every plate he used, and he thought there must be a spot on his lens. I examined the lens, but failed to find the said spot; so, to convince him, I exposed a plate in the camera, and developed it, but I could not obtain a spot on the plate. These complaints are all mysteries, and they remain mysteries to the end, as he always asserts that he never does this or that when suggesting the probable cause.

The questions put by ladies are sometimes rather embarrassing to the assistant. I remember a lady coming in and asking the assistant to show her his legs, meaning tripods, of course.

The hand camera is the amateur's favourite instrument, and a hand camera he will have. But I often think too much is expected from the hand camera, and the uses it is put to often result in utter failure. I frequently have negatives brought in to me with the complaint that the lens is out of focus, but when I come to examine the negative it shows a distinct double image, and upon further inquiries I find he has been making a time exposure of about two or three seconds with the camera held in the hand, resulting in a blurred image, of course. One great difficulty we have behind the counter is to convince the amateur that he is wrong in the manipulation of his work, and that the failure is due to his procedure of working, but I will say that occasionally we get one who admits his faults, and then you feel quite pleased with yourself. I trust that you will not think I put down the amateur as a duffer in this paper. I have merely given you my experiences of the beginner in general as found from behind the retail counter during an experience of some years.

E. T. WRIGHT.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

At a meeting of the Council of the Photographic Convention of the United Kingdom, held at Anderton's Hotel, Fleet-street, June 13, 1900, the following gentlemen were nominated to serve on the Council, to be elected at the Annual General Meeting at Newcastle-on-Tyne, July 11, 1900:—

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|--------------------------------------|---------------------------------|
| Harold Baker, London. | Percy Lund, Bradford. |
| C. A. Barkas, Newcastle-on-Tyne. | J. L. Lyell, London. |
| W. Barry, Hull. | Colonel Lysaght, Pretoria, S.A. |
| James Baty, Newcastle-on-Tyne. | A. F. Mowll, Liverpool. |
| Godfrey Bingley, Leeds. | Rev. T. Perkins, Blandford. |
| Walter S. Corder, Newcastle-on-Tyne. | J. Porritt, Leicester. |
| Alexander Cowan, London. | Ralph Robinson, Redhill. |
| W. E. Cowan, Newcastle-on-Tyne. | J. A. C. Ruthven, Dublin. |
| T. R. Dallmeyer, London. | A. Seaman, Chesterfield. |
| W. E. Dunmore, London. | H. Sturmey, Coventry. |
| Dr. P. H. Emerson, Christchurch. | Alexander Tate, Belfast. |
| S. H. Fry, London. | W. Taylor, Leicester. |
| F. Gandy, Derby. | J. J. Vezey, London. |
| J. Pattison Gibson, Hexham. | J. H. Walker, Leeds. |
| H. M. Hastings, London. | E. J. Wall, London. |
| E. J. Humphery, London. | H. Snowden Ward, London. |
| H. Vivian Hyde, London. | S. B. Webber, London. |
| Sydney Keith, Hounslow. | G. Watmough Webster, Chester. |
| J. J. Kirkwood, Tynemouth. | J. B. B. Wellington, Elstree. |
| C. Phipps Lucas, London. | A. Werner, Dublin. |

Vice-Presidents are, by Rule X., members of Council *ex-officio*. Forty members of Council are to be elected, exclusive of *ex-officio* members. Members are at liberty to add the names of any other gentlemen to the list, should they desire it, but the total number of those voted for must not exceed forty. This voting list is to be delivered to the President at the Annual General Meeting at Newcastle-on-Tyne, July 11, 1900.

ON THE FADING OF GELATINE NEGATIVES.

The following paper, for which we are indebted to our contemporary, *Anthony's Bulletin*, was suggested by the recently published experiences of Dr. Isaac Roberts, F.R.S., relating to the fading of images of stars in gelatine negatives.]

HAVE years ago pointed out in photographic publications the probable fading of the negative images made on gelatine films on account of the impossibility of eliminating all the traces of hyposulphite by washing off the instability of the silver hyposulphite formed during the fixing, which decomposes almost instantaneously, and from which originates, more or less, the sulphuration of the silver forming the photographic image. We all know that the positives made on gelatine paper fade more rapidly than those made on paper prepared with another vehicle, though not all of the latter stand the test of time, and this owing to the manner they are fixed, which is similar in every process. The case point, however, is only the second that has come to my knowledge of the fading of the negatives made on gelatine as a medium.

In my long practice I have never observed that the collodion negatives are apt to fade, and never have I seen it mentioned in photographic publications.

I have before me, when writing this article, a series of collodion negatives made by Mr. Lewis M. Rutherford to photograph the solar spectrum. The range of practical sensitiveness shown on one of those plates extends from λ to beyond λ at 272, the maximum of intensity being near λ . On both sides the impressions decrease in opacity, and become almost invisible beyond λ and $\lambda \frac{1}{2} L$, still the faintest impressions are as distinct now April 1900 as they were when the negative was made, April 9, 1866. There is no trace of fading, although, except varnishing, no extra care has been taken to preserve them from the atmospheric and other influences.

The colour sensitiveness and the intensities vary considerably with the composition of the collodion, the exposure time, silver bath and developer being the same. But here is not the place to describe the process employed to obtain the results above mentioned, which were considered the best; it suffices to say, that out of the seven negatives not one has in the least faded.

If we except the extreme sensitiveness of the silver-bromide emulsion in gelatine, and the possibility of increasing its colour sensitiveness towards the red by ripening, which is of so great a value in orthochromography, we must acknowledge that by the wet-collodion process excellent results are obtained surely and without difficulty by simple rapid operations, entirely under the control of the operator. But on account of its want of sensitiveness, which is about thirty times less than that of the ripened gelatine silver bromide, the latter is, so to say, a *sine-qua-non* in astronomical photography, and still it requires an exposure of many hours to obtain an impression from the faint stars. Of course, the ordinary negative images on gelatine plates—portraits, landscapes, &c.—if they fade, it is only in the delicate details, and, consequently, they remain serviceable; but in the case now in question everything originally photographed should remain, else they become without value for recording the changes occurring in the heavens during the course of time. Hence we must find out the causes of fading, and how it can be avoided.

The causes of fading in photographs are well known by reason of the researches of T. F. Hardwick, and especially those of Davanne and Girard, made in 1859–60–61. They necessarily apply to negatives, although very few cases of deterioration have been recorded; but, besides the nature of the silver deposit forming the image, the process was quite different from that now generally employed.*

Fading cannot arise from the development. This needs no comment. The causes originate from the manner of fixing, the chemical actions resulting therefrom, and from the subsequent operation, *i.e.*, the washing to eliminate the hyposulphite compound, which the gelatine retains quite strongly, owing to its absorptive nature when swelled. In fact, it is doubtful whether it can be entirely eliminated from that matter except by chemical means, and this is not without objection.

Let us see how the fixing is done in the process now under consideration.

* We have a negative on albumen plate, made in 1852, which has turned a little yellow, and a positive on plain paper, made by development with silver nitrate, which has also turned yellow and faded, but only in the delicate details in the lights. It was made in 1850.

After the development the plate is rinsed, then immersed in the sodium hyposulphite bath until the silver bromide is dissolved. When the bath is new, and therefore not in a state of decomposition, the only occurring chemical action is the formation of the soluble double silver and sodium hyposulphite. Hence, before washing, there are in the film the sodium hyposulphite and double salt dissolved therein. If the compound were wholly eliminated, the image would be permanent; if not, the silver hyposulphite, being unstable, will, in a certain period, produce the sulphuration of the silver, hence a strong cause of fading.

By this manner of operation it sometimes happens that the negative comes out from the fixing bath with a yellow fog, so called, due to the alkaline developer retained in the film. To avoid it the plate is immersed for a moment in acidified water, then rinsed, then fixed. The result is obvious, since the hyposulphite is decomposed in presence of an acid, no matter how diluted.

The images are now generally fixed in an acid clearing bath, which was introduced in 1890, to obtain negatives free from yellow, greenish or dichroic fog, according to the developer employed. This bath is compounded with sodium hyposulphite, sodium sulphite, chrome alum, and sulphuric acid. In such a bath sulphuration is inevitable, since the bath is in a state of permanent decomposition, giving rise to sulphur dioxide and unstable polythionic salts, sulphur being also deposited. The results are again obvious. Hence, whatever be the manner of operating with sodium hyposulphite as a fixing agent, a cause of fading exists, and, for such weak impressions as those formed by the faint stars, the writer believes that it should be discarded for a fixing agent having no action on metallic silver.

It has been said in the beginning of this article that negative images on collodion film have stood the test of time for about forty years without any visible alteration, and very likely they will remain without change for a good deal longer period. They were fixed by potassium cyanide. Why not use that salt for the fixing of gelatine negatives? There is no serious objection in doing it. However, except with the pure salt, it cannot be employed in the same way as in the collodion process, for the commercial article, containing a great proportion of potassium carbonate, gives a strongly alkaline solution which softens the gelatine film, partly dissolves it,* and, as a consequence, produces blisters, rectification, and alters the dimension of the image. But, when alcohol is added to the solution, and the gelatine is previously hardened by alum, this action is nullified, as it was years ago demonstrated by the savant photographer of Bellevue Hospital, Mr. O. G. Mason.

Another and more serious objection to the use of potassium cyanide is its dissolving action on metallic silver, if allowed to act for a certain period, depending upon the strength of the solution. In fact it was employed to reduce the intensity in the collodion processes. In our practice we never found that any of the details of the image were injured when the plate was washed immediately after the silver haloids had been dissolved, which requires a few seconds. Perhaps, however, the very weak impressions of some of the stars might be impaired; it is an experiment to be made.

The negatives can also be fixed by ammonium sulphocyanate, as proposed by Mr. Meynier in 1863.† This salt is not poisonous, and has very little action on metallic silver, but it dissolves gelatine rapidly, which, however, is prevented by the addition of alum. Mr. P. Mercier, who made a study of fixing by the sulphocyanates, recommends that the operation be preceded or followed by treating the gelatine film with a five per cent. bath of alum. The fixing solution may be compounded thus:—

Ammonium sulphocyanate	10 parts.
Alum	5 "
Water	100 "

In these conditions the gelatine film somewhat increases in volume, but the image suffers no modification.

The sulphocyanate, much less dangerous than the cyanide, has many advantages over hyposulphite. It is not altered under the influence of traces of acids, and, like the cyanide, it does not leave in the gelatine film any agent of fading after washing as usual in water several times renewed. While fixing, it is recommended to use two baths; the second to ensure a complete elimination of the silver sulphocyanate formed. The potassium salt can be employed instead of the ammonium, but it dissolves a less quantity of the silver haloids.

P. C. DUCHOCOIS.

* According to M. Vidal, it does not dissolve gelatine, but only swells it considerably. See *Bulletin de la Société Française de Photographie*, vol. xxix.

† *Bulletin de la Société Française de Photographie*, vol. ix.; *Humphrey's Journal*, vol. xiv.

FOREIGN NEWS AND NOTES.

A New Intensifier.—Mangin suggests, in *Photographische Chronik*, the following mixture instead of the usual mercuric intensifier:—

A.

Old hydroquinone developer.....	50 parts.
Ten per cent. solution of citric acid.....	10 "

B.

Potassium ferricyanide	1 part.
Distilled water	50 parts.

Solution B is added to A as soon as the latter has become clear, and the mixture is then well shaken and filtered and the negative immersed in it.

Cyanine Sensitising.—According to the *Photographische Chronik*, cyanine is still the best sensitiser that we have for red, but it is, unfortunately, rather difficult to use, as it is soon decomposed by the carbonic acid of the air. As a preventive of this the following bath is recommended:—

Alcoholic cyanine solution (1 : 1000)	6 c.c.
Alcoholic codeine solution (1 : 1000)	34 "
Pure aniline	5 drops.
Distilled water	960 c.c.

Plates should be bathed in this solution, freshly prepared, for two minutes, then rinsed with dilute alcohol (1 : 30) and dried.

Restoring Yellow P.O.P.—Professor Namias, in *Il Progresso Fotografico*, points out that gelatino or collodio-chloride paper which has become yellow by improper keeping can be restored to its pristine whiteness by immersion for some minutes in a two per cent. solution of ammonium persulphate rendered slightly alkaline with ammonia. When dried, the paper thus treated will yield excellent prints, which, however, are not quite so intense as those made on fresh paper; but this loss of intensity may be got over by the addition of a small quantity of silver nitrate to the persulphate solution, and that then it is difficult to detect any difference between such prints and those on freshly prepared paper.

A Sulphocyanide of Lead and Gold Bath.—Professor Lainer communicates a note on this subject to the *Photographische Correspondenz*, and points out that most of the sulphocyanide baths contain far too much of this salt. A bath which contains twenty-four parts of sulphocyanide to the thousand attacks the delicate half-tones of the print, causes pit markings in the gelatine, and softens the skin of the fingers, and frequently gives double tones, and it does not tone well. He has decreased the proportion of sulphocyanide to 2·5 parts per 1000; this generally gives brown tones, though blue-violet tones are those most generally desired. By the addition of lead nitrate this is attained, but the lead salt must not be added haphazard, for, if lead nitrate be added to sulphocyanide of ammonium solution, a precipitate of sulphocyanide of lead is formed, but, if it be added to a solution of sulphocyanide of gold, there is no precipitate, and there is formed an excellent toning bath which gives excellent tones in from twenty to twenty-five minutes. The following stock solutions should be prepared:—

A. Ammonium sulphocyanide 100 grains, water 1000	c. c.
B. Potassio-chloride of gold 1 grain	100 "
C. Lead nitrate	200 grains " 1000 "

For use mix:

Water	1000 c. c.
Solution A.....	25 "
" B.....	50 "
" C.....	30-50 "

The above quantity of bath is sufficient for from forty to fifty prints 13×18 cm. The prints should be washed before toning in four or five changes of water, and fixed in a ten per cent. solution of hypo.

A One-solution Hydro-metol Developer.—Guillemin strongly commends the following developer: Boil 900 parts of water, and whilst still hot dissolve in order the following ingredients, taking care that one is completely dissolved before the next is added:—

Sodium sulphite	150 parts.
Hydroquinone	5 "
Metol	5 "
Potassium carbonate	30 "

For use, 1 part of this solution is mixed with 3 parts of water.

A New Calcium-carbide Process.—Herr Paul Wolff, Berlin, has just patented a new process for the manufacture calcium-carbide which does away with the electric furnace which has hitherto been used. To the mixture of lime and coke powder aluminium is added, and the whole fired by a fuse or similar device. The aluminium combines with the oxygen of the lime and produces such a high temperature that the lime melts, is reduced, and the calcium combines with the carbon. If this statement be true, the price of carbide should suffer a fall.

Zenker's Lehrbuch der Photochromie.—To all those who are interested in heliochromy, the republication of this work which is but little known, but which set forth in 1868 the distinguished author's researches and views in that particular branch of photography in natural colours now so indissolubly connected with the name of Professor Lippmann will be welcome. This new edition, which is published by Vieweg & Sohn, of Brunswick, is edited by Professor Dr. Schwalbe, who was Zenker's fellow-professor at the Kaiser Wilhelm Realgymnasium in Berlin. Professor Kreel has written an account of Zenker's life. The editor has practically given us the original work, with merely some matter descriptive of now well-known instruments omitted, and Herr Tonn brings, in a brief, concise manner, our knowledge of the subject up to the present date, and, to those who have been unable to obtain a copy of the original—and this is by no means easy to get—the new edition should be highly appreciated.

REDUCING OVER-PRINTED PAPER BROMIDES.

In a recent leaderette of THE BRITISH JOURNAL OF PHOTOGRAPHY, March 30, the question is asked, "If the reduction of over-printed pictures is worth the time and trouble expended upon them?" and the verdict pronounced by the writer is, "No, the game is not worth the candle." The article goes on to say that it takes less time to make a fresh print than to vamp up an ill-timed or over-exposed one. If by ill-timed is meant under-timed, then I fully agree; but on the phrase "over-exposed" I venture to think that the best way to produce a perfect enlargement or a perfectly printed bromide is to slightly over-expose and slightly over-develop and this applies equally to all descriptions of bromide developing-out paper; which will, for shortness, be described as D.O.P., in the same way that printing-out paper is known as P.O.P. I wish to say here that a perfect D.O.P., be it from a negative by contact or by enlargement, must, like a good lantern slide, be both over-exposed and over-developed, and, like the lantern slide, be reduced afterwards.

The exact amount of over-exposure and over-development must be determined (a) by the make of paper, (b) by the developer used; for some papers, like some dry plates, have but little latitude.

With bromide paper for enlargements, I find the treatment required is much about the same with all papers, whether Morgan & Kidd's, Eastman's, Marion's, Barnett, Cadett's, Ilford, or Lumière's. These are all extra-rapid papers for enlarging, and cannot well be used for contact work, especially if the exposure is made out of doors; but, even with gas-light, the action is so rapid that a slower paper is preferable, and of these there is even a greater variety, and the results vary very considerably. Personally, I like a paper that allows about ten seconds' exposure at five feet within an open doorway facing north; the frame is stood on end, and so looks out upon the horizon—i.e., the trees and houses facing—and not to the clear open sky—the time of year March, and the locality London.

As the summer advances, doubtless albumenised paper will again be adopted by many who have had recourse to the D.O.P. during the slow light of winter. Ready-sensitised albumenised paper is only about half the cost of the D.O.P., and I have started by ordering five quires of paper.

The other statement of the writer is, "that it is the practice of professional printers, when a print is over or under-printed, to throw it amongst the waste; and that is also the custom with professional enlargers as a matter of economy."

Regarding printing, I can only say that, as there are so many kinds of prints, papers, and surfaces, some papers being coated with gelatine, others with albumen, and these all having a regular gamut as to bromide, chloride, tartrate, or some other salt of silver, the makers giving their paper fancy names—as Eagle, Venus, Dekko, &c., I cannot spare space to treat upon anything else except paper coated with gelatine. Referring especially to prints produced by the developing-out process, if printers and enlargers really do throw away their over-printed or over-exposed prints, I can only remark that, if these prints are on gelatino-silver paper like the paper for enlargements, they have been (1) needlessly filling the waste-paper basket, (2) needlessly emptying their own pockets—a reckless proceeding and one not in accordance with human nature.

Those who have previously been so ill-advised as to throw away their best pictures (and by that I wish to describe the over-exposed or over-

developed, D.O.P. print or the bromide enlargement) need not do so any longer, and, as previously stated, I really do consider the best way to make perfect prints and perfect enlargements is to overdo them a trifle and reduce them afterwards, either locally or all over by means of a bath.

A piece of 15×12 bromide paper costs $7\frac{1}{2}d.$, plus the time in arranging the enlargement and the development of the same. The profit on the finished article is necessarily diminished by the waste. But reducing over-printed or over-exposed bromides is the text, and to do so without alteration of colour and without affecting the permanence are the two important considerations.

Recently I came across the statement that one gentleman advocated over-developing lantern slides until they looked quite opaque (by transmitted light) before fixing in the hypo bath, and that he reduced them to the proper clearness and brightness by using the well-known Howard Farmer reducer of ferri-prussiate potash with hyposulphite soda; now, this cannot be used satisfactorily with paper, as it stains the fibres.

The only reducer that I have come across for bromide papers and also for the blue prints (those produced upon ferro-prussiate potash paper) is our old friend and poison, potassium cyanide; this will remove any slight deposit of colour in the high lights of a picture or take down the deepest depth of darkness in an enlargement of a print; in fact, you can clear the image right off, leaving the paper perfectly white.

In using potassium cyanide there are two things to observe: (a) that used must not be returned to the bottle; (b) the pure white cyanide sold as containing sixty to seventy per cent., and costing from 1s. 6d. to 2s. a pound should be used.

The sort I like best is cut or broken into lumps, and looks very much like cube sugar without the sparkle.

I am aware of various reducers, such as citric acid and alum, &c., and the value of thio-carbamid and citric acid, as per maker's formula, is not to be despised; its action is slow and sure. A dozen 12×10 or 15×12 , immersed in it, are brightened and cleared immensely. The first print is ready to take out as the last is placed in it, and it will remove the pink colour that sometimes is given to paper developed with ortol. Many prefer this colour to remain, and consider it an improvement; so, if you desire to retain it, use cyanide to clear with instead of thio-carbamid. As an ounce of thio-carbamid costs about the same as a pound of cyanide it is too expensive for commercial work.

Potassium cyanide is awkward stuff to weigh in small quantities, and I find that the lumps are very much of a size, and weigh from 100 to 120 grains each, so, I just throw two lumps into a ten-ounce wide-mouthed bottle, and fill with water. If any deposit after it has dissolved, decant into a ten-ounce graduate, and throw away the bottoms or else filter. So the formula would read thus:—

Potassium cyanide (white) ... 2 pieces, or about $\frac{1}{2}$ ounce.
Tap water to make up 10 ounces.

In using there is one advantage, the same washing water will remove the hypo and the cyanide.

To use, take the prints from the hypo, and either throw into a dish of water, or place them on a piece of glass to drain off the surplus hypo solution, and then into the water. Now you have to decide what the prints require. Is it a good general clearing, or will some of them require local treatment? Any how, clear first. To those whose skin will allow of dipping their fingers in cyanide I advise a weak bath of, say:—

Stock solution cyanide 1 ounce.
Tap water 20 ounces.

If required to be of greater strength, it is better to use ebonite pliers.

The above will be sufficient for a dozen large pictures, 12×10 or 15×12 . Take them one at a time, slightly drain, and immerse. Now add one or two more, remove the first one, throw it on to a piece of glass, and you can then judge the result. If you have a rose tap, well sprinkle and wash each print upon removal from the cyanide, and do not forget the action continues after removal, and a good washing is really needed at once and sharp. This is the only caution I need give.

Try first on a waste print or a very dark one of the day's batch.

For local reduction the print is best wet; use a brush or a piece of cotton-wool. The best brush on the market is the one used for process work, as it will stand anything. It is sold by Penrose & Co., Lloyd-square, W.C., 1s. 4d. each, post free, and is described in their catalogue as the Atzpinsel Continental etching brush. If a hole be bored, or a piece of string attached, and the brush hung up after a rinse or so, it will really last a long time. Of course, any common camel's-hair will do, or, as before stated, a tuft of cotton-wool for tough fingers. To use the brush, pour out, say, a quarter or half an ounce in a graduate of stock solution cyanide, and add half an ounce of water or so. You require it strong enough to do the work in thirty to forty seconds, especially if you have a number to treat. Dip the brush in the graduate, and pass over the damp print previously placed on a sheet of glass, of course touching those parts that are darkest first. Keep the brush moving, and in a few seconds you will notice a general lightening. Work the brush well about to prevent lines or markings, but only over that part or parts you desire to reduce, as the general clearing up of the whole of the print should have been performed before attempting local work.

Reducing by cyanide is like developing with the best of all developers, ortol. In both the action is continuous, so that you need to turn on the

tap before the final result is attained; in fact, it is better to turn on the water and wash, doing this several times, cyanide and wash, see the result, and cyanide again, wash again; it is easy enough. In fifteen seconds, under the tap, the action is stopped, and in doing all this you have the satisfaction of knowing you are also washing out the hypo. When sufficiently reduced, place the print in your washing tank, and let a good flow of water pass through at first. See the prints do not stick together, or there may be marks. Label the bottle, "Poison—Cyanide," and put it away in a safe place. For under-exposed prints—if this applies to printing-out paper, albumen, or gelatine—the remedy is, not to remove from the frame until sufficiently printed; but, if it refers to developed-out prints, I find a great deal can be done by removing the print from the developer directly it is discovered it is under-exposed. Place upon a piece of glass, having previously poured out some of the alkali solution generally known as No. 2, and brush it on the print; rub it well in, dip the print into the developing solution, remove and brush again, using plenty of the alkali, but keep the prints moving, or stains will occur.

ARCHER CLARKE.

PANORAMIC CAMERAS: STONE'S SYSTEM.

[Patent No. 6235 of 1900.]

As much interest attaches at the present time to this subject, we give Mr. M. T. Stone's specification in full. "The chief feature of my improvement is a flexible, or, more properly, an elastic adjustable holder for the sensitised film and the ground film upon which the image is focussed, whereby the image thrown on the film by the lens may be rendered sharp at every point. Such holder is employed and particularly useful with a lens which is adapted for adjustment of focus corresponding to the distance of the camera from the object to be photographed."

"The body or box, 1, of the camera has the form of a truncated sector. A flexible bellows like tube, 2, composed of leather or some other suitable material, is secured to such truncated end, and to the front plate or board, 3, in which lens-holder, 4, is arranged. The plate, 3, is provided with vertical journals, 5¹, at its ends, by which it is held rotatably in the front ends of parallel rack bars, 6, that serve as means for adjusting the focus of the lens. Said bars, 6, slide endwise in suitable guides or keepers secured to the top and bottom of the body, 1, of the camera, as shown. The means for adjusting said rack bars, 6, are two horizontal shafts, 7 (fig. 4), whose spur pinions, 8, engage them and a vertical shaft, 9 (fig. 4), having bevelled gears 10, that engage similar ones, 11, on the shaft, 7. The vertical shaft, 9, projects through the top of the camera, 1, and has a milled head for use in rotating it."

It is thus apparent that the lens may be readily adjusted by the shaft and gear mechanism toward or from the curved back of the camera where the sensitised film is located for the purpose of focussing the image on the latter, and that the panoramic effect is attained by rotating the lens mount, 3, through the arc of a circle required to sweep over the length of the greater arc described by the films at the back of the camera. It is apparent that the flexible tube permits both these movements to be made. The rotation of the lens mount is effected by a lever arm, 12, fixed horizontally on upper journal, 5, of the plate, 3.

"The light rays are directed from the lens through a tube, 13, which is fixed to and rotates with the plate, 3. Said tube is narrow horizontally (see fig. 2), but enlarged and flared vertically (fig. 3), as required to properly direct the light rays upon the film."

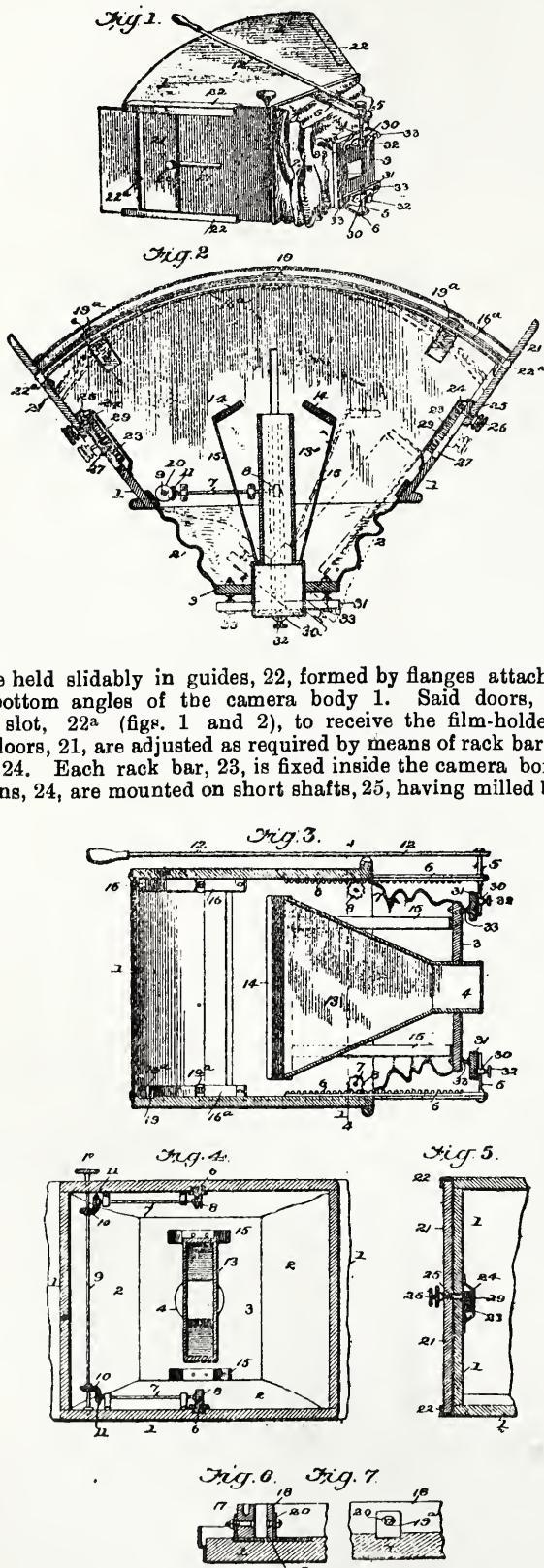
"Light screens, 14, are supported upon the free end of plate springs, 15, attached to the lens, mount, or plates, 3, and projecting horizontally therefrom. Said screens are thin, flat, and oblong wooden plates, covered with dark fabric, preferably black velvet."

"When the tube, 13, is swung laterally either way, a screen, 14, will come in contact with the side of the camera box, 1, and the springs, 15, which are yielding, the screen will be forced over the end of the light tube, 13, and thus exclude light, so that none can fall upon the film. The latter can then be removed. When the lever, 12, is again removed, that is to say, in the opposite direction to make another exposure, the springs, 15, will obviously remove the attached screen, 14, from the tube, 13."

"It has been usual heretofore to arrange and hold the sensitised film and the ground film for focussing in a fixed position. Consequently the focus could not be changed without throwing either the centre or ends of the film out of focus, since, when lens is moved, the radius of the circle must be adjusted correspondingly, otherwise the distance from the lens to all parts of the circle will not be the same. It is therefore impossible to obtain a sharp image on all portions of the film. I have devised a flexible adjustable holder for both the sensitised film and ground or focussing film, and thereby converted a panoramic camera into a practical instrument, which can be perfectly focussed for different distances so as to obtain a perfectly sharp image on all portions of the film."

"My film-holder is composed of two like parts or sections, 16, 16^a, one, 16, being arranged at the top, and the other, 16^a, at the bottom of the camera body, 1, adjacent to the rear curved end of the same. Steel, celluloid, or any other suitable elastic material, may be employed in constructing the holder. Each part or section has two grooves (see fig. 6), one being formed in the rib, 17, and the other and larger

groove between such rib, 17, and a thinner rib, 18. Both ribs, 17 and 18, are connected and held equidistant by means of approximately U shaped bars, 19 and 19^a (figs. 2 and 6), which are riveted to them as shown. The central bar, 19, is fixed, but the other, 19^a, is adapted to slide. The bars, 19, may have a slot, 20, where the rivets pass through (see fig. 7), to allow movement of the latter when the film-holder is adjusted. The ends of the sections, 16 and 16^a, are attached to doors, 21,



which are held slidably in guides, 22, formed by flanges attached to the top and bottom angles of the camera body 1. Said doors, 21, have vertical slot, 22^a (figs. 1 and 2), to receive the film-holder proper, and the doors, 21, are adjusted as required by means of rack bars, 23, and pinions, 24. Each rack bar, 23, is fixed inside the camera box, 1, and the pinions, 24, are mounted on short shafts, 25, having milled knobs, 26,

travel on the racks, 23, and carry the doors, 21, with them, and the doors being connected with the ends of the film-holder, 16, 16^a, the latter will also be adjusted to describe a curve of greater or less radius. One such adjustment is indicated by dotted lines in fig 2, this adjustment being made corresponding to that of the lens focus. The image on the screen and film will be sharp at every point.

"The doors, 21, extend beyond the rear end of the box, 1, so that, when adjusted forward, the entrance of light will be prevented by the door overlapping the entrance. A vertically adjustable front is a necessary adjunct of the camera. This I provide, by adapting the plate or board, 3, to slide up or down on the shaft, 5, 5^a. The inner adjacent ends of the latter are flattened on the front side and pass through keepers, 30, which are secured to cross pieces, 31, affixed to the plate, 3, adjacent to its upper and lower edges. Clamp screws, 32, work through the keepers, 30, and bear upon flattened portions of the shafts, 5, 5^a. It is obvious that this combination of parts enables the plate or lens to be adjusted vertically as may be required, yet it turns with the said shafts, 5, when rotated by the lever, 12, as before described.

"The aforesaid cross pieces, 31, are adjustably attached to plate, 3, by screw-threaded rods, 33 (see figs. 2 and 3) to which nuts are applied, to hold the plate fixed in any adjustment. The object of the adjustment thus provided for is to enable the optical focus or centre of the lens to be centered where the rays of light cross directly under the centre of the pivot or plate, 3, otherwise the picture would show double lines. This feature of my camera allows different lenses to be used at will."

"I do not show the ground film on which focussing is effected preliminary to exposing the sensitised or photographic film, nor the dark slide, which forms a necessary adjunct of such film. The film-carrier or holder will be a sliding elastic frame adapted to slide into the space or groove between the ribs, 17 and 18. It may be made of celluloid, thin steel, or any other suitable material.

"It is apparent the lever arm, 12, may be detached, and the bellows part, 2, pushed back into the camera, when it is desired to pack or store the camera in the least space.

"I do not restrict myself to the described means for adjusting the film-holder, 16, 16^a, and also the lens. The sliding rack bar, 6, may be arranged on the outer side of the top and bottom of the camera body."

ARTIFICIAL LIGHT PHOTOGRAPHY: SPURR AND McQUAID'S SYSTEM.

[Patent No. 25,369 of 1899.]

THE system consists of a transparent reservoir, or receiver, in which an inflammable gas is stored. This gas is confined in the reservoir until it is desired to create an artificial light, when the gas in the reservoir is ignited, and the illuminating gas then creates an artificial light within the reservoir, which radiates through the transparent sides of the reservoir, and thus establishes an area of light within which the sensitive photographic plate is exposed.

The transparent reservoir, or receiver, A, is made of glass or other suitable material, and is in the form of a jar. In this reservoir, A, an inflammable and illuminating gas is stored, and, as it is desirable to produce a light rich in actinic rays, the patentees prefer to use nitric oxide gas rendered inflammable by carbon bisulphide, although we do not limit ourselves to such a gas. When this gas is ignited, a light is generated, the rays of which radiate through the transparent sides of the reservoir. Within the area of light so generated the photographic plate is exposed.

It is desirable to provide means whereby the shutter may be operated concurrently with the production of the artificial light, or the exposure effected at the same time, or slightly in advance, of the production of light. To accomplish this result, the patentees provide the arrangement shown in fig. 1. The camera, B, has its shutter connected, in the usual manner, with the pneumatic operating device comprising the flexible tube, D, and the compression bulb, D². This bulb is also connected with the light-producing apparatus by means of the tube, D³, in a manner to be described, and, as this apparatus is adapted to operate automatically to ignite the gas in the reservoir, A, when the bulb is compressed, the shutter is operated to expose the plate as the gas is ignited.

The means for automatically opening the gas reservoir, A, and igniting the gas therein, comprises a lid or cover, E, pivoted or hinged at E² upon the reservoir, and acted upon by a spring, E³, which tends to open the cover or lid on its hinge, and thus afford access to the interior of the reservoir. Removably secured upon the upper portion of the reservoir by means of the lug, a, engaged in the sleeve, b, is the ignition device, which consists of a wick-carrier rod, H, within the sleeve, H², a spring normally tending to press the wick-carrier rod toward the reservoir. One end of the wick, H⁴, is within the reservoir, H⁵, containing alcohol, or other suitable inflammable liquid, and the other, or ignition end, is adjacent to the gas reservoir.

The wick-carrier rod, H, is held retracted against the pressure of the spring, H³, by means of the triggering device (fig. 6), consisting of a trigger, J, having a tongue, J², which engages a projection, J³, on the

and held rotatably in the doors, 21, but adapted to slide in slots, 27, in the sides of the box. A box guard, 29, is arranged to cover the rack and slot on the inner side, so as to prevent entrance of light. A jam nut is applied to shafts, 25, to lock the latter, and thereby the doors, 21, in any adjustment.

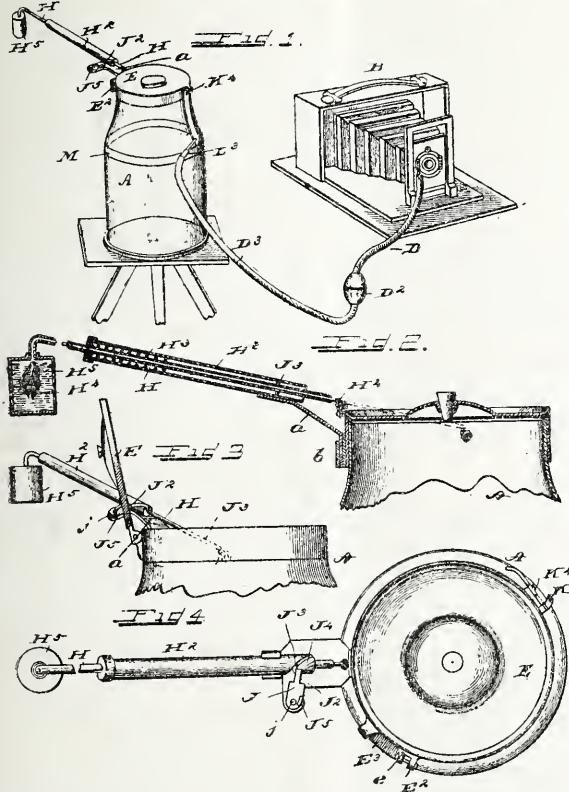
"It is apparent that by rotating the knobs, 26, the pinions 24, will

wick-carrier rod, this tongue extending into an oblique slot, J^4 , in the sleeve, H^2 , and as the tongue is engaged against one side of the slot, and engages the projection of the wick-carrier rod, this rod is held in a retracted position. The trigger, J , is loosely pivoted at j , and has an upwardly extending arm or abutment, J^5 , adapted to be engaged by the lid or cover of the reservoir when it is forcibly thrown back into an open position.

The lid or cover, E , is held shut also by means of a triggering device comprising a trigger lever, K , pivoted at K^2 to the latching head, K^3 , engaging a lug, K^4 , projected from the lid or cover. If it is desired to hold the lid permanently closed, the button, K^5 , may be brought into engagement with the lug, K^4 , as shown by the dotted lines in fig. 9.

The pneumatically operated connexion for triggering the lid or cover is shown in fig. 7, and it consists of a piston rod, L , and piston head, L^2 , movable within the cylinder, L^3 , the piston rod being connected to the trigger lever, K . A spring, L^5 , bearing on the piston head, L^2 , normally tends to preserve the latch connexion between the trigger lever, K , and the lid or cover lug, K^4 . As one end of the cylinder, L^3 , is connected to and communicates into the tube, D^3 , when the bulb, D^2 , is compressed, the air pressure acts upon the piston head, L^2 , overcomes the opposed spring pressure, and thrusts the piston in a direction which unlatches the trigger lever, and releases the lid or cover, which latter is then violently thrown backward on its pivot by the spring, E^3 .

In the backward movement of the lid or cover it strikes violently



against the trigger lever arm, J^5 , which releases the wick-carrier rod, H^2 , and, as the end of the wick, H^4 , is now lighted, an igniting flame is quickly advanced into the now open end of the gas reservoir, thus igniting the gas in the reservoir and establishing an area of light and also concurrently exposing the sensitive plate in the camera, as the pressure generated by the compression of the bulb also operates the shutter.

The pneumatic triggering piston and cylinder are held upon the side of the reservoir by a band, M .

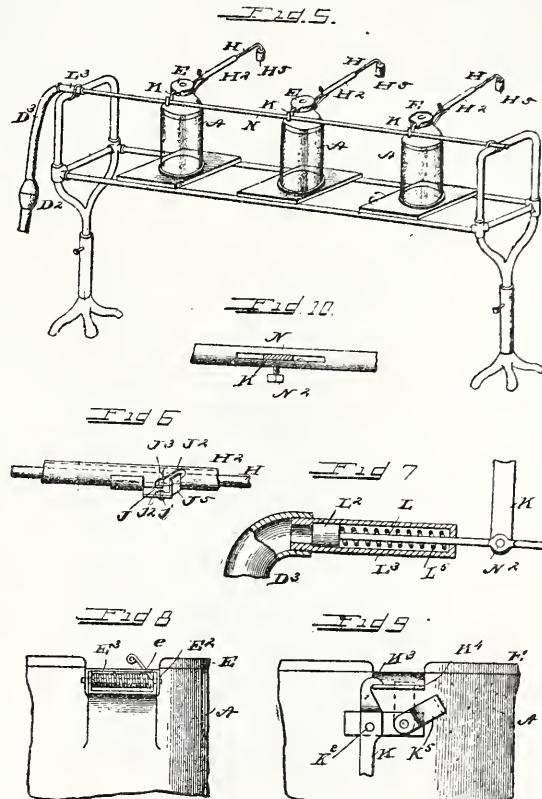
A yielding pressure device, consisting of the coiled spring, E^3 , for opening the lid or cover, is connected at one of its ends in an engaging notch, e , and, upon releasing this end from such engagement, the spring is disconnected from the cover, so that the latter may be readily manipulated.

By means of the arrangement now described the patentees provide means for automatically establishing an area of artificial light within which the sensitive plate is exposed and controls the generation of the light from the same point of operation for control of the shutter.

By providing a transparent reservoir containing a gas capable of ignition to produce artificial light they are able to obtain photographs under conditions prohibited when the ordinary flash light is produced by igniting a chemical compound in a powdered state. Thus the photographing of expensive and delicate draperies in the night-time is frequently prohibited because of injury to the draperies from the smoke and gas of the flash light. The loud detonating report is also a source of annoyance. All this is avoided by this invention, as the cover or lid of the reservoir

may be immediately closed to prevent the escape of the gas, is smokeless and noiseless when ignited, and is largely confined within the reservoirs, the generated light therein radiating through its transparent sides. Again, the reservoirs are capable of being stored or charged with the gas and are in readiness for instant use. Further, a gas may be, and preferably is, used which is rich in actinic rays.

As the gas is stored in these transparent reservoirs, a battery of reservoirs may be employed, as shown in fig. 5. Under such conditions a plurality of reservoirs, A , are assembled and mounted upon a suitable table or supporting frame and connected together, in whole or part, by an operating rod, N , which is laterally thrust or moved by a pneumatic device



similar to that employed to trigger the lid or cover of the reservoir. When the bulb, D^2 , is compressed, the piston, L , connected to the rod, N , imparts a lateral movement to the rod, and as the trigger, K , holding the lids or covers of the reservoirs, is secured to this rod, its lateral thrust is operated to release the several lids or covers, each of which opens and triggers its respective ignition device to produce the artificial light.

If it is desired to ignite the contents of only one reservoir, or of a pair of reservoirs for instance, of the battery, the connexion between the operating rod, N , and the reservoir or reservoirs to be cut out is removed by loosening the set screw, N^2 , which removably connects the trigger to the rod.

Our Editorial Table.

THE "UBIQUE" CAMERA.

Manufactured and sold by Perkin, Son, & Co., Limited, 99, Hatton garden, E.C.

THE well-known Optimus house sends us a book of instructions for the Ubique camera, a clever little hand-and-stand instrument which we reviewed in our columns some time ago. Many of these cameras are in use, and the descriptive pamphlet can be obtained free by post on application.

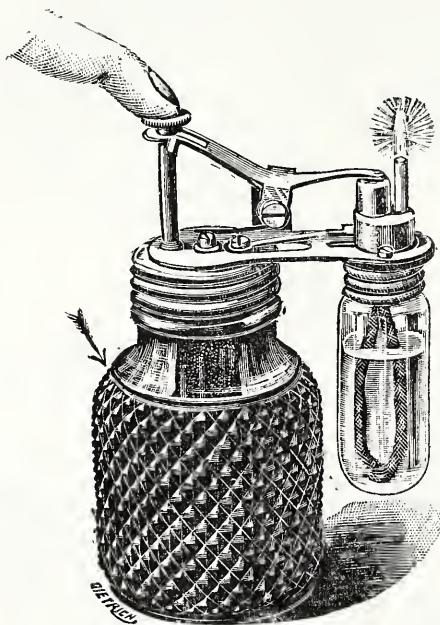
It may be added that the special features of the Ubique camera are that, in addition to being essentially a hand camera, and capable of taking snap-shots at any moment by merely pressing a knob, it can also be used on a tripod for all general photographic purposes, and is absolutely self-contained.

Campbell's Photographic Exposure Note Book is the title of a neat and conveniently arranged little book for recording particulars of exposures made. It is prefaced by thirty-six pages of formulæ, and space is provided for memoranda. It is published by Messrs. Duncan Campbell & Son, of 96, St. Vincent-street, Glasgow.

THE "RAYMENT" SELF-LIGHTING LAMP.

Supplied by A. Rayment, 125 Farnham-grove, Forest Gate, E.

This ingenious little contrivance is a combination of a bichromate bottle battery with a lamp. The heat generated by the electric current in the former is utilised to incandesce a spiral platinum wire placed over the wick of a volatile essence lamp, which is lighted up at any moment by the simple pressure of a lever arranged to complete an electric circuit. On discontinuing the pressure after the lamp has lighted itself, a spring comes into action which automatically breaks the circuit and so economises the battery, which will last for months and may be recharged for two or three pence. A charge of bichromate salts is sent out with each lamp, as well as explicit instructions. Two-pennyworth of mineral essence from the nearest chemist will be sufficient to feed the light for thirty hours, and is all that is required to complete the outfit. This lamp is capable of being made an extremely useful one to the photographer, whether amateur or professional, for many purposes; for instance, when in the dark room the ruby lamp, prior to development, is often found to give insufficient light to enable the operator to find his bottles, or to pour into



the measure the exact quantities necessary for each. Then, by pressing a lever on the "Self-lighting Lamp" a light equal to a good candle is immediately obtained, thus enabling the labels on the bottles to be read. Extinguishing the light requires but a strong puff of air from the lips. After development, whilst the plate is in the fixing bath, covered by an inverted tray to exclude light, another pressure on the lever will again ignite the lamp and facilitate preparations for the next plate, and allow the examination of the negative. After work is finished the tiny lamp may be transported to the smoking-room, and the lever pressed to light the cigar or pipe. Later on, when the weary one rests his head upon his pillow, should his slumbers be disturbed, he has but to stretch forth his hand to the lamp, which he previously placed within reach on the table, press the lever and his apartment is at once illuminated.

The price, 7s. 6d., being small, should place the lamp within general reach. It is so simply manipulated, and its uses are so manifold that we have pleasure in recommending it to those photographers who wisely surround themselves with every convenience and comfort in their work.

FALLOWFIELD'S PHOTOGRAPHIC ANNUAL FOR 1900-1901.

Published by J. Fallowfield, 146, Charing Cross-road, W.C.

As thick as leaves in June are the pages of this very useful annual, for they reach the great total of 888. What the book does not describe and illustrate in the way of photographers' requirements is not worth having. In some prefatory Forewords—the photographic associations of Charing Cross-road are peculiarly conducive to the use of that very modern term—Mr. Fallowfield very properly says of his annual that, in comparison with the book issued ten years ago, it gives a clear and definite idea of the extraordinary advance photography has made, the one issued in 1888 being but 153 pages, whereas the present amounts to over 880—an advance of 727 pages in all. He also points out that the new additions to his stock are cinematograph and X-ray apparatus, and that there is a general elimination of all obsolete articles that have appeared in previous lists. In the mount, chemical, and lantern sections many novelties will be found. *Fallowfield's Annual* is one of the most valuable publications of its kind.

Studio Gossip.

THE non-return of photographs sent in answer to advertisements is a subject that seems to be causing some trouble amongst actors and actresses. The *Stage* of last week said: "Letters have reached me this week regarding the unbusinesslike conduct of certain managers, who fail to return expensive photographs sent by applicants for engagements. I wish I could advise my correspondents in the matter. Thousands of letters containing photographs pass through the office of this paper each week, and, when the enormous traffic is considered, I must say that the 'forgetful' managers do not seem a large body. Of course, it is a serious matter for a young artist to send out expensive photographs, right and left, with the chance of securing an engagement, and find that there is no engagement as a result, and that the photographs have been annexed. Perhaps some reader could suggest a remedy."

READY FOR THE EMERGENCY.—A morning contemporary tells us that the Sunday after the Ascot Meeting is generally regarded as marking the zenith of the river season. But last Sunday innkeepers were contemplating untouched chickens, boat-hirers sorrowed over unlet boats, and lock-keepers had leisure to recall other Ascot Sundays when you could not drop a pin into the water of the lock for the press of boats. But the clouds of morning gave way to brilliant afternoon sunshine, and those who ventured on the Thames had their reward. Among those who did venture, in a Canadian canoe, was a well-known American writer, whose navigation of an unfamiliar craft was watched by a party of friends. With them was a pretty actress from the Gaiety, with a snap-shot camera. Suddenly the man of letters capsized his craft, and disappeared in the Thames. In a moment he emerged. "Stay right there! Don't move!" cried the excited actress. "I must take your likeness!"

AN AUTOMATIC PHOTOGRAPHER.—At the Southwark Police Court, before Mr. Paul Taylor, a young man, who described himself as an automatic photographer at the seaside, made an application for a summons against his employer, the owner of the machine, for a fortnight's wages. The Magistrate: What kind of work do you do? The Applicant: I stand by the side of the machine and pull the string, and then I pack up the photographs in lead paper. The Magistrate: What sort of a machine is it? The Applicant: It is a machine eight feet high. It takes the pictures, and I do them up. The Magistrate: So that the machine does most of the work? The Applicant: Yes; but I have to look after it, and pull the string. The Magistrate: I suppose no skill is required for your share of the work? The Applicant: Oh, yes, there is. The Magistrate: Then I cannot assist you. My jurisdiction is limited to unskilled labour. You will have to go to the County Court. The Applicant, who looked very much crestfallen, then retired.

THE MERITS OF PHOTOGRAVURE.—Writing of the Berlin Photographic Company's work on Burne-Jones, a well-known art critic remarks that it is too late in the day to point out either the merits of photogravure for the reproduction of pictures, or the perfection to which the Berlin firm have carried that process. Etchings and engravings are but translations or interpretations, and it is only in the prints of distinguished artists like Mr. Hall and Mr. Frank Short that the personality of the artist does not obtrude itself. But photogravure is a mechanical process, and no other artist comes between the painter and the reproduction. The Hermitage, the Prado, and the National Gallery collections have proved how admirably the Berlin Photographic Company can reproduce or suggest even the colour, the quality, the richness of the old masters, and the plates after Burne-Jones show no failing off. There are about ninety of these plates, including the well-known portrait of the painter by Mr. Watts, and another by Sir Philip Burne-Jones. The selection is admirable, almost all periods have been borrowed from. Examples are included of the early water colours, of the most sumptuous of all his pictures, such as the *Laus Veneris* and *Le Chant d'Amour*; of the several decorative series, the *St. George and the Dragon*, the *Briar Rose*, and the *Perseus*; of the later works, of the portraits; in fact, the series could not be more representative. It is published both in volume and portfolio form, and Mr. Walter Crane has drawn for the cover the simplest and most effective design he has yet produced. Of the fine edition, published at 100 guineas, there will be but 200 copies, each signed by Sir Philip Burne-Jones; the ordinary edition, published at 50 guineas, will also be limited in number. The royalties are to go to the Burne-Jones Memorial Fund.

News and Notes.

THE annual visitation of the Royal Observatory at Greenwich will be held on Tuesday, June 26.

MR. E. J. HUMPHERY, of the Platinotype Company, is at present cruising in his steam yacht in the North of Scotland.

THE "DAILY TELEGRAPH" WAR FUND.—On behalf of this Fund we have received 2s. 6d. from Mr. R. J. Dubbin, of Ballycastle, county Antrim.

THE death is announced, at Paris, of M. Dagron, who, during the siege, produced many thousands of micro-photographs for transmission by pigeon service.

THE Alpine Club has an exhibition of photographs, consisting of views taken by Signor V. Sella and Mr. E. Garwood during the tour of Kanching-ga, organized last year by Mr. Douglas Freshfield.

THE NEWCASTLE CONVENTION.—In addition to the papers already announced to be read at the Newcastle Convention, there will be one on the subject of "Desiccated Dry Plates," by Mr. E. Howard Farmer.

LONDON AND PROVINCIAL ASSOCIATION.—On the 28th inst. the Annual General Meeting will be held for the election of officers and general business. Visitors are always welcome at the White Swan, Tudor-street, E.C.

PHOTOGRAPHIC SCHOOL AT MUNICH.—The Bavarian Government has co-operated with the municipal authorities to found a school for the study of photography at Munich. The course commences in October next, and the rector is Herr G. H. Emmerich, of whom all particulars may be obtained.

LONDON VISITORS TO THE CONVENTION.—Mr. Welford asks us to remind those who are thinking of making the journey by sea that the steamer leaves London at seven p.m. on July 7, and that, in order to make special arrangements, he must know definitely by the end of this month. His address is Warwick Lodge, 166, Romford-road, London, E.

THE LATEST APPLICATION OF ANIMATED PHOTOGRAPHY.—A contemporary states that it is proposed to utilise the cinematograph for representing machinery in motion. It is expected that in this way it will become a valuable auxiliary to trade in machinery, as buyers will be able to judge of the working of a machine from the mutoscope without seeing the thing itself.

The Council of the Society of Arts have awarded the Society's silver medal to the following readers of papers during the session 1899-1900:—To Professor W. Wood, for his paper on "The Diffraction Process of Colour Photography"; to Mr. Edwin Bale, R.I., for his paper on "Artistic Copyright"; and to Professor W. M. Flinders Petrie, D.C.L., for his paper on "A National Repository of Science and Art."

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, June 26, at 8, Russell-square, at eight p.m., "The Selection of Lenses with regard to photographic Perspective," by Mr. J. H. Agar Baugh. The Rev. F. C. Ambert, M.A., will read a note on "How to Ascertain the Conjugates of a lens without Calculation." The Exhibition of Photographs by Dr. P. H. Emerson will close on Saturday, June 30. The Exhibition can be viewed on presentation of visiting card from ten to four, Wednesdays ten to eight.

COMMERCIAL CHLORIDE OF GOLD.—At a recent meeting of the Photographic and Microscopic Section of the Franklin Institute Mr. Lyman F. Kebler gave an account of a series of examinations he had made of commercial samples of gold chloride, in which he had discovered a considerable difference in the quality of the various brands on the market. He said that, taking an estimated quantity of 100 ounces, the difference in actual value between the best and the worst would amount to over 150 dollars, and that between these two there were all grades of value.

THE Beverley Photographic and Sketching Society's Seventh Annual Exhibition of Photographs, Paintings, and Drawings will be held at Newbegin, Beverley, on Thursday, July 12, 1900. Several silver and bronze medals and certificates will be awarded as prizes. The following are the photographic classes:—Section A (open): 1, Landscape and Seascapes; 2, Architecture; Portraiture; 4, Figure Studies. Section B. (Members only): 1, Any subject. The Judges are Messrs. A. Keighley, F.R.P.S., and P. Sheard, official Judges of the Yorkshire Union of Photographic Societies. All entries and other communications to be addressed to the Hon. Secretary, Mr. T. J. Torley, Toll Gavel, Beverley.

A BRILLIANT company assembled at the rooms of the Royal Institute of British Architects, in Conduit-street, on Monday evening, on the occasion of the opening meeting of the Society's Congress, when Mr. William Emerson presented Her Majesty's gold medal to Commendatore Rodolfo Lanciani, of the University of Rome. Owing to the unavoidable absence of Professor Lanciani, the medal was received on his behalf by Count Carrobio, Secretary to the Italian Embassy, who thanked the Society, not only for the award, but for the high compliment to his country. After the presentation a series of photographs, taken in Greece by the late Mr. Ernest George Spiers, were shown upon a screen, a full and graphic description of each being furnished by Mr. F. C. Penrose, F.R.S.

THE LATE SOLAR ECLIPSE.—A special joint meeting of the Royal Society and Royal Astronomical Society will be held at the apartments of the former at Burlington House, on Thursday, June 28, at 4.30 p.m., in order to receive preliminary accounts of the recent eclipse of the sun. Reports of the results achieved may be expected from the Astronomer Royal, Sir Norman Lockyer, Professor H. H. Turner, and others. The Académie des Sciences, Paris, has received and published preliminary reports of the eclipse a good deal in advance of the English Joint Committee. Most of these were furnished to the Academy at its sitting of June 5, and included one by the well-known lady astronomer, Mlle. D. Klumpke, who observed the phenomenon from a balloon in the environs of Paris.

KRUGER AND KHAKI.—At St. George's Hall last week Mr. Frederic Villiers, the well-known war artist and correspondent, gave an account of his experiences during the campaign in South Africa. Among the many excellent pictures, some 200 in number, thrown upon the screen, was one of the special correspondent of the *Daily Telegraph*, the Hon. S. R. Horsley-Beresford, who was the first to enter Ladysmith, Mr. Villiers, who arrived shortly afterwards, thoughtfully bringing with him some mutton for the famished defenders. A stirring account was given by the lecturer of the incidents that led up to the surrender of Cronje with 4000 Boers, and excellent pictures were shown of the ingeniously devised trenches and the entrances to the various underground burrows in which the enemy took shelter.

THE Photographic Section of the Great Eastern Railway Mechanics' Institution brought its winter session to a close on Wednesday, May 30, and at the conclusion of the lecture a clock and illuminated address, subscribed for by the members, were presented to Mr. H. W. Bennett, F.R.P.S., a mark of the high esteem in which he is held by them, and as a token of the value they set upon his services in the capacity of Instructor to the section. During the time Mr. Bennett has instructed, the membership has increased some seventy-five per cent., and this is undoubtedly due, to a very large extent, to the manner in which he has delivered his lectures, as he has given knowledge gained from his own vast experience, and that not in a grudging

way, but keeping nothing back, and is always anxious to make the matter under consideration as plain and clear as possible. The Section has now a lecture-room set apart for their use once a week, and a dark room, always open for the use of members and those of affiliated societies.

THE South London Photographic Society's Fourth Continental Excursion to the Rhine Valley and Ahrtau is on August 18 to August 27, 1900, under the leadership of Mr. William F. Slater, F.R.P.S. The following is the preliminary programme: Saturday, August 18, leave London 8.30 p.m. Sunday, August 19, arrive Remagen (headquarters), travelling via Hook of Holland and Cologne. Monday, August 20, Bingen by train, returning by boat, a ride of sixty miles through the finest Rhine scenery. Tuesday, August 21, Cologne by train. Wednesday, August 22, Drachenfels by boat. Thursday, August 23, Ahrweiler by train; walk seven and a half miles through the incomparable scenery of the Ahrtau to Altenahr; return by train. Friday, August 24, Bonn by boat. Saturday, August 25, off day. Sunday, August 26, start for home in afternoon. Monday, August 27, arrive in London 8 a.m. Estimated total cost, £7. 5s., which includes fares, hotel, and gratuities. Programme and full particulars may be obtained from the leader, Mr. William F. Slater, 5, First-parade, High-road, Lee, S.E.

THE SPECTACLE-MAKERS' COMPANY AND THE REGISTRATION OF OPTICIANS.—It may be remembered that the Worshipful Company of Spectacle-makers, of which the Master is Sir Reginald Hanson, Bart. (the senior member for the City of London), recently inaugurated a scheme for the examination and certification of opticians, with a view to assuring to members of the public an adequate degree of scientific knowledge and skill on the part of those who make a business of fitting spectacles. The examiners are Professor Silvanus P. Thompson, B.A., D.Sc., F.R.S.; George Lindsay Johnson, M.A., M.D., F.R.C.S., W.H. E. Thornthwaite, F.R.A.S.; and the Rev. J. Henry Smith, B.A. The following is a list of those who passed the fifth examination of the Company, held on the 28th, 29th, and 30th ult.:—F. Anderson, Elgin; H. B. De Brent, Beckenham; W. J. Bunt, London; R. A. Chadwick, Streatham; A. Charsley, London; J. R. Clarke, Newcastle; W. D. Eglington, Lewisham; A. E. Esdale, Liverpool; F. Fearnley, Leeds; J. J. Forbes, Stirling; S. H. Holroyd, Hull; E. W. Hovenden, Dulwich; H. A. Hughes, London; H. G. Husbands, Bristol; A. F. Ive, Worthing; J. W. Jones, Criccieth; R. P. Layfield, Liverpool; G. W. Lloyd, Sheffield; D. McFarlane, Manchester; C. Palmer, Gloucester; R. J. Scott, Waltham; W. Shelton, Stockport; G. Vogt, Kendal; J. B. Williams, Putney; W. Wood, Melbourne; A. V. Woodward, Derby. The total number of certified opticians is thus brought up to 296.

Commercial Intelligence.

REMOVAL.—Mr. Wilfred Emery gives notice of removal from 8, Dyne-road, Brondesbury, to new works at Anson-parade, Cricklewood, London, N.W.

THE old-established house of Morley & Cooper, 70, Upper-street, Islington, N. has just issued a new illustrated catalogue of cameras, lenses, and accessories.

THE Ozotype Company, of 1, Weedington-road, London, N.W., inform us that the materials for working the Ozotype process of carbon printing will be ready for the market on July 1 next.

KLAY'S MULTIPLYING PLATE-HOLDER.—Mr. George Jobson, of Adin-villas, Boston-road, Horncastle, writes us that he is sole British agent for this multiplying back, referred to in our Answers to Correspondents column last week.

THE AUSTIN EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. Charles Wilcockson, 184, Horton-grange-road, Bradford, for his negative, *Gill Beck Waterfall, Keighley*.

KODAK (LIMITED).—The Directors have declared an interim dividend on the Company's preference issue for the quarter ending June 30, 1900, at the rate of six per cent. per annum, and on the ordinary shares at the rate of ten per cent. per annum for the same period, which dividends will be payable on or after the 30th inst. They have further resolved that the transfer books be closed from the 20th to the 30th inst., both days inclusive.

THE WARWICK COMPETITIONS.—The following is the list of awards of the Warwick Competition for the current month:—10*l.* prize, H. C. Leaf, 2, Richmond-street, Totterdown, Bristol, *Playing Time*; 5*l.* prize, A. Waterall, Brighton-grove, Flixton, Manchester, *The Lullaby*; 1*l.* prizes, E. S. Baker, Photographer, 154, Bristol-street, Birmingham, *A Portrait*; W. Bell, 18, Nelson-street, Manchester, *The Road to the Sea*; Graystone Bird, Photographer, Milsom-street, Bath, *Innocence*; Philip Bulmer, 37, The Avenue, Sunderland, *Langdale Pikes*; E. W. Burch, Buckingham Palace-road, London, S.W., *Watering Horses*; A. Clarkson, Waveney-terrace, Ballymena, *Leaping Horses*; P. J. Coggan, 1, Carlyle-square, Chelsea, "Bravo! Baden-Powell"; W. E. Daw, Church-street, King's Lynn, *Eclipse of the Sun*; J. Day, 3, Denbigh-place, London, S.W., *A Sussex Mill*; Lewis Deacon, Manor Park, Lee, S.E., *Thatcher Rock, Turquay*; Michael Dillon, Ernest-street, Crewe, *Moreton Hall Courtyard*; L. J. Glendening, Pemberton-road, Harringay, London, *A Rest by the Way*; W. M. Graham, Holly-lodge, Stevenage, *Apple-tree in Blossom*; C. H. Heaton, Framlingham College, Framlingham, *Prefects, Framlingham College*; R. T. Marsland, Park-parade, Ashton-under-Lyne, *Outdoor Portraiture*; Colonel Orchard, Avenue-road, Stratford-on-Avon, *Girl Resting on Stile*; E. Simnett, Radnor-drive, Liscard, Cheshire, *Spring Flowers*; F. M. Steele, Custom House, Dublin, *Paris Exhibition, 1900*; W. E. Topping, 3, Albert-square, Belfast, *Horse Jumping*; H. V. Towell, Stony Stanton-road, Coventry, *The Mill Ford*.

THE Warwick Trading Company, of 4 and 5, Warwick-court, High Holborn, send us the following list of new war films photographed by their war staff now at the front in South Africa:—The Coldstream Guards leaving Bloemfontein: Showing this detachment of General French's column, both infantry and cavalry, on the march to Kroonstad; one of the prominent troopers passing before the camera is Mr. Burnham, the American scout. The C.I.V.'s March on Johannesburg: Showing this gallant regiment (which has cut a most prominent figure in the capture of Johannesburg) leaving Kroonstad for the march across the Veldt. The Coldstream Guards Cleaning their Rifles in Camp: Having just reached their camp at Bloemfontein after an engagement, these troops are seen busily engaged cleaning the dust and smoke from their guns. An Interrupted Game of Nap in Camp: Another one of the series of side lights of our troops in South Africa, showing a group of players seated on the ground in front of a tent, evidently reaching a most exciting period of the game, when they are interrupted by the appearance of an officer who commands them to stop the game and disperse the crowd of onlookers. Naval Gun Crossing the Vaal River Drift: One of the of the most interesting of all the South African war series, showing a 47-inch naval gun and transport being drawn across the drift by ox teams, which splash through the water and tug at the heavy gun in crossing; as the gun descends the steep embankment of the river, it is held back by ropes in the hands of scores of troops. A Siege Gun and Transport: This subject shows a 5-inch howitzer siege gun and transport (which played such havoc with Cronje's army) being drawn up a hill by ox teams, which are urged on by the dexterous handling of the long whips in the hands of native drivers. Boer Prisoners under Escort: The prisoners shown in this subject were captured by Lord Roberts' army during their march on Kroonstad; they are seen leaving the camp, being conducted by a mounted escort on their way to Bloemfontein; the two prisoners in the carts are field cornets; as they all pass closely by the camera, every face is recognisable, all of them wearing a most dejected look.

Patent News.

THE following applications for Patents were made between June 5 and June 9, 1900:—

- EXPOSURE MACHINES FOR ROTARY NEGATIVES.—No. 10,282. "Improvements in Exposure Machines with Rotary Negatives." Complete specification. H. LOESCHER.
- OPTICAL PROJECTION.—No. 10,364. "Apparatus for Projecting Theatrical Performances on a Screen." Communicated by C. Assi. O. IMRAY.
- ANIMATED PHOTOGRAPHY.—No. 10,412. "An Improvement for Moving the Film on a Lifeograph or Animated Picture Machine." W. F. HURNDALE.
- ANIMATED PHOTOGRAPHY.—No. 10,428. "Improvements in Apparatus for Taking and Displaying Photographs of Moving Objects." P. A. THOMAS.
- TRIMMING PRINTS.—No. 10,468. "Improvements in Patterns for Trimming Photographic Prints." F. O. JUNGE.
- CAMERA.—No. 10,586. "A New or Improved Camera, more particularly intended for use in connexion with Architectural Photography, for Measuring Angles." Complete specification. E. MILNER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
25	Southampton	Combination Printing. Max Mills, jun.
26.....	Birmingham Photo. Society ..	Composition. C. T. Cox.
26.....	Hackney	Skiagraphy. Dr. Burton.
26.....	Royal Photographic Society ..	The Selection of Lenses with regard to Photographic Perspective. J. H. Agar Baugh.—How to Ascertain the Conjugates of a Lens without Calculation. Rev. F. C. Lambert, M.A.
27.....	Southsea	Paper: Methods of Control in Photographic Printing.
28.....	London and Provincial	Annual General Meeting.
30.....	Ashton-under-Lyne.....	Excursion: Lincoln. Leader, Dr. Alex. Hamilton.
30.....	Borough Polytechnic	Excursion: Round Lingfield (Walker Miles). Leader, E. S. Taylor.
30.....	Croydon Camera Club	Excursion: Wimbledon Common. Leader, Mr. Kough.
30	Croydon Microscopical	Excursion: Reigate. Leader, Mr. Ballock.
30.....	Liverpool Amateur	Excursion: Moreton Old Hall, Congleton, and Dane Valley. Leader, Dr. J. W. Ellis.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 14.—Mr. J. E. Hodd in the chair.

Mr. W. T. WILKINSON passed round some photo-micrographs of a collotype plate showing the grain magnified about 150 diameters. The normal and other grains were shown in this way for comparison, and it was stated that an extension of camera of about eleven inches, with a one-inch power, was used.

Mr. T. E. FRESHWATER thought the examples were very interesting, as

giving so clear an idea of the nature of the collotype grain and its beautiful regularity. Personally he had not seen photographs of this subject before, and he was glad to have had the opportunity.

Mr. E. T. WRIGHT (Hon. Librarian) read an amusing paper based upon his experiences of the photographic amateur from behind the photographic counter. It appeared that in his initial form the amateur photographer was a peculiarly unreasonable person, one who expected the dealer to be as rich in explanations and as capable as an Encyclopaedia. He was always asking questions and propounding impossible problems, the commonest perhaps being, What is the best developer? What are the best plates? One imaginative camera man came forward with an offer of heaps of old negatives, which he thought might be recoated, and was surprised to meet with a rebuff. There is a class of amateur which is continually going wrong, and coming up with tales reflecting upon the inefficiency of apparatus and materials. Of these Mr. Wright had several anecdotes to relate; one fired off a dozen plates and got no results, it being ultimately found that the dust cover of the lens had not been removed. In another case the amateur had been startled to find some red stuff on the backs of his plates, until, remembering that there had been a recent case of scarlet fever in the house, he deduced therefrom an idea that the epidemic had in some way affected the plates, which, needless to say, had been backed to prevent halation. Others have no idea of what a backed plate is, or what it may be for. An instance, vouches for by the reader of the paper, where backed plates had been exposed back to front, was related. Of course, no image was found to develop; but these and many other trifling things constantly form obstacles in the path of the amateur, and he as often brings them up to the dealer for explanation. The inverted image given by a lens on the ground glass was attributed by one customer to carelessness in mounting, and he thought that Dallmeyer, the maker, should have been more careful to see that lenses mounted upside down were not sent out. Possibly it was the same man who thought that it would strain a lens to stop it down too much. The chemical side of the question is sometimes very funny. Eau-de-Cologne developer has been asked for in place of hydroquinone, and similar distortions of names daily occur. Everything taken into consideration, however, the lady amateur gives as much trouble and embarrassment as any of the genus amateur.

In the discussion which followed many other cases were quoted, amongst them that of the man who brought back a registering printing frame with a complaint that, after being out in the sun with a negative and paper for a whole day, the indicator had not moved a hair's breadth.

PHOTOGRAPHIC CLUB.

JUNE 13.—Mr. H. M. Hastings in the chair.

The evening was devoted, according to custom, to the display of the slides sent in for exhibition at the Convention meetings. A large number of slides were passed through, and a special committee sat in judgment upon them, and performed the duties of selection. The average quality was very good, and it was considered that visitors to the Newcastle Convention would have presented to them an interesting miscellaneous series.

FORTHCOMING EXHIBITIONS.

1900.

- July 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.
- August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
- October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- November 12-17 Ashton-under-Lyne.
- ," 21-23 Hackney Photographic Society.
- 1901.
- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE SOLAR ECLIPSE.

To the EDITORS.

GENTLEMEN,—I send you a few prints of the above, taken recently, which may prove interesting, not from a strictly scientific point of view, but simply as showing what can be done, with an every-day outfit, as a remembrance of an interesting event. The prints show the photographs

as actually taken, and also enlargements from the negatives obtained. These latter are only about seven times the diameter of the others, and yet required the easel to be placed 7 feet 4 inches from the nine-inch enlarging lens. The only apparatus used was a quarter-plate camera on stand, a 5×4 lens divided, giving about eleven inches focus, Imperial ordinary plates, and a Thornton-Pickard time and instantaneous shutter. The shutter was set for its fastest, i.e., one-ninety second, and remained so all the time; the stop was $f\cdot64$ to start with, going to $f\cdot22$ at maximum, and back to $f\cdot64$ as the moon cleared off. Owing to clouds, the first exposure could not be made till 3.23; indeed, most of the exposures, except towards the end, had to be made not systematically, but as break in the clouds permitted, and some very beautiful combinations of eclipse and cloud effects were obtained. I made ten exposures altogether, but one plate, owing to some mistake, did not get exposed; but, to compensate for this, I got two results on the next plate, as the enclosed print shows. This, also, was unintentional, but it proves one thing, i.e., that several results can be got on the same plate, the interval between the two sent being three minutes, the shadow of the moon having perceptibly moved during that time. The temperature decidedly fell as the eclipse progressed, and the clouds formed in about corresponding ratio, dispersing rapidly towards the end.—I am, yours, &c.,
Croydon.

J. H. BALDOCK.

[We are much obliged to Mr. Ballock for his letter and the accompanying photographs, which, as he points out, are of interest as showing how useful ordinary photographic apparatus may be made in obtaining interesting records of celestial phenomena. One of our leaderettes this week is devoted to the subject of star photography with an ordinary camera.—EDS.]

THE ACTINIC POWER OF THE LIGHT ABROAD.

To the Editors.

GENTLEMEN,—As a traveller who is also fond of his camera, I observed with some interest in your ALMANAC for 1899 (p. 1082) a reprint of what is styled "Colonel Stuart Wortley's Exposure Table," professing to give the results of "some careful tests of the different qualities of light in various places." Twelve items are formulated from observations chiefly made on the Pacific Ocean, and in adjacent lands thereto, all being compared to "the light of a very fine English day," rated (arbitrarily, I suppose) at 750 points.

If the quality of light really varies intrinsically in various places, such a table, properly constructed, would be very valuable to the photographic wanderer; but, unfortunately, in this table we are left in the dark as to the season of year, local weather conditions, and the time of day under which the observations must necessarily have been made, and we can hardly take it that Colonel Stuart Wortley has by some means or other eliminated all these disturbing factors, since he specifically says, in regard to Tahiti, "in early morning," and his English standard lacks absoluteness.

I have personally photographed in eleven out of the thirteen places he names, and have consequently gone through his list with rather more than usual attention. The conclusion I have come to is that this exposure table does not record "careful tests of the different quality of the light in various places," but rather the intensity of the sunlight at various places at various seasons of the year, the procession of the seasons being, in a sense, modified by Colonel Wortley's own movements.

To arrive at this result I have thrown out of this list five items, retaining only those which refer to the Pacific Ocean at sea level.

I will not trouble you with the full diagram upon which I base my conclusions, but the main data, outside Colonel Stuart Wortley's own figures, I give briefly in a footnote.

It seems highly probable that, after making an observation in its harbour, Colonel Wortley left San Francisco on a mail steamer early one December. At, or near, Honolulu (seven days out) he made a second observation, showing the power of the light there to be somewhat stronger than at San Francisco. His next observation was made at sea in latitude 16° S., probably near Samoa, the result obtained indicating, when considered in relation to the other figures that the sun was at that time about a fortnight from its summer solstice (Southern hemisphere).

Arrived at Auckland (twenty days out), the traveller would seem to have visited Tahiti, taking on his way his maximum recorded observation in 28° S. lat., as well as one on the island itself, the latter apparently about the middle of January. Later on he would seem to have made an observation in Sydney, probably during the March following.

In writing this I am, of course, assuming that Colonel Wortley made his observations under similar conditions, so far as time of day, aspect, state of weather, &c., are concerned.

You will, I trust, see, gentlemen, from these few remarks that more valuable figures than these of Colonel Wortley might have been obtained by a resident in San Francisco (or, for the matter of that, indeed, in Great Britain) who was willing to let the sun do the travelling.

Reliable and fully recorded observations at sea level in various parts of the world would, however, be highly desirable if there is any doubt as to

the intrinsic power of the sunlight (apart from season, &c.) in "various places," and, since a Frenchman on this boat lent me your ALMANAC, yours might well be the cosmopolitan influence to set such a scheme afoot.—I am, yours, &c.,

W. A. BOORD.

Ss. Polynésien, lat. 43° S., approaching Albany.

DATA.

Approximate latitude.	Approximate latitude.	Steam travel from San Francisco.	Steam distance from San Francisco.
San Francisco (38° N.)	Honolulu (21° N.)	7 days	2100 miles
Honolulu	Samoa (14° S.)	15 "	4379 "
Samoa	Auckland (37° S.)	20 "	5940 "
Auckland	Sydney (34° S.)	25 "	7224 "

W. A. B.

ORTOL.

To the Editors.

GENTLEMEN,—Your correspondent, "Tippoo," who writes from India in your issue of to-day, has evidently fallen on the same trouble which I had with ortol. My difficulty and the cure were related at page 639 of your volume for 1898, and I have no doubt that a similar procedure would be satisfactory, if it be possible. But I did not find any great advantage from ortol, and the fact that it does affect the hands in many cases is against its use—I reverted to the old pyro. Now adurol seems to offer a considerable gain, and my present experience with Schering's form is that it will give me a developer as good as pyro, while free from its troubles.—I am, yours, &c.,

J. F. T.

June 15, 1900.

DARK-ROOM LIGHTS.

To the Editors.

GENTLEMEN,—I see in your issue of Friday last that at the London and Provincial Society the Chairman expressed himself as dissatisfied with the ruby light, and appeared not to have met with a satisfactory substitute. Like him, I too cannot work with any comfort with a ruby light, but I have adopted what is, I believe, known as double flashed orange, and find it perfectly answer for very rapid plates. I have used it for Imperial flashlight plates (H. & D. 350) without any fog while I have abundance of light for work; my side light too is a single flashed orange.

Examination with a spectroscope shows that, while the orange glass passes a little green light, it seems to cut off entirely the blue which is transmitted by ruby glass; moreover, owing to the colour of the light, one can work with the lamp lower than with ruby, and still have clearer vision of what is going on.—I am, yours, &c.,

J. F. T.

June 18, 1900.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

J. E. Vatey, Wadebridge, Cornwall.—Photograph of the Commercial Hotel, Wadebridge.

J. Whyte, 37, Jamaica-street, Glasgow.—Photograph of Samuel Chisholm, Esq.—Photograph of Rev. W. Ross Taylor, D.D.

W. R. Jones, 36, Cowbridge-road, Canton, Cardiff.—Photograph of boy with "Echo" placard, "Mafeking Relieved, Official Message."

J. A. N.—Address Mr. J. C. Stevens, King-street, Covent Garden, who would probably undertake the commission.

W. TULLY.—The large print is apparently a collotype, the small ones bromides. Messrs. Morgan & Kidd, Richmond, London, S.W., and other firms undertake the work.

TESTING MOUNTS.—A. C. COURVY. We do not undertake the testing of mounts for our readers. If we did, we should not have much time to spare for anything else. You can easily test them for yourself by any of the simple methods that have recently been given in our columns.

SPOTS ON PRINTS.—T. BIGNOLD. The spots are clearly due to particles of pernicious matter, and, from the data you give, we should say from the water coming through rusty iron pipes. The only remedy is to filter the water before using it. We should recommend you to get a Birkenfeld filter. That filters rapidly, and can be attached to the water pipe. Possibly the water company have been putting down new mains in your district. When that is done, the water is often charged with iron rust for a time.

LIEUT.-COLONEL GUBBINS—1. The only suggestions we can offer are either that the balsaming medium is very much discoloured, or that some slight displacement of the combinations has taken place. 2. We have seen some very good work produced with No. 1. If you write the agent, he would probably let you have one on approbation.

MAKING OWN PLATES.—B. says: "I do a large cheap business, and have to cut things very fine. I sometimes use several gross of plates a week. Do you think, under these circumstances, that it would pay me to make my own plates?"—We should say, taking all things into consideration, that it would not, and that it will be much more profitable for you to continue to purchase them as hitherto.

DETERIORATION OF PAPER.—T. BOWER. All the packets of paper are like the piece sent, it is worthless. It has become spoilt through long keeping. If you only bought it a week ago, you should return it to the dealer from whom you had it. Evidently it is old stock, and must have been on the dealer's hands for a long time. It is no use expecting to get good prints on such paper by any treatment.

REMOVING BACKING FROM GLASS POSITIVE.—C. & J. say: "We have a glass positive to copy, and the black varnish at the back is cracked all over. We have tried to clean it off with benzole, as we have done before, but it will not dissolve. The picture has been hanging for many years on a wall?"—Evidently the bitumen (base of the varnish) has become insoluble, and you will have to scrape it off with a knife. You will find that it can easily be removed in that way.

STUDIO LIGHT.—THOMAS DAY writes: "I have bought a studio 19 x 11 feet, span roof. There is about seventy square feet of glass upon each side of roof, and about sixty square feet down one side. A friend of mine informs me that I have too much light in the studio. If this be so, please say how much glass I am to board up. The side light is facing north-east."—Cover up about four feet six inches at either end, top and sides, permanently, and fit blinds or curtains to the other portions.

A QUESTION OF REPAIRS.—S. R. J. says: "I rent my place on a repairing lease. During the heavy thunderstorm we had on Monday the hailstones broke several large squares of glass in the roof. Who must make them good? The landlord says it has nothing to do with him, and I say that damage done by hail is not fair wear and tear, and therefore he is liable."—You will have to repair the damage, as it is no concern of the landlord's whether the glass is put in or not, and you have covenanted to keep the premises in repair. It is unfortunate for you.

LENS FOR CAMERA; CHARGES FOR WORK.—E. W. writes: "Have bought 22 x 18 enlarging camera, kindly say what would be the most suitable lens to use. 2. Have taken up landscape and architectural photography professionally, what should I charge for first-class work, whole-plate and half-plate?"—1. Any lens that will cover the largest-size negative that has to be enlarged from. The size of the camera makes no difference in this respect. 2. Prices vary so considerably with different people that we can offer no advice. Much depends upon the character of the work and its artistic merits.

OVER-EXPOSED NEGATIVES.—W. C. JONES writes: "During my Whitsun holidays I exposed about five dozen plates. I have developed about a dozen of them with the ordinary pyro-ammonia developer. They came out quickly, and soon got dense-looking, but when they were fixed they were very thin and apparently fogged. Can you tell me how to get better density in the others? The plates are —'s most rapid."—The plate sent is very much over-exposed. In the development of the others increase the proportion of bromide and pyro, and decrease that of the ammonia. You may then get better results. See leaderette on the subject last week.

SENSITISING CARBON TISSUE.—CARBONENSIS asks: "Can you help me in this matter: I sensitise my own carbon tissue, using one ounce of bichromate to the pint of water, and give three minutes' immersion. When it has been in that time, I find the surface cannot be touched with the fingers without the coating coming off. I have never had this trouble before, but this is a new lot of tissue?"—This is a hot-weather trouble. The sensitising solution is too warm, so that the gelatine becomes much softened. Place a little broken-up ice in the solution, and handle the tissue as little as possible. By the way, a five per cent. solution is a little strong for this hot weather. A three and a half per cent. one would be better.

STUDIO BLINDS.—G. Y. writes: "1. Kindly advise me what sort of blinds to use in a new studio with north-east light, also best way to put them up. The studio is 22 x 12 with 15 feet glass lop side. 2. Also, is there anything that will remove liquid ammonia, 880 off the brasswork off a 10 x 8 R.R. lens?"—1. Light green, or dark blue, would be a suitable colour for blinds in a studio of this aspect. Fix the blinds on rollers for the roof. Spring rollers are the most convenient. For the sides we should have curtains of the same material, running on rods. 2. We are not quite sure we understand this query. Do you mean that the ammonia has removed some of the lacquer from the mount? If so, the only thing is to apply fresh lacquer.

DISCOLOURED NEGATIVES.—PUZZLED writes: "Can you inform me why negatives turn very yellow and sometimes orange colour during development? Several that I have developed lately have done so, and others have kept quite clear from it, although developed at same time and formula, viz., pyro and soda. Can you give me any clue to the cause of it, and also what will remove the yellowness? If so, I shall be glad."—As some negatives are yellow and others not, it is clear that the stain is due to the manipulations. Possibly the stained plates were kept a long time out of the developer while examining them. Insufficient washing after development and before fixing is proved to cause staining of the film. Try the clearing solutions given on p. 1085 of the ALMANAC; either of them will possibly remove the yellowness.

STAINED PRINT.—OPERATOR writes: "The enclosed is a badly stained print on paper, worked according to formula with every care taken in the various manipulations, washing, fixing, &c.; they seem all right until put on the enamel glasses, then spots begin to appear and continue to come up gradually same as enclosed print. I may state the collodion backing and gelatine have been tested and found all right."—The spots are due to something in the manipulations, and not to either the gelatine or the collodion. The only opinion we can hazard is that the print was imperfectly fixed, but there may be other causes.

CHARGE FOR PORTERAGE.—OPERATOR asks: "Will you please tell me what is the custom of the trade under the following circumstances? My employer sent me to take some 12 x 10 groups. When I got to the station, I found the place was three miles away. I paid a man three shillings to help me carry the heavy camera, with three double slides with the six plates, three lenses, &c., there and back. He refuses to refund the three shillings, saying that, if I did not choose to carry the apparatus myself, it was no business of his. You know the heat of last Monday."—We know of no rule in the matter, but such out-of-pocket expenses are usually paid by the employer without demur. Yours must be a very mean employer indeed.

COPYRIGHT.—H. N. RAINBOW writes: "A friend of mine had his photograph taken by a professional, and then went out to South Africa. He could only afford to distribute a few copies over a wide circle of friends who wanted them. I (an amateur) am willing to make small reproductions of it and give them round to our friends. I can also rely on my absent friend's willingness for me to copy it, but, on writing to the original photographers for permission, they refused. What I would ask is, Should I incur any liabilities by copying it under the above circumstances?"—In reply: Not if your friend paid the photographer for the photographs and you have permission to make the copies. If the photographs were not paid for, then the photographer can proceed against you for infringement.

COCKLED FILMS, &c..—S. A. C. writes: "I should be much obliged if you could give me a remedy for cockled films, sample which I enclose is by no means the worst of a dozen which I dried up by spirit (methyl)? I have tried the glycerine bath, also prolonged soaking in spirit, but cannot get the unevenness out, and, as they are, it is difficult to get contact in printing. Am anxious to get them flat again. (2) I should be glad to know the reason of them cockling, as I've never had it happen before? I gave them a short soaking in methyl spirit, and then laid them on blotting-paper to dry. (3) I notice in the News and Notes of your valuable JOURNAL that 'photographers are being enlisted for service in South Africa'; could you give me further particulars, or address where I could get them?"—1. Treat the films according to the instructions issued with them and then they will not cockle. 2. The reason of the cockling is that the soaking in the spirit has caused the gelatine to contract abnormally. Soak the films for an hour or two in water to which a trace of glycerine has been added, and, when they become flat, allow them to dry spontaneously. 3. Apply to the Recruiting Department. Any of the recruiting sergeants, who stand about the east end of the National Gallery will give you the desired information.

EXHIBITING SPECIMENS.—A. SURL writes: "Will you kindly inform me if legal proceedings can be taken to prevent me exhibiting an enlargement in any part of my shop? I have already removed it from the shop door window to oblige the father of the girl's whose photograph it is, although I had special permission from the girl and her mother at the time of sitting, and took an extra negative at the time for that purpose, with full explanations as to the size of the enlargement and where I should want to put it for show. Now, after going to the trouble and expense of making a picture measuring 45 x 35, I have been demanded by the father of the girl to take it from the shop; and, to save any unpleasantness between husband and wife, I took it out of the door window at five minutes' notice, and, instead of thanking me, the man threatened what he would have done had I not removed it when I did (namely, put his fist through it). Am I obliged to further remove it from the shop? This I don't want to do, I have given him the option of buying it at a reasonable price, as he hinted something about purchasing it. I should be glad of advice on the subject."—Certainly, legal proceedings can be taken and damages recovered for exhibiting the picture against the wish of the father. As its exhibition is objected to, you should remove it at once, or you may find yourself involved in costly proceedings.

STUDIO-BUILDING.—STUDIO writes: "I am about erecting a studio in my yard, but, unfortunately, it faces south, being shut in all sides by high buildings, near this position. 1. Can good work be done with such light and sun shining? 2. If so, would the sample of material I enclose be suitable with opaque blinds as marked on plan? 3. Would this be sufficient when sun was shining? 4. Or would it be better to have an extra set of thin white blinds, to diffuse the sunlight instead of leaving clear glass where light was wanted, of course stopping the bulk of the light with the green blinds where not wanted? 5. If this system of blinds is not suitable, what would you suggest? 6. Is the width about in proportion to the length (25 feet is all I can get)? 7. Is the height about right (12 feet back and 7 from eaves)? 8. Are the opaque blinds about in proportion? 9. If you have answered any queries before re south light, should be glad if you would give me dates. I have about three years' BRITISH JOURNALS. I have a number of books on studio-building, but all recommend and give instruction for north light."—In reply: 1. Yes, though requiring more skill than in a studio with any other aspect. 2. The colour is good, but we should recommend a thicker material. 3. With a thicker material, yes. 4. We should advise you to have ground glass in the roof of the studio; that will diffuse the light. 5. The system will do very well. 6. Yes. 7. Yes, but perhaps six inches or a foot higher would be better, considering the aspect. 8. Yes. 9. We suggest that you get Bolas's book on the subject, published by Marion & Co.

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EX CATHEDRÂ.

ALTHOUGH it was published just seven months ago, the article in our ALMANAC for 1900 on "Stereoscopic Photography" continues to bring us letters from readers who are interested in that fascinating branch of work. This week two correspondents send us communications which enclose some interesting stereographs. The first of these comes from Mr. C. H. Crosby, of Chicago, who kindly remits some slides commercially produced by Mr. H. H. Bennett, of Kilbourn City, Wisconsin, U.S.A. The peculiarity of these productions is that the models are little dolls posed against natural backgrounds. In one some nymphs are bathing, and a darkey boy is intruding upon the sacred spot; in another a doll figure has dropped her doll into the water, and is made to look distressed; in a third the legend of Peeping Tom of Coventry is illustrated with variations, and so forth. This idea, which, so far as we know, is original, can obviously be utilised to produce most effective and amusing stereographic studies. Doll models do not move, and can be easily posed in a variety of ways; while, if their

facial gestures are not excessively expressive, there is consolation in the reflection that this is a drawback not wholly absent from pictures of living models.

* * *

THE second letter is from a very old stereoscopic worker, who writes: "It is a long time since I had this pleasure. I think at that time I sent you some winter scenes, of which you gave a favourable notice in the JOURNAL. I now ask you to accept a few naturalistic subjects, and I may say that amongst all my extensive collections (thousands) of slides none seem to give such pleasure to old and young as these birds' nests, &c. There are many difficulties in this branch of photography. The young birds (and the old) won't sit quite still and look pleasant for a moment, and the wind too, by blowing leaves and foliage about, all helps to make the waste-glass heap grow, and often to get at the nests is very difficult. Wading for moorhens, and climbing trees for rooks and other birds, and wandering through miles of woods, is not always easy work, but the results obtained, great pleasure is given to friends, and on looking over the series I think there is full payment for the labour. Your article on stereoscopic work in the ALMANAC is much appreciated. I can now see slides stereoscopically without the scope. But, oh! the pain to my eyes if I look over many slides. I note by letters in the JOURNAL that I am not the only one who has the pain."

* * *

WITH regard to the pain caused by the examination of a number of slides without the stereoscope, we can only suggest that it is induced by the excessive width of separation given to foreground objects. If this were always kept appreciably under three inches, then we do not think any inconvenience would be experienced. The twenty-three stereographs which our esteemed correspondent is good enough to send are a tribute to his ability as a photographer and his acumen in turning stereoscopic photography to such very good account. They illustrate birds' nests in trees and hedges, bushes, grass, &c., and in securing the negatives a very great amount of skill and patience must have been expended. It need hardly be said that seen stereographically these slides are very beautiful to look at, the foreground objects in most cases being only a few

inches from the lenses. We thank both our correspondents for the opportunity they have given us of once more reminding our readers of the many wholly unique results which stereography enables the photographer to obtain.

* * *

A REUTER's telegram from Christiania tells that the Russian transport *Rurik* has arrived there, and reports that the Russian expedition for taking meridian measurements in Arctic regions is in good condition after wintering in Spitzbergen, and that the scientific results of it were very satisfactory; also that in the spring photographs of the Northern Lights were taken, and spectrum analysis observations made, and that the astronomical and physical researches were carried out systematically, the observatory being constantly at work. Most of us are as familiar with the old illustrations of the Northern Lights (*aurora borealis*) as with the old pictures of lightning. It is interesting to see how photographs of lightning differ from the representation of it in pictures, even those by the best painters, including those of modern times, notwithstanding what photography should, one would have thought, have taught them. Photographs will show how pictures of the *aurora borealis* differ from the orthodox depictions of artists. While on the subject of Polar expeditions, it may be mentioned that for the English one which is to start next year for Antarctic exploration a new ship, to be named the *Discoverer*, is being constructed by the Dundee Shipping Company, at a cost of 40,000*l.*. The funds for this expedition at present amount to about 90,000*l.*, towards which the Government have contributed 40,000*l.*, just the cost of the vessel. The funds will permit the *Discoverer* to remain in the Antarctic for two years, though the Committee are desirous that it should remain there for three years. This will require, it is said, another 30,000*l.*, and it is a question at the present time if this additional sum will be raised. The expedition is to consist of sixty persons all told, which include the names of Lieutenant R. F. Scott, R.N.; Lieutenant Charles Royds, R.N.; Professor Gregory, Melbourne University, as head of the Civilian Scientific Staff; Mr. T. V. Hodgson, naturalist; Dr. Reginald Keottlitz surgeon, &c. It is needless to mention that in this expedition, like the other just referred to, photography will be a feature. Indeed, no expedition nowadays would be complete without photography.

* * *

BIT by bit old London is becoming a thing of the past, and all that eventually will be left to show what it was will be photographs. Too often the taking of them is left until the work is in the housebreaker's hands, and the buildings are partly, if not wholly, hidden by hoardings or scaffolding. Newgate prison and the Old Bailey will soon be demolished, and those who desire to possess photographic records of the old buildings as they are should not delay in securing them. Neither of them are by any means picturesque, but they are interesting from the fact that they have been the scenes of the trials, and executions, of some of the greatest criminals of this country. Photographs of the interiors as well as the exteriors will be exceedingly valuable a few generations hence. Of course, permission to photograph the former will be required, and, as the red-tape formalities to be gone through to obtain it will take some time, we advise those of our readers who desire to secure photographs of the buildings, while they are intact, to lose no time in applying for the necessary permit. The

design for the new buildings, selected by the City authorities, is that of Mr. E. W. Mountford. It is somewhat of the Ionic order, and will be a totally different building from the existing ones.

* * *

SMOKE and smoking chimneys are often great nuisances to photographers. It is therefore satisfactory to see that photography is occasionally an avenger. A few weeks back we mentioned that the Hammersmith authorities had produced, as evidence in the Police Court, photographs of certain factory chimneys caught in the act of emitting dense volumes of black and offensive smoke, in contravention of the Smoke Act, and a conviction followed, the magistrate remarking that the evidence was indisputable. We notice, from a report in a daily contemporary last week, that the inspector at Bradford has followed the example of the one at Hammersmith, and produced before the magistrates a number of chimneys of the defendants at the time they were pouring forth dense volumes of black smoke. Such evidence is incontestable, and we shall be surprised if it is not more made use of than it has hitherto been. We have just said that such evidence is not contestable, but possibly some defendants may produce photographs showing the chimneys when they were not sending out smoke, somewhat after the manner of the Hibernian, who, after the evidence of witnesses as to seeing an assault, averred that he could call scores of witnesses who would swear they did not see it. In any case, photographers will benefit from a business point of view.

* * *

A FORTNIGHT back, it will be remembered, we referred to the objection made by the residents in the neighbourhood of Richmond to the site selected for the National Physical Laboratory in the Old Deer Park. This objection, it seems, is more general than we at the time imagined, for we see that a very influential deputation waited on Mr. Hanbury at the Treasury, on Friday last, in reference to the matter. The deputation, which included several members of Parliament, was introduced by Lord Balcarres, M.P. One of the objections raised to the present scheme was on the ground that the buildings would seriously impair one of the most beautiful views in the neighbourhood of London, and that it would also prevent any extension of Kew Gardens which may become necessary. Amongst further objections put forward was that the value of the land given to the public when Her Majesty presented the Queen's Cottage and grounds would be greatly injured if any building were erected in its immediate vicinity. In the end, Mr. Hanbury promised to carefully consider the views of the deputation; and so the matter rests for the present.

* * *

SILVER phosphate printing paper, concerning which some little stir has been made in the United States, recently formed the subject of investigation by the Technical Committee of the Photographic Society of Philadelphia. The report of the experimentalist to whom the paper was referred for trial is not favourable to this resuscitated printing method. This gentleman says: "The members of the Society will remember that, at a recent wall display, two of Mrs. Käsebier's pictures created considerable comment, favourable and otherwise. They were made (so we were told) by 'an entirely new process or emulsion'—phosphate of silver. Phosphate of silver is not by any means new as a sensitiser for printing papers. It was

ised early in the fifties. The present method is new only inasmuch as it calls for the use of an organic acid (tartaric or citric) in addition to the silver salt. In a recent magazine article upon the subject it was stated that 'It was made from silver nitrate, precipitated as phosphate by di-sodium-hydrogen phosphate (Na_2HPO_4). To this well-washed precipitate is added tartaric acid solution to form an emulsion. This is smeared over the paper with a tuft of cotton or sponge.' I made a number of attempts, but could obtain no emulsion. The silver phosphate dissolved to a clear solution. This is silver tartrate in solution, and free phosphoric acid." Equally unsatisfactory are the recorded experiences of the silver phosphate paper's behaviour in practice. The experimentalist proceeds: "When this paper is exposed under a negative we obtain a print. The paper was said to be a quick printer. It required, in bright sunlight, twenty-eight hours to make one print from a weak negative, and about a week from a dense negative. This printed all day, also all night! This paper was not sized, and the image was very much 'sunk in,' flat, and very poor. I thought sizing the paper might help, so I sized some with arrowroot, worked out a few more chemical reactions, made up some more solution, coated the paper, and obtained prints quite different from the first. They look like very poor ordinary silver prints—waste-basket prints. Some of my prints, when viewed by very bright transmitted light, are not so bad. So much for the paper coated by myself. I have some paper which I received from New York, and which acts very differently. This has been sized with albumen, which keeps the emulsion more on the surface. It prints with fair negatives in sunlight in from two to seven minutes. Some of it is unevenly coated, which accounts for the streaks in some of the prints shown. Some of the coating is on ordinary charcoal paper, which has a very nice grained surface, but is difficult to work without tearing, as it becomes very flimsy when wet. Personally I cannot see any advantage in the silver phosphate paper over any of the ordinary silver papers on the market. It does not compare with carbon, gum-bichromate, or platinum. The glossy surface is objectionable."

SITTERS AND THE PART THEY PLAY IN PHOTOGRAPHY.

IT seems surprising, considering the wide-spread interest now taken in photography, that there should still exist so much misconception on the part of sitters generally in regard to the important part they play when being photographed.

In the matter of dress, for instance, it is surprising what an amount of difficulty professional photographers have to cope with when dealing with the public generally, and they are often surprised at the ludicrous examples in taste, both as regards the colour of the garments worn, as well as the style laid before them for some particular class of photograph, such as full lengths, or busts, &c.

It would appear as if a very general opinion prevails among a large section of the public that a photographer now can make a good picture out of any material or coloured garment, and that many of the earlier strictures with regard to dealing with certain colours which did not photograph satisfactorily are no longer in force, and so, when Mrs. So-and-So happens to become the happy recipient of an elegant new gown, or other fashionable article of wearing attire, which just suits her so

nicely, of course, the first thing resolved upon is to be photographed, so as to appear to the best advantage, and then it falls to the lot of the professional photographer to produce a picture, it may be, out of a garment that, in respect of colour, is about the worst possible, or in a style of portrait that does not lend itself to the particular garment at all.

Others, again, when circumstances arise necessitating the requirement of a portrait being taken, pay but little attention to the matter of the dress that best suits them, or which is more particularly suited for the style they desire being taken in, and, just because Mrs. So-and-So had such a nice full length taken, she would like to be taken in that style also, no thought being bestowed upon the suitability of the style for the garments worn, or that one sitter may suit a particular style of picture better than another. In the choice of style gentlemen sitters are quite as often as great offenders against good taste as ladies.

Of course there are exceptions, and sitters are found who can discern between what would be a suitable class of picture for the particular costumes they are wearing, such as knock-about attire, or cycling, boating, or other special class of garments. Others, again, have the good sense to be guided by the photographer as to what would be the most correct kind of picture to adopt in such summer garments; but it is surprising how many sitters appear to have only one idea as to the style they wish to be photographed in, and, no matter what class of costume they are wearing, their one desire is a vignetted head and bust, a photographer often being driven to his wits' end to know how to persuade such sitters to select some more suitable style of picture. Then, again, in the matter of the wearing of hats or other head gear much ignorance is displayed, and it is difficult to get some people to understand that hats do not go well in a picture without any boots, and that they are generally worn out of doors, not inside, and also with other classes of head gear, which may be said to compose part of a costume, ludicrous effects are often desired by sitters.

It is well known that clever portraitists are often at their wits' end in devising alterations in the matter of dress as worn by their sitters, and not a few make bold enough to offer suggestions that necessitate the latter wearing borrowed plumes or garments, which they keep specially as a sheet anchor to meet some particular case with which they have to cope where some unsuitable article of dress, both in regard to colour and style, is worn. An example of this sort of thing may be cited in such an article as a light feather boa. A little consideration will show a photographer how much may be done with a garment of this description in the way of improving the appearance of a lady sitter. Take, for instance, the case of a lady who presents herself and asks to be photographed in a low bodice or evening dress. At a single glance the photographer notices first of all that the colour of the material worn is unsuitable, and also that the sitter's bust and neck, in vulgar parlance, are too scraggy ever to produce a pleasing result in the style desired.

Then comes into play his cleverness at *finesse*. Of course, it would never do at the very outset to pass any uncomplimentary remarks either as regards the dress or the physical condition or appearance of his fair sitter, but he can, by cleverly displaying one or two charming stock specimens, in which the aforesaid boa is so well introduced, eventually succeed in persuading the lady just to try it on, as it were, and then, by means of a little flattery when it is artistically entwined

around the neck and shoulders, and artfully displayed to cover up the scragginess, he will certainly have gained his point in more ways than one, and accomplished much to ensure a result that will afford satisfaction. In the matter of costume pictures, again, there are numerous other accessories and artifices known to clever operators that go far to please customers. We can well remember what a clever photographer (who has long since gone to his rest) did in bringing under the notice of his Scottish sitters a very handsome Highland costume specially kept for the purpose of this particular class of customers, who insisted upon full-length portraits in the most unsuitable dresses. "I have photographed that kilt thousands of times, 'he said,' and it's paid me weel."

It is, however, in the matter of wearing unsuitable colours that the public generally err most; and when it is borne in mind that a photographer is still practically powerless to pourtray in their true colour-values all the various hues met with in the different articles of ladies' attire, it will soon be evident that the more a sitter studies to appear in a dress that is suitable for photography, the better are the chances of satisfaction being experienced by all concerned.

No doubt every lady has a strong partiality for one, or, at most, two particular colours. These she looks upon as "*her colours*," and wisely so, perhaps, and makes a rule to adopt it in her wearing attire, simply because they suit her best. On the other hand, they possibly may be unsuitable for photography, for, when it is remembered that yellow, salmon-pink, and fawn all yield a greyish tint in the resulting photograph, and that light greens and blues yield white, while dark green and dark blue come out almost black, it is not surprising that disappointment often is felt at the results produced.

Then again, where a combination of colours is worn in a costume, a very wide range of different tints will result; hence it is evident that some thought should be bestowed in the selection of those colours that will best harmonise or combine well. White, grey, and black are looked upon as the most suitable tints for photographic purposes. The former will combine well with black or dark blue, or red or brown, simply because all these hues yield a dark tint in photography. Grey will be found to combine best with white or black, and black will combine equally well with light blue or light green or grey, simply by reason that these colours, as previously stated, yield a light tint.

It is, however, not only in the matter of colour that attention should be given to what is best to wear. There is, also, the question of the most suitable material.

Velvet has always been recognised as perhaps the best of all photographic materials, and it will be found to combine well with linen, lace, crape, and fur.

Silk, as a rule, does not combine well with linen, but cloth will generally be found to combine well with the same materials as velvet does. Fur will be found to combine with silk and lace, and many kinds of cloths and serges go well with silk. White calico will work nicely with linen and the different cloths.

Some consideration should also be bestowed upon several other equally important matters, especially that in regard to the manner in which the hair is worn. This is a matter that concerns every sitter in a marked degree, and, although, to a certain extent, will be dependent upon fashion where ladies are concerned, it, however, ought never be per-

mitted to interfere with one's particular individuality. Of course, clever portraitists have their own ideas in this matter, and, if left to themselves, might offer suggestions which would not meet with the approval of many of the fair sex. No doubt, however, a clever operator can take advantage of the style the hair is dressed in by so posing the head as will yield the most pleasing effects.

For instance, it is well known long drooping curls are best suited to a head in profile, and a fringe of hair can be made to suit certain kinds of foreheads, which would be out of the question with others.

One of the first things a portrait photographer has to get accustomed to is "disappointment." No one need attempt to try and satisfy every sitter that comes before him; and, strange as it may appear, it frequently happens that, by reason of an outrageous taste on the part of a sitter, the most satisfactory results to a photographer will often fail to please his clients, and to such an extent will this be experienced that there will be times when an operator feels so disheartened as to be inclined to throw portraiture overboard entirely. Such fastidious people, however, seldom get pleased anywhere, and this should be kept in mind by those who suffer such disappointment.

We know of one case in a group picture quite recently taken where a most excellent result was obtained in the case of over a hundred sitters. A schoolmaster found fault because the ends of his moustache were not sufficiently curled up. Operators, however, after a time, get accustomed to these little cranks on the part of their sitters, but they prove very annoying at the beginning of a career. All considered, portraiture is not the most pleasant branch of photography, and it takes a man with a more than usual amount of tact to cope with the many silly weaknesses on the part of both male and female sitters.

On the other hand, the world is not made up entirely of cranks or those who are seldom satisfied. There are reasonable and sensible people to be found, who know that sitters have their part to play in portraiture as well as the photographer, and it is a pity there are not more of them in the world.

Photography at the Royal Society's Soirée.—At the recent *Conversazione* of the Royal Society, Mr. J. Mackenzie Davidson, M.B., exhibited a stereoscopic fluoroscope, by means of which an observer is enabled to see the shadows cast by Röntgen rays on the fluorescent screen in stereoscopic relief. With this instrument a bullet, or needle, &c., can be seen in its true position, and its anatomical relations observed, and the surgeon can easily touch the bullet, &c., with a probe or forceps, while he is looking at its shadow on the screen. The position of a Mauser bullet in a leg of mutton was distinctly found by this means. The Eclipse Committee of the British Astronomical Association showed a number of interesting drawings and photographs of the total eclipse of the sun on May 28 last. A further number of photographs and drawings of the same subject were also exhibited by the Royal Astronomical Society and the Joint Permanent Eclipse Committee of the Royal and Royal Astronomical Societies. Professor Silvanus Thompson, D.Sc., showed some experiments on the aberration called "coma." Coma is an aberration due to the several zones of the lens not having equal focal lengths, and hence, when the lens is transmitting an oblique pencil, the unequal refraction of the different parts gives rise to a singular unilateral distortion of the cones of rays traversing the various zones. The actual path of the rays was very distinctly shown by means of a smoke box, which they traversed.

Reflective Power of Metals and Alloys.—In our issue for May 25th last we inserted a note as to the new alloy, magnalium, of Professor Mach, in which its great reflective power was mentioned; the following note, therefore, by Herren Hagen & Rubens, in the *Zeitschrift für Instrumentenkunde*, will be interesting. It gives the results of a long series of researches and the means of numerous measurements are given for various portions of the spectrum, 50 $\mu\mu$ apart.

REFLECTIVE POWER IN PERCENTAGE OF INCIDENT LIGHT.

$\lambda =$	450	500	550	600	650	700 $\mu\mu$
A.—Metals:						
Silver	90·6	91·8	92·5	93·0	93·6	94·6
Platinum	55·x	58·4	61·1	64·2	66·3	70·1
Nickel	58·5	60·8	62·6	64·9	65·9	69·8
Steel, hard	58·6	59·6	59·4	60·0	60·1	60·7
" not hard	58·3	55·2	55·1	56·0	56·9	59·3
Gold	36·8	47·3	74·7	85·6	88·2	92·3
Copper	48·8	53·3	59·5	83·5	89·0	90·7
B.—Speculum metals:						
Rosse	62·9	63·2	64·0	64·3	65·6	67·3
Brashear	61·9	63·3	64·0	64·4	65·4	68·8
Schröder I.	62·4	62·5	63·4	64·2	65·1	68·0
VI.	61·5	62·5	63·6	65·2	66·6	68·4
Brandes & Schünemann	49·9	49·3	48·3	47·5	49·7	54·9
L. Mach. I.	83·9	83·3	83·7	83·0	82·1	83·3
" VII.	83·4	82·5	82·1	83·8	84·9	84·4
" XII.	83·4	84·5	83·8	84·5	83·3	83·8
C.—Glass Mirrors:						
Backed with silver	79·3	81·5	82·5	82·5	83·5	84·5
" mercury	85·9	86·6	88·2	88·1	89·1	89·6
" amalgam	72·8	70·9	71·2	69·9	71·5	72·8

The composition of the different alloys are, in percentages or parts:—

- Rosse : 68·2 Cu + 31·8 Sn.
- Brashear : 68·2 Cu + 31·8 Sn.
- Schröder I. : 66 Cu + 22 Sn + 12 Zn.
- Schröder VI. : 60 Cu + 30 Sn + 10 Ag.
- Brandes and Schünemann : 41 Cu + 26 Ni + 24 Sn + 8 Fe + 1 Sb.
- L. Mach. I. : 2 Al : 1 Mg.
- " VII. : 1 Al : 1·5 Mg.
- " XII. : 1 Al : 1·75 Mg.

Recent Progress in the Aluminium Industry.—Under this title Prof. J. W. Richards, of Lehigh University, recently read a paper before the Franklin Institute, which gives an excellent résumé of the present state of the manufacture of this metal and its alloys. To give some idea of future possibilities, we may note that Prof. Lehigh estimates the actual cost of production as probably about twenty cents a pound, and its selling price thirty cents in the United States and twenty-five abroad. With prices so low as this, and with no probability of any increase—the reverse is more likely—it is somewhat singular that more use is not made of the metal than now is the case, especially in the construction and manufacture of photographic articles in which lightness is, in so many instances, of such prime importance. Still more striking is this when we remember that, bulk for bulk, aluminium, being so much lighter than brass or copper, actually costs less. Thus, brass and copper are set down as being fifteen and seventeen cents respectively per pound; but an equivalent bulk of aluminium—i.e., one-third of a pound—costs only eleven cents. It is true that the soldering is still a difficulty with this metal, and that cutting a screw thread is far less satisfactory than with copper; but these difficulties vanish when an alloy, instead of the pure metal, is used, and it is probable that it is an alloy of one kind or another that which will have the greatest future. The amount of material required for the purpose of alloy is remarkably slight; thus, Prof. Lehigh states that five per cent.

of copper makes a strong metal as rigid as bronze, but of only one-third its weight. If zinc replaces the copper, thirty per cent. is needed. He mentions specially the alloy made by the Delaware Metal Refinery, which is "a hard, white alloy, specific gravity 3·1, melts clean, runs fluid, makes beautifully sharp and perfect castings, turns and machines like the finest brass, polishes well, and, to conclude, is fully as strong and rigid as gun metal or the best of the ordinary bronzes." It is made principally of aluminium and zinc, and sells at the same price per pound as pure aluminium. The lecturer stated that it was largely used by Philadelphia firms, who were quite enthusiastic over its possibilities. With such strong *ex cathedra* utterances before us, we may justly anticipate seeing lenses in aluminium alloy settings quoted at the same price as brass, and camera fittings, tripod tops, and a host of other minor pieces of brasswork, all replaced by a light alloy, without any increase of cost, if not, indeed, at a cheaper rate than brass. Among other important uses of aluminium is that of making plates for lithographic printing, and already it is being very largely used. It is in some respects superior to stone, and possesses the inestimable advantage of being able to be bent into a cylinder, and thus allow of fast running in printing. It is replacing silver leaf for decorating. "Silver-edged" mounts may now be made which will not turn black with keeping, and the same may be said of "silver" printing with aluminium. It is capable, after rolling into sheets $\frac{1}{2500}$ of an inch thick, of being beaten out to $\frac{1}{70000}$ of an inch. Finally, we may say that, alone, or mixed with magnesium, it is capable of replacing that metal for flashlight photography.

Enamel versus Oil Paint.—The well-advertised enamel paints are well enough known, but the extent of their durability is matter for discussion. Recently the results of series of experiments, extending over a period of years, has been made public, and they are highly satisfactory. About 300 plates of sheet steel were carefully cleaned and freed from rust and scale, and then covered with three coats of the enamel or paints to be tested. One-third of these were sunk for two years in a fresh-water lake, another third suspended from a float in sea water, and the remainder in sea water in another region. The enamel paint stood the best by far, and those that had been baked were the best of all. A number of the plates were absolutely unaffected by their long immersion. It did not seem to matter much what pigment was made use of, with the one exception of red lead, which, in the case of the oil paints, proved the best. Professor Sabin explained the difference between oil and enamel paint. Oil paint is made with raw linseed oil, to which is generally added a "drier." Such a paint will "dry" in about five days; but, as that is an inconvenient time to wait, a "drier" is used, generally "boiled oil," i.e. linseed oil boiled with litharge and a little manganese oxide. In enamel paints the oil is replaced by a varnish made by dissolving a resin in a mixture of oil and turpentine. Enamel paint ought to be far superior to oil for the important purpose of painting studio lights, though the simple varnish itself is said to be superior to the mixture of varnish and pigment. It is, however, a question whether, for this purpose, the best compound would not be a mixture of varnish and linseed oil in the proportion, say, of three to one. Any tendency to brittleness would be mitigated, and we should have the advantages of both kinds combined. Another use for enamel paints is indicated by the report of their durability when exposed to water, i.e. coating of wood vessels to make them waterproof. A large porcelain dish is costly, but a light but tight-built wood dish or trough, painted three times with enamel paint, ought to be most useful for the majority of purposes, and would be kept in perfect condition by a periodical coat of paint. Professor Sabin measured the thickness of the films made by two coats of paint, and found it to be from $\frac{1}{250}$ to $\frac{1}{500}$ of an inch in thickness.

Photography of the Smallest Wave-lengths of Light Rays.—Professor Victor Schumann, after several years' interruption, has resumed his work in this direction, and in March

last read before the Imperial Academy of Sciences in Vienna a paper describing his latest results. For these short wave-lengths it is known that glass lenses and prisms are not available through being opaque to the rays, but fluor spar and quartz, not resisting their passage, is employed in lieu of glass. He finds, however, that the photographing of the short waves becomes increasingly difficult as the waves are reduced in length. A piece of quartz .5 inch thick absorbs nearly all the rays beyond 150 $\mu\mu$, while fluor spar acts in a similar manner, but up to 100 $\mu\mu$ is much more transparent than quartz, but it weakens in a striking degree all the more refrangible rays; for example, in only .5 mm. thickness it more than doubles the time of exposure. In using the Cornu quartz prisms, which are joined together by glycerine, he thought the latter might be opaque, and his investigations showed that "glycerine is not so indifferent towards the above-mentioned regions of the spectrum as it has been proved to be in the less refrangible red-violet, according to the investigations of Eder and Valenta. Two quartz plates cut perpendicular to the axis increased the time of exposure to the aluminium rays from 18 to 25, from 11.4 to 25, from .08 to 25, according as the wave-lengths became shorter. The introduction of glycerine caused an increase of the time thus: the 18 to 25 became 19.5 to 25, and the .08 to 25 became 17.5 to 25. It is only on the smaller of the ultra-violet rays that these obstructions were shown, with the coarser waves he was not able to observe that the glycerine .1 mm. thick produced any effect. It is, however, a just deduction from the above facts that, as Professor Schumann states, "it is evident that the most refrangible rays must be carefully dealt with in order to obtain their intensity undiminished."

Value of Pictures.—It is interesting to note the high prices, and sometimes low ones, that the works by leading painters realise at auction sales. One day last week four pictures by Sir Joshua Reynolds, at auction, realised the goodly sum of 11,000 guineas. They were portraits, and not of any very great notabilities, and it is tolerably well known that this class of picture, even by the most eminent artists, is not of the same value in the market as figure and landscape subjects. The portraits were of Mary Arundel, wife of the seventh Baron of Arundel; the Baron; Mary Conquest, wife of the eighth Baron of Arundel; and the Baron himself. All of them were in their peer's and peeresses' robes, and, being by Sir Joshua, it is scarcely necessary to say they are very fine pictures. Still, the price paid for them strikes one as being a little high, seeing that they were portraits. It would be interesting to know if these pictures had been valued by experts, and at what sum they were assessed. A little while ago we commented upon the fact that, at the sale of the Peel heirlooms, two pictures fetched, at auction, nearly four times the sum that experts valued them at if disposed of that way. Evidently the value of anything at auction sales, even photographic apparatus, is what it will fetch, and that is not a fixed amount.

JOTTINGS.

WELL-WISHERS of the Photographic Salon are, no doubt, grateful to the JOURNAL for having called attention to the fact that the "General Committee of the Photographic Salon," to whom exhibitors are invited to submit their work before it secures the very great honour of being hung, is mostly composed of dummies and dead-heads. The names of some of the foreigners must be absolutely unknown to the photographic "man in the street." For example: A. Alexandre, A. Buschbek, Hector Colard, A. Hildesheimer, R. Ladevèze, L. David, Otto Scharf, J. Strakosch, Carl Ulrich. So far as can be discovered, these men have no present-day connexion with British pictorial photography, and the aspirant for the much-coveted fame of an appearance on the walls of the Dudley Gallery may well ask who they are, and how they derive a right to act as London Judges of photographs. Again, besides several more of these superfluous foreigners, such men as Bhedwar, Eickemeyer, Stieglitz, Kieley, and G. H. James, live abroad, so that their inclusion in

Piccadilly Committee is not of much use. Moreover, it would be decidedly interesting to know what practical interest is nowadays taken in pictorial photography by J. S. Bergheim, Valentine Blanchard, R. Briant, B. Gay Wilkinson, Henry Van der Weyde, William Willis, Alfred Maskell, and others who might be named. My old opponent, the first Hon. Secretary of the Salon, I am informed, has given up photography altogether, but I suppose his name is kept on the list for the sake of appearances.

My point in this matter is, that the imposing list of sixty or seventy names which make up the General Committee of the Salon only exists on paper. I should run the risk of being charged with unpleasant personalities if I carried my analysis of the Committee as far as I might and could; but it will meet the needs of the case if I say that, of these sixty or seventy Committee-men, ten or a dozen only figure amongst the active administrators of the Exhibition. The remaining forty or fifty do not participate in the work of selection, so that the presence of their names in the list of the General Committee is a sham. The Salon is the only photographic Exhibition that I know of which is advertised by means of dead-heads and dummies. Such people have their uses only in that their names look well on a prospectus. A big list possibly creates an imposing effect in the mind of the would-be exhibitor. He, perhaps, pictures the General Committee as a great international conclave of pictorial photographers, turning up, to a man, at the Dudley Gallery, and laboriously "selecting" the exhibits. In fact, he not unnaturally supposes that all these people take some interest in the Salon Exhibition, and really trouble themselves about the matter. Not a bit of it. The General Committee is very largely a myth. The work of selection is done by a coterie of Londoners *plus* an occasional countryman. This is not a matter for blame or censure, and it probably cannot be avoided; but, in the interests of the exhibiting public, I decidedly think that the real state of things should be made plain on the prospectus. A man sending in a photograph to the Dudley Gallery does so on the virtual representation that it passes before a Selecting Committee of sixty or seventy men, or a Sub-Committee chosen therefrom. Why not let him know who are to be his actual judges or selectors—as is done elsewhere—and not mislead him by parading before him a long string of unnecessary foreigners and well-named supernumeraries who have no interest whatever in the Exhibition?

THE five-hundredth anniversary of the birth of Johann Gutenberg, the inventor of printing, has just been worthily celebrated at Mayence. The German press has extolled him as the Herald of the Modern Era, the man who contributed more than any one else to knock off the fetters of mediævalism, the forerunner of reformers, the liberator and awakener of the masses, the creator of the technical instrument which has been so mighty in battle for truth, liberty, righteousness, and one of the few who has made the world happier and better by his invention. A few years ago we should have called this sort of thing Americanese; to-day we accept it as a matter of course from a country where trumpet-blowing is part of the national education. The Gutenberg celebrations have set me wondering whether the memory of Fox Talbot will be honoured in a similar way when the age of photography comes to be reckoned by centuries. How many of us will be here in 1939 to join in any movement that may be made in honour of the great Englishman? The invention of printing types was, undoubtedly, a great thing in its way, but I am inclined to think that future historians will place paper photography, as devised by Fox Talbot, on a still higher plane of merit. Talbot was the first to show how a print from a negative might be made, and one need have no difficulty in tracing to that source all the wonderful, the fairy-like developments of photography that have since followed. But experience shows that it takes a very long time before really great inventions quite grip the popular imagination, and it is therefore fairly certain that nothing less than the celebration of a centenary of photography is needed to enlighten people at large as to the vast benefits which Fox Talbot's work has conferred on humanity.

THE dissociation of Mr. John Howson's name from participation in the management of the Britannia Works Company must not be owed to pass without recognition of the strong and prominent part which that gentleman has so long played in photography. For ten years "Howson" and "Ilford" have been names that have been inseparably linked together. The splendid energy which Mr. Howson always ungrudgingly expended in the interests of his Company has reaped a rich reward, and there is no doubt that the great plate and paper-making works at Ilford are to-day one of the most solidly established concerns in the trade. I am sure that, with whatever new enterprise Mr. Howson may elect to connect his future energies and fortune, will carry a large volume of good wishes with him. He and the Britannia Works Company practically revolutionised the plate and paper trade during the last decade; but it has been, I am firmly convinced, for the good of British industry and British photography. At the time when the Britannia Company came to the front it certainly looked as if the whole of the trade in plates and papers was likely to slip into Continental hands. Happily, such a state of things was averted, and to-day sensitive photographic preparations made in England compete in price and quality with the products of America and the European Continent. I hope it may always be so, although it is rumoured that within the next few years a determined attempt, backed up by practically unlimited capital, will be made to place the control of the English plate and paper trade in other hands.

IT WAS Mr. Gladstone who was credited with the faculty of extracting poetry out of figures. His annual budget statement ristled with dry-looking numerals, and yet it is said that the speechless orator could so present the meaning of the vast sums he dealt with to the minds of his hearers that he held them spell-bound by the demand upon the imagination which was made by a study of what was meant by the movement of millions of money amongst the people. Some of the great advertisers have evidently taken a leaf out of Mr. Gladstone's book. A tea firm tells you, for example, that its annual output, if packed in pound boxes, would reach twice round the world; a beef-extract house proudly boasts that it sends out so many millions of comforting cups a year, and so on. The imagination is compelled to play a large part in modern trade. I wonder if some of the photographic advertisers do not take the hint, and tell us how many square miles their output of plates and papers would cover. The figures would look good in print—and advertising space is so cheap. Only the other day Mr. Wellington, of Messrs. Wellington & Ward, told me that his firm had received an order for six miles of bromide paper forty inches wide! What becomes of the vast area of sensitive photographic surfaces annually sent out by the manufacturers? The mind reels at contemplating the tremendous amount of photographic printing that goes on in our midst. And yet there are some croakers who will have it that photography has seen its best days! I am firmly convinced that the halcyon time has not yet been reached.

PORTRAIT photographers, especially those who make a speciality of taking little children, might find use for the following hint: A friend of mine was recently presented by his wife with one of those little pledges of affection which create so much noise in the world in the early days of their arrival, and he was so pleased at the event that he made it public in the advertisement columns of his favourite newspaper. Then the postman became very busily engaged with the knocker and the bell at his front door. Quite an army of astute tradesmen made a note of his address and sent him samples of infants' foods, catalogues of baby-linen and perambulators, betting men's cards, loan-office literature, and other supposedly indispensable requirements of child-rearing; but, amongst the assorted collection of touting circulars, my friend tells me that no photographer thought it worth while to be represented. He seemed to think that having the baby photographed is looked upon in most families as an event of such importance that photographers miss many chances by not studying the birth announcements in the newspapers and, at a discreet interval, sending the parents a prettily got-up invitation to have the little one's "likeness" taken. There may or may not be

something in the idea; but here it is for those most concerned to adopt it or not as they may think fit.

STAGNATION governs most branches of industry just now. The cry is that the war is hindering trade, and a common topic of conversation is that matters will not mend until the Chinese and African wars have been followed by a General Election. There appears to be a strong feeling that an appeal to the constituencies will be made during the present summer and coming autumn. Five years ago, when the last election took place, many photographers profited by the opportunity to dispose of portraits of candidates, &c. The work of the camera is very considerably availed of in modern electioneering, and the photographer who during these dull times casts about him to see in what way he can turn things to account when a dissolution is decided upon by the ministry will not have expended the necessary forethought in vain. The publishing trade, I learn, suffers keenly from the war fever, which detaches men's minds from subjects upon which they naturally dwell in times of peace. Were it not for the wars, it is safe to say that the coming autumn would witness the output of a great variety of books dealing with the history of the century, which closes on December 31 next, and in the production of these books photographic and phototypic illustrations would be greatly availed of. It is reasonable to suppose, however, that a branch of photography—optical lantern work—which last winter was virtually wiped out, will, during the season of 1900–1901, regain its temporarily lost popularity. In this respect there is much ground to be made up. "When Johnny comes marching home" in his tens of thousands, he should give a much-needed stimulus to trade in general and the photographic branches of it in particular. Meanwhile, photographers will be well advised to keep an eye on the General Election, and the chances it may offer of increasing their businesses.

ONE or two extracts from a little article on business suggestions may be of interest to many professionals who are not too proud to learn and study the causes of other people's success. The writer, an American, advises his readers to "make it a point never to throw cold water on a customer's expectations by telling him that you really cannot give a definite promise as to when work can be finished, as though your inability to do this was proof of the popularity of your work, for no matter how good a thing is the public will soon cease to take any interest in it if it is not forthcoming when wanted. Explain the uncertainty of the weather if you are not using a developing paper, but tell definitely when the retouching will be completed, and convey the impression that your business is alive and that results will be forthcoming promptly." This advice, boiled down, means, in the jargon of the time, "Don't give yourself away to your sitter." The writer also relates how a photographer of his acquaintance obtained a splendid advertisement amongst his sitters by holding an invitation exhibition of his best work. The studio was thoroughly renovated and rearranged, so that to even old patrons it had a changed appearance. Abundant floral decorations enlivened the effect, and a small orchestra supplied appropriate music. The pictures, which were the centre of attraction, were arranged to the best possible advantage and grouped in accordance with their characteristic features. The proprietor, assisted by his chief operator, devoted himself to explaining how the various effects in lighting, posing, and printing were obtained, calling attention to the various styles of finish, mount, and framing, with a view of familiarising the public to as great an extent as possible with the possibilities of artistic photography, not only in the direction of cabinet pictures, which has come to be the standard and almost the limit of the public's appreciation of a photographer, but rather of life-size portraits, demonstrating the possibility of obtaining portraits which rival the effects of the painter at a price which seems extremely moderate when compared with the cost of an oil painting. In fact, the photographer held a kind of musical at-home, at which he constituted himself art-critic-in-chief of his own photographs! An astute notion, at any rate, and one that probably brought its own reward.

COSMOS.

B

LIGHT SCREENS.

A CURSORY examination of most opticians' catalogues which are now issued will at once show that almost every lens is advertised to cover with a small stop a much larger plate than it will with its full aperture; in fact, this is advanced as one of the great advantages of the newer forms of lenses which are now constructed. That this property is by no means confined to these new lenses is, of course, a well-known fact, but they have at least the advantage of covering a larger plate at a larger aperture than the old rapid rectilinear.

Whilst the word "covering" is used most generally, we think it would be far better to find some other term, which should express briefly what is meant, which is, of course, that the lens will define sharply over a given sized plate.

To the man who uses many different-sized cameras a lens of this character, which can be used indiscriminately as a narrow, a medium, and a wide-angle lens at will, is, of course, a great convenience, but it is an open question how many times a lens is thus used. The amateur worker is usually content with one camera; if he has two, he is frequently extravagant enough to have practically two sets of lenses. The professional, on the other hand, may thus use a lens because a complete battery of lenses for each camera means a locking up of capital which, possibly, the advantage in results does not warrant.

Let us assume, however, that a lens of this character is used, and we will take a specific instance. A six-inch anastigmat was purchased for a quarter-plate hand camera, and this was advertised to "cover" that sized plate with full aperture, a 5×4 with $f\cdot 11$, and a half-plate with $f\cdot 16$, statements which were sufficiently borne out on testing to need no special comment; but it was found that, when the lens was raised above the centre of the plate by three-quarters of an inch, there was considerable falling off of definition in the margins of the lower half of the plate, necessitating the insertion of a stop. This has been mentioned incidentally, as it is not the particular point to which attention is to be directed.

On placing the lens on a large camera, and stopping down to $f\cdot 45$, the circle of sharp definition was found to have a diameter of 9.5 inches, that is to say, the area of the circle of light was approximately 71 inches, and, as the lens was to be used on a quarter-plate, or on a circle the area of which would be approximately 22 inches, it is obvious that there is a great deal of light which is not only useless, but may be prejudicial, for, although the interior of the camera bellows is always black, the black is by no means that of lampblack, which, under the most favourable conditions, will reflect from 3.5 to 6 per cent. of the incident white light. It may be said, of course, that the corrugations of the bellows will stop the greater part of the light, and, whilst this is true, it is only necessary to project a strong parallel beam of light on to one side of the bellows to see how much light is visually reflected; and, as the dry plate is far more sensitive to faint lights than the retina, one can readily understand how this superfluous light may cause a general superficial fog. It may, of course, be advanced that this general fog can only be of such a slight nature as to in no wise affect the image, or, in fact, that it may be actually advantageous as assisting to overcome the initial inertia of the silver haloid, and thus give a more fully exposed negative, just as it is said an unbacked plate does. For those who believe in this statement their obvious course is to use unbacked plates and their cameras as now built, or, to carry the argument to its logical conclusion, to actually line their cameras with a stronger reflective material than that at present employed.

The destruction of this reflection by either the absorption of the whole of the light, which is an extremely difficult thing to do, or its prevention by the exclusion of the superfluous light, is possibly worth the attention of those who like clean negatives which only bear the image as formed by the lens. Whilst all our plates are rectangular, the light transmitted by the lens is always a circle, so that it would seem but reasonable to suggest that the use of rectangular "light screens" should be adopted. The idea of such screens is by no means new, it having been broached at least by Furnell (THE BRITISH JOURNAL OF PHOTOGRAPHY for 1881, p. 322) who suggested an arrangement of this kind within the camera.

It may possibly be permissible to interpolate here, as a sarcasm commentary upon the article, "About Photographic Patents," p. 31 of June 22, that a similar arrangement was patented in 1893 (Ap 12, No. 7481), twelve years later.

The exact position of these light screens as regards the lens is no moment, that is to say, they may be placed in front of or behind the lens, the latter being more convenient if the bellows rise when the lens is raised, otherwise before the lens should be chosen. It is of considerable importance, however, to determine their position they have a fixed aperture, or to determine their aperture if they have a fixed position. When the light screen is placed inside the camera, which can easily be effected by cutting it of stout celluloid, ebonite, or millboard, and wedging it in the folds of the bellows, its aperture may be determined by drawing a straight line equal to the diagonal of the plate and joining the two ends with those of straight line equal to the diameter of the diaphragm, thus forming a truncated cone, and one has only to determine at what distance from the diaphragm the light screen is to be placed to have at once the sides of a square which shall effectively cut off most of the superfluous light. As, however, we never use square plates, the sides of the light-screen aperture should bear the same ratio as the sides of the plate, and to find this out a very simple procedure is required.

Let us assume that we are to use a lens of 6 inches focus and full aperture of $f\cdot 6$ (in this case, for convenience, the actual, and not the effective, aperture is taken; to be strictly correct, the latter should be calculated), and the plate is to be $4\frac{1}{4} \times 3\frac{1}{4}$, and the light screen is to be fixed 2 inches from the diaphragm; then, if we call the light screen l and the plate p —

$$l:p \text{ as } 2:6.$$

Therefore for the longer side we have—

$$\frac{2 \times 4\frac{1}{4}}{6} = 1\frac{5}{12} \text{ for the longer side,}$$

and

$$\frac{2 \times 3\frac{1}{4}}{6} = 1\frac{1}{12} \text{ for the shorter side.}$$

Now, the sides of a rectangle inscribed in a circle of 1 inch diameter, that of the diaphragm, will be as $\frac{1}{2}, \frac{1}{2}$, so that for the final size of the light screen we get for the longer side—

$$1\frac{5}{12} + \frac{1}{2} = 1\frac{9}{12} \text{ inches} (= 2 \text{ inches approx.}),$$

and for the shorter—

$$1\frac{1}{12} + \frac{1}{2} = 1\frac{5}{12} \text{ inches} (= 1\frac{1}{2} \text{ inches approx.}).$$

Actually a light screen should be calculated for each diaphragm, but one will generally be found an improvement. Whatever material be used, its anterior surface—that is, the one facing the lens—should be covered with black velvet, and, if matt celluloid be used for this, there is not the slightest difficulty in cementing it down by using sheet celluloid dissolved in amyl acetate, or even moistening the surface with the acetate or acetone and pressing into contact. If wooden frames be used, a rabbet can be fitted, and it can then be used for carrying an isochromatic screen.

MERCURY-URANIUM TONING OF PLATINUM PRINTS.

[The following paper, which was read at a meeting of the Photographic Society of Philadelphia earlier in the year, has been in type for some time, but has had to be held over for several weeks through pressure on our space.—EDS.]

The fact that black undeveloped platinotype paper can be toned sepia by simple development is probably well known to many workers of this paper. One of the advantages of the carbon process is the fact that any coloured tissue may be used with the same facility. Still, in the platinotype process, many, in fact about all, the colours we desire may be obtained by toning. It would make this article too long to take up every possible colour, and I have therefore considered only those that will be of general use. These are various shades of sepia, brown, and red.

The sepia tone is produced by developing in the bath for the black paper, to which mercuric chloride has been added. The two solutions needed are, first, the usual platinotype developing salt, dissolved in fifty ounces water; and, second, a solution of one part bichloride of mercury in twenty-five parts water. On account of the varying solubility of this reagent, it is very inadvisable to use a saturated solution. This is mentioned, as some formulæ have been published, giving a saturated solution

of this salt; but, as it is soluble in 3 parts of boiling water and in 16 to 19 parts of cold water, you will see that a saturated solution is rather an unknown quantity. It is so with all salts, unless the temperature is given.

One part of this mercury solution is mixed with eight parts of the developer, and the bath is ready. The print is floated and developed in the regular way, and then placed in a hydrochloric acid bath, made by diluting the usual bath (1 part acid, sp. g. 1·16, to 60 parts of water) with 4 parts water, making a bath of one to 300. On testing the wash waters it was found that, after three washings in this strength of acid, all the iron had been removed. Should you wish to test for iron, the ferricyanide of potassium should be used, for, while it is true that light reduces some of the iron to a ferrous salt, yet I found most of it in the ferric state, and the ferricyanide and not the ferricyanide is the reagent. Should an acid bath of the usual strength be taken, it will cause the tone to rapidly fade out. One of the experiments with this toning is shown, the five prints, all printed to the same depth and mounted with the actinometer proofs, being on one card.

The first is developed without mercury; the second with 1 part of the mercury solution to 32 parts platinotype developer; third, 1 part to 18; fourth, 1 part to 12; and fifth, 1 part to 8, this latter being the correct amount.

This experiment is shown, not only for the tones produced, but it indicates how a rather flatly made print, whether over-printed or from other causes, can be made to look well, as the process seems to counteract flatness. This, in itself, is a good point, without regard to the colour of the print. You will note that the first weak additions of the mercury produce a muddy appearance in the prints, but when the proportions are correct this clears up entirely.

The question has been asked, "Is this colour permanent?" I think it is. I have one print that has been subjected to daylight for a long time. It was framed and hung near a window for three years, and, although the wall paper around the frame showed signs of fading, no difference could be seen in the tone of the print.

The question may also be asked, "Why not use sepia platinotype paper, and not tone?" The effects produced by the two processes are not alike, and we are able to produce any shade, with much less effort, by the toning method; and also, if the sepia is not entirely satisfactory, the toning can be continued into a deeper sepia, brown or red, by uranium. Before taking up local toning with mercury we will consider the uranium bath.

This bath is generally used in connexion with the mercury toning just described. However, a black print can be toned to a sepia brown or red by simply immersing it in the uranium bath, but the toning is very slow. The prints we have were so toned, and were in the bath about one hour. They had been black platinotypes, developed some months before the toning took place.

The best way to use this bath is to develop the exposed print in the oxalate developer, to which is added only half the strength of mercury that is used for sepia toning. By this development it acquires a faint sepia, being then well washed in the weak acid bath, and later in water. It is then toned in the following bath:—

Ten per cent. solution uranium nitrate	2 drachms.
" ferricyanide of potassium	2 "
Acetic acid	1 drachm.
Water	10 ounces.

The tone will go into a deeper sepia and various shades of brown and red. Almost any shade desired can be obtained, this toning being fairly rapid.

I would urge that no one put the hands in these toning solutions. This applies to both the mercury and the uranium baths, for they are both extremely poisonous and attack the skin. I found that one hand protected with rubber finger stalls was ample protection, and there is no necessity for these solutions touching the hands.

We now come to local toning. The local toning in itself is very easily accomplished, but, when one tries to combine two colours harmoniously, it will require, first, that the negative be of such a character as lends itself to two colours—and you will find very careful selection is necessary, for not many do this. This is really the most important point in local toning.

Second, the graduation of the two colours must be well balanced, so they merge one into the other. Try to paint a water colour in but two colours, and you will appreciate the difficulty encountered in this work. If the two colours do not harmonise, and good taste is not exercised, the result is entirely without artistic value. But this toning has a future for those who will work at it from an artistic standpoint.

One method is as follows: The undeveloped print is covered over entirely with a thin coating of glycerine, well rubbed in, and the surplus removed by a blotter. When the coating of glycerine is perfectly even, a brush is dipped in a mixture of equal parts glycerine and the mercury developer. Almost all of this must be removed from the brush, leaving only sufficient to work with, as there is no way of doing good work with a surplus on the brush. The portions to be toned are brushed carefully until the image appears, at which point it is quickly plunged into the black developer, and all portions, except the brush work, will come up in black. It is well to go over the surface with a wad of cotton, while in the bath, to ensure even toning. It is then washed in a weak acid bath, and finally in water. Another method of brush development is to cover over with glycerine all the parts of the print which are to remain black, leaving those parts which are to be toned sepia entirely free from glycerine. The uncovered parts are then filled in with the same mixture as above, the rest of the process being same as before stated. This tends towards less liability of making errors in the location of the sepia tone, and by having a blotter constantly at hand one can easily prevent the tone extending where not wanted.

Now, it is not necessary that this local application of the mercury developer should produce the correct tone. It is only necessary that it be applied where the tone is needed. Should the tone not be what is wanted, or should it fade in a too strong acid bath, the correct tone can be readily obtained by using the uranium bath. This will not only give the mercury sepia colour, but it will also give any deeper shade required. Some of the prints here were left in the acid bath until of an even black all over, but they immediately took the sepia locally when placed in the uranium bath.

The brush used for this mercury toning must not be used when black tones are required.

To produce the local uranium tone, after completing the above work, the print is immersed in the uranium bath, and the portions covered with mercury will soon tone to the colour desired. Should it be too deep, a weak solution of sodium carbonate will reduce the colour, but a little acetic acid should be added to the wash water if soda is used. In fact, as the water is usually alkaline, it is a very good idea to always use a little acetic acid in the washing, for an alkaline water will soon wash out the colour.

There is also another way, which, however, can only be used with certain prints; but where it can be used I think it is one of the most satisfactory means of producing local toning. It refers mostly to portrait work, and might be called selective toning. The negative should have almost clear glass for the blacks; that is, in portrait work, the background and drapery should be black.

When a print made from such a negative is immersed in the mercury developer, the deep blacks develop black, while the face and any light colour appear sepia, thus giving the effect of two colours on one print. The result is really usually more harmonious than that obtained by the glycerine method. Some prints are shown, developed in this manner, both by mercury and by mercury and uranium. The latter tone is obtained by simply placing the mercury-toned print in the uranium bath.

You will note that the methods of control differ in the mercury and in the uranium baths. In the former the colour is decided by the amount of mercury added, and not by the time of development. In the uranium bath, however, the print remains in the solution until it has acquired the proper tone. I would call attention to the fact that this uranium toning is really an intensification of the print, and produces a stronger effect than the original black tone. Where the print is too weak, this is a decided advantage.

Should you wish the mercury tone reduced, a strong hydrochloric acid bath will do it; and to remove the uranium tone, a weak solution of sodium carbonate is used. Some effects in local toning can be obtained by this latter method.

A word about the effect of reduction on the platinum image may not be out of place. A pure black platinotype, without mercury, can be reduced and intensified repeatedly, in the uranium bath, without producing any effect on the reduced platinum in the image. Nitro-muriatic acid is probably the only reagent that will effect the platinum image, and it destroys the paper at the same time. But when we combine the mercury with the platinum, and intensify with uranium, the ferricyanide in the bath is converted to ferrocyanide, and it combines with the mercury, uranium, and platinum to form ferrocyanides of these bases, wherefore the whole image can be removed in a strong alkali. I have cleared off the platinum image entirely by this means and this is the reason a weak alkali is recommended above.

I feel no diffidence in advocating a process that can be of such use to

platinotype workers. Its advantages may be summed up as follows: first, we can change the colour of our platinotype to the shade that seems most in keeping with the qualities of the picture. Second, if the colour we obtain is not what we wished for, it can be reduced or intensified at our pleasure. Third, we can take a print from a flat negative and develop it to a much stronger-looking print than would be obtained in the black; and, lastly, we can tone the same print to many shades by purely chemical means, thus placing a power in our hands not available in the one-colour print.

PREScott ADAMSON.

POLONIUM AND RADIUM.

[Translated from the *Camera Obscura*.]

In my communication upon this subject, published in the first number of this periodical, I expressed the hope that treatment of large quantities of uranium ore for the extraction of both these radio-active substances, which M. and Mde. Curie and I had undertaken, might lead to elucidation in various ways of the phenomena of the invisible rays.

This hope has been fulfilled in the most gratifying manner. Whilst at the time of the said communication the Becquerel rays were *terra incognita* even to the scientific world, at present this spontaneously radiating substance has become generally known, and a large number of learned people are eagerly studying the question.

As will hereafter be shown, radium is the more important of these two radio-active substances. Through the kindness of the Austrian Government M. and Mde. Curie were provided with 2 kilos of active barium chloride obtained from Joachimthal pitchblende. The firm of de Häen, of Hanover, also undertook most obligingly to prepare for me about 1 kilo of active barium bromide from about 1000 kilos of residue from their manufacture of uranium, and they also placed at my disposal the raw material from the same, for recovery of the polonium, but this has scarcely yielded me a gramme of the polonium preparation.

By repeated fractional crystallisation of the whole of the barium bromide I have raised its activity to such an extent that the remaining 15 to 20 grammes enabled me to exhibit the experiments for the first time before a large audience at the Munich Convention of Naturalists. This 15 grammes has now been further condensed to about 1 gramme, and it exhibits a corresponding accession of activity.

But the increase in the activity of the preparation does not even yet appear to have attained finality. It seems probable that it may be raised still more, until all the barium is removed and radium alone remains, provided sufficient substance be left. I find this already a serious difficulty in the way of further experiment. M. and Mde. Curie are rather more favourably placed, and they are strenuously endeavouring to isolate the radium by this method. The prospects are very promising now that Demarçay has shown by spectroscopic investigation that there is little doubt of the presence of a second unknown element in the active baryta salt.

Demarçay first discovered, with the Curies' intermediate preparations four new lines, and this has also been confirmed by Professor Runge, of Hanover, who has examined the preparations I had then made. Demarçay ultimately received a few milligrammes of a barium chloride which not only exhibited these four stronger spectrum lines, but also about a dozen more, which were of equal intensity with the barium lines. In this way it was possible to estimate the presence of from thirty to fifty per cent. of radium in the specimen of barium chloride. But there is a further reason for the presence of radium in the active salt.

Mde. Curie has determined the quantity of chlorine in the active barium chloride, and has found that it is much less than combines with normal barium chloride, and the deficiency increases with the activity of the salt. This is easily explained if we assume that the barium is associated with another element of higher atomic weight. Radium would thus belong to the elements of high atomic weight. Whether the property of radiation depends upon this is at present mere supposition, although the radio-activity of uranium and thorium, which are of the highest atomic weight, points in that direction. Meanwhile we are still uncertain whether this is a property of uranium and thorium, or of accompanying impurities.

The evidence for the existence of polonium, on the other hand, is quite unreliable. In regard to this both Demarçay and Runge have been unable to discover anything beyond the bismuth lines.

The activity of polonium, moreover, soon declines to such an extent, according to my experience with the preparations I have made, that it would appear to be merely a case of the so-called "introduced activity" discovered by Curie. The Curies exposed metals, fluor spar, &c., to intense radiations of radium for some time, and these substances thereupon

became active. The active bismuth (polonium) obtained from uranium ore had previously been in contact with radium, and had thus had the opportunity of acquiring activity. Perhaps it also behaves similarly with the third radio-active substance, titan, discovered by Debierne in uranium ore. We should do well to distinguish between radium and polonium, both as regards their chemical and physical properties, before we give a definite answer to these questions.

It should be remembered also that I have shown, in regard to radium, that the salts lose their activity almost completely when they are changed from the solid to the fluid state by dissolving them in water, and that the crystals obtained from the solution at first exhibit very little activity. But this condition is only transitory. The activity of the crystals increases day by day, until in the course of a few weeks a maximum is attained, which remains constant. Elster and Geitel have also observed that heating the crystals *in vacuo* for a considerable time has the same effect as solution, but in this case complete recovery also takes place in course of time.

On the other hand, when the polonium preparations lost their activity, they never returned to the original state.

The rays emitted by the preparations of radium and polonium were very different in their behaviour. Whilst the former excited slight phosphorescence upon the screen after traversing plates of lead fifteen or more millimetres thick, the latter were completely cut off by relatively thin plates of metal or even wood. In consequence of this, the rays of polonium exhibit a skiagraph of greater contrast (for instance, of the hand) upon the screen than those of radium. But, even with the aid of photography, no differentiation between the bones and the soft parts could be obtained with any of the preparations. The rays of radium filtered through a sheet of lead failed to produce a skiagraph of the hand, as they had too great power of penetration, and further sheets of the same metal offered very little more obstruction. This forces us to the conclusion that the rays of radium are not homogeneous, but of different absorbability. This want of homogeneity of the rays of radium is clearly shown by their different behaviour in the magnetic field.

Before we go into this question it is desirable first to review the other properties of the more intense Becquerel rays. These may be divided into four groups, viz., (1) their electrical action; (2) their phosphorescent action; (3) their chemical action; (4) their magnetic action.

1. The discharging property of the Becquerel rays as a consequence of the change in the conductivity of the air for electricity produced by ionisation was discussed in the first communication. According to Curie, in the case of very active preparations, the formation of ozone occurs with this ionisation.

Under suitable conditions the crackling discharge of sparks from an electrical machine is transformed to a scarcely audible buzzing discharge under the influence of radium radiation. The path of the sparks of an induction apparatus is influenced in the same way as by violet light.

Quite recently the Curies have shown that the rays themselves possess and transmit negative electricity, exactly the same as cathode rays, and the substance should therefore be capable of a very strong positive charge if it could be sufficiently isolated. As it has only been possible hitherto to generate electrical charges with substances possessing weight, it may be inferred that radium is the seat of a constant emission of negatively charged particles of matter. The preparation should therefore gradually lose weight. The Curies have, however, calculated that this loss is so infinitesimal that after many years it could scarcely be detected.

2. The phosphorescent action of the new preparations is very remarkable, and, besides the substances formerly referred to, fluor spar, glass, cinchonine bisulphate, rock salt, and many other substances become luminous.

Phosphorescent sulphide of zinc becomes intensely luminous for some time. Fluor spar becomes slightly phosphorescent for weeks if exposed to the radiations for some time after having been deprived of its thermoluminosity by heating to redness. When heated, it again radiates very intensely. The phosphorescence of the radium salts themselves is, as I have shown, most marked in the case of anhydrous barium bromide hermetically sealed in a glass tube. Such a preparation has now been diffusing its comparatively bright, blue light nearly a year, regularly and without intermission and quite independent of any source of light. The phosphorescence suffers by the action of heat, but is restored by cold. Becquerel radiations remain unaffected under the same conditions.

I prepared some barium platino-cyanide from active baryta salts. As might be expected, it was strongly phosphorescent. The phosphorescence (not the radiation), however, declined rapidly, and at the same time the green salt changed to yellow, then orange, and finally brown.

The same change in colour of the ordinary platino-cyanide of barium is known as an effect of the prolonged action of intense Röntgen rays, and the phosphorescent action is simultaneously impaired.

If the discoloured, brown, radio-active platino-cyanide of barium be dissolved in water, it may be recrystallised in the primary state.

I have ascertained that the brown colour of the salt is due to a phenomenon of polarisation, similar to that of the tourmaline, and consequently only occurs when the crystals cross, whilst a single crystal does not appear to be of different colour when examined by transmitted light.

The manifestation of light, discovered by me, when a radium preparation is brought near the closed eyes or the temporal bone, is, doubtless, due to phosphorescent action.

3. The chemical action is not confined to the photographic plate, but printing papers are also darkened if the action is sufficiently prolonged. A whole series of chemical changes brought about by the rays, and characterised by discolouration, have been published.

Curie found that a glass, in which a preparation had been kept, had been stained deep violet. Sometimes the colour was brown, and this was due to the composition of the glass. Röntgen tubes become similarly discoloured at those parts upon which the cathode rays impinge. Rock salt, bromide of potassium, chloride of potassium, &c., and colourless fluor spar become similarly discoloured when they are exposed for some time to the rays of radium, which in this respect act analogously to cathode rays. If the view be correct that we have a fixed solution of alkaline metal in these coloured salts, as seems probable from my former experiments (I obtained the same colourations by heating the salts in fumes of sodium and potassium), this would be an instance of very energetic chemical action by Becquerel rays.

The colouration of strongly radio-active barium chloride, or bromide, which may be observed after keeping the salts for some time in the dark, is attributable to the same cause. These colourations, excepting in the case of glass, are all destroyed by the action of light.

4. The divergence of the rays of polonium and radium in the magnetic field, which does not take place with Röntgen rays, was discovered by me in October of last year, and demonstrated photographically.

The densest part of the image was, of course, at that part of the plate where the polonium preparation was placed in a paper capsule. This was separated from the plate by black paper. The whole arrangement was then placed horizontally upon the pole of an electro-magnet. In one instance it was so arranged that the substance was situate on one side exterior to the rectangular pole, whilst in the other instance it was exactly within the circular pole.

Whilst the impression upon the plate would only be produced under the capsule when the magnet was not excited, the image was spread out laterally in the direction determined by the polarity of the electro-magnet, when the magnet was inserted in the circuit.

Curie and Becquerel have followed the matter further with their preparations, and Stefan Meyer and Schweidler likewise by measurements from mine. Doubtless the Becquerel rays in this case behave the same as cathode rays, and this forces us to the opinion, that the radio-active substances throw off negatively charged particles with enormous speed derived therefrom. As I have already mentioned, Curie has been successful in demonstrating this.

According to Curie, the rays of radium may be divided into those which are, and those which are not, deviable (like cathode rays), and this confirms their want of homogeneity. The Paris preparations of polonium, however, differ from mine by showing mostly rays which are not deviable. But I think that this dissimilarity does not depend upon any difference in the substance, but rather upon its age.

The experiments as to the presumptive nature of the waves of these rays have been without result, even with diffuse reflexion, but none have yet been made with the most recent preparations.

There yet remains the high sensitiveness of the test for the radioactive substances by means of their radiations, to which attention should be drawn. Upon the evidence of the spectrum observations to which we have referred, it is possible to detect in the 1000 kilos of residue from which the material I used was obtained the presence of only a few milligrammes of radium. Consequently, only one-millionth per cent. could be most distinctly detected, but this was also possible by means of an ordinary electroscope. Much more minute quantities might be discovered by means of long exposure of a photographic plate. Barium bromide becomes luminous when it contains but one-thousandth per cent. A piece as small as a pin's head vapourised in a Bansen burner would suffice to render the air of a large hall more conductive for some time, as Elster and Geitel have shown, and thus prove the fact at a great distance.

Only by this extremely delicate proof could the discovery and preparation of the radio-active substances be made. Although this work is only half finished, it has disclosed so much that is peculiar and new that the main question of the source of the energy of these rays seems, for the present, driven into the background. If further interesting discoveries should result, it would not be matter for regret that the satisfactory explanation of the phenomena still appears far off, whilst our conjectures assume more definite form.

DR. F. GIESEL.

NOTES ON TELE-PHOTOGRAPHY.

At the April meeting of the Photographic Society of Philadelphia the Rev. F. S. Dobbins, who read a paper on this subject, pointed out "that there is a very simple rule for finding the approximate length of bellows required by the tele-photo attachment. The negative lens is usually one-half the focal length of the positives. Multiply the focal length of the negative lens by one less than the number of magnifications desired, and the result is the bellows length required approximately. Thus seven times $3\frac{1}{2}$ inches gives $24\frac{1}{2}$ inches bellows length needed with positives of 7 inches and a negative of $3\frac{1}{2}$ inches for an eightfold magnification. On the baseboard of my camera," proceeds Mr. Dobbins, "I have marked off the points to indicate the varying bellows length required for the different magnifications—eightfold, sevenfold, &c. 'Magnification' means linear magnification, so many diameters greater than the original image made with the positives of the combination only."

"As to the comparative size of the tele-photo arrangement and a camera with positives only, Dallmeyer's rule, confirmed by calculations made for me by the Bausch & Lomb Company, shows this rather remarkable state of things. This little box of mine, with this tiny tele-photo attachment (the attachments cost from 16 to 24 dollars), gives precisely the same results for an eightfold magnification that would be accomplished had I a camera 56 inches in bellows length, with a pair of lenses 9 inches in diameter, mounted in a barrel (or keg, literally) 12 inches long. The rule to find the equivalent of any magnification is simply to multiply the focal length of the positives of the combination by the number of magnifications: thus, 8 times 7 gives 56. If I make simply a sixfold magnification with a bellows length of about 17 inches, it is the equivalent of an ordinary lens of 42 inches focal length.

"I may remark, in passing, that I have hitherto yielded to the desire to see what the tele-photo lens will do, and so have almost always strained the lens to its utmost. This is like a novice, but unwise. One ought to be content with a sixfold magnification, for the results are better in every way and the exposure is so much lessened. I shall mend my ways in this respect. Some of the illustrations I bring you this evening would have been much better had I but had the good sense to exercise some restraint in this direction before. Moreover, nine times out of ten the 4×5 plate is preferable to a large one, for certain reasons.

"I put my 4×5 camera, the box addition, the tele-photo attachment, the shutter, lenses, focussing cloth, focussing glass, six double holders with a dozen plates, all into a case. The whole measures $18 \times 8 \times 7$ inches, and weighs just thirteen and a half pounds. So it is not bulky or weighty. I use a good, substantial tripod. When possible I get behind a tree or a building, out of the breeze; the wind's vibrations must be guarded against. In setting the camera I rack out the bellows to the point of the magnification desired, and then focus with the tele-photo adjusting screw.

"I use isochromatic plates almost altogether. I notice that Dallmeyer, Spitta, Marriage, and others who have written on tele-photo work, all use isochromatic plates. A colour screen is almost necessary for distance work, to cut out haze, and the consequent exposure is so very much less with the isochromatic plates than with others that one finds after a little that he must depend on these almost always.

"As to exposure. This is the one great problem which plagued me. I have worked away at it and with some results which I give to you in printed form. Let me say that the tables are tentative merely. I expect with larger experience to revise them. Yet they represent the results of my experimenting up to this time. The rule usually given is that the exposure should be the normal exposure with the ordinary lens multiplied by the square of the magnification.

"I have found this to be the maximum exposure.

SUGGESTED TABLES OF RATIOS OF EXPOSURES.

"For use with tele-photo combinations (positive and negative lenses): Multiply the normal exposure with ordinary photographic lens for an object in the shadows by the figure given. (Usually one determines the normal exposure with a Wynne exposure meter by holding it in the shadow of the body.)

"1. For objects 1000 feet distant or less, using no colour-screen:—

Magnification.	8	7	6	5
Dark objects in shadow	64	49	36	25
Dark objects in good light }	48	36	27	18
Bright objects in shadow }	32	24	18	12
Bright objects in good light	16	12	10	8

"2. For objects more than 1000 feet distant, using a colour screen and isochromatic plates (if no screen is used, the exposure will be, of course, but one-fourth the length of time when the screen is used):—

Magnification.	8	7	6	5
Dark objects in shadow	64	49	36	25
Dark objects in good light }	50	38	28	20
Bright objects in shadow }	35	28	21	15
Bright objects in good light	20	18	14	10

"The variations are not so great as they seem, being equal to that from one second to three-fourths of a second, to one-half of a second, or to one-quarter of a second.

"As to the development of plates exposed, in connexion with the telephoto attachment, I notice that it must be carried much farther than with ordinary exposures. I notice, also, that the development proceeds much more slowly. I do not know the reason of this."

THIEMANN'S IMPROVEMENTS IN CAMERAS.

[Patent No. 7722 of 1900.]

A SYSTEM of construction, whereby the plates are mounted in a drum, with which they rotate, so as to be consecutively exposed on coming opposite a lens located in a second, outer drum, in the interior of which the first-mentioned drum is contained.

a is the outer cylindrical case or drum, of pasteboard or other suitable material and of any convenient size. At the front of this drum is located

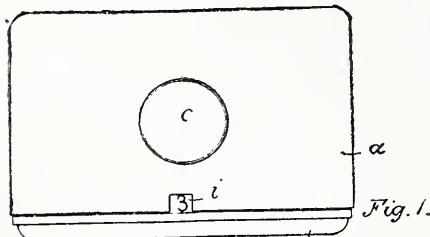


Fig. 1.

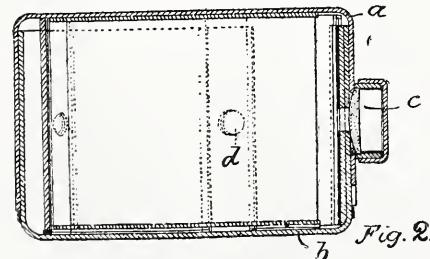


Fig. 2.

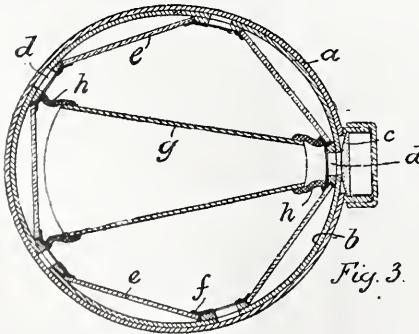


Fig. 3.

the lens, *c*, the centre point of which coincides with the centres of a series of apertures, *d*, in the wall of an inner drum, *b*. This latter may be made of the same material as the containing drum, and is of such size as to fit closely within the latter, with capability of rotation. Between each two apertures, *d*, a photographic plate, *e*, is arranged in guides or

grooves, *f*, vertical to the base of the camera. There should be an uneven number of plates, so arranged corresponding to an uneven number of apertures.

If now the drum, *b*, is rotated relatively to the containing drum, *a*, so that the lens coincides with one of the apertures, *d*, the plate, *e*, which lies opposite the latter, will be exposed. In order to ensure the exposure of only a single plate at a time, a conical light shaft, *g*, is arranged on the top of the drum, *a*, the joints being rendered air-tight by strips, *h*, of felt or like material.

After the exposure has been completed, the drum, *b*, is rotated further until the next plate is brought into position ready for exposure. A series of numbers corresponding to the plates may be provided on the inner drum, *b*, and a slot cut in the outer drum, the appearance of a number thus indicating that a plate has come into position for exposure.

Instead of plates, films can be employed, the drum, *b*, in such case being provided with rollers to receive the film.

For taking stereoscopic pictures two such cameras may be united by suitable sliding devices.

PERAUT'S IMPROVED CHANGING BOX.

[Patent No. 4306 of 1899.]

THE apparatus consists of a box, *a*, divided into two compartments by a partition, *b*, and of two sliding shutters, *c*.

On each side of the box is jointed, at *e*, a lever, *f*, the ends of which enter slots, *g* *h*, formed in the slides. The two levers, *f*, are connected together by a frame, *i*, which is kept upright by means of a spring, *j*, fixed to the upper wall of the box in which the apparatus is placed. This

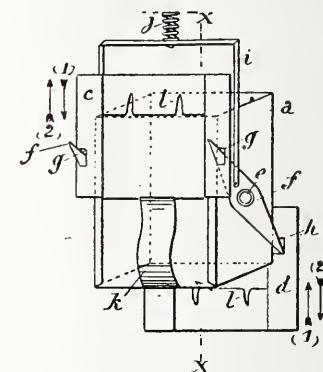


Fig. 1.

box is not shown in the drawing. *k* are springs pressing forward the images contained in their respective compartments. A button placed outside the box which contains the apparatus, when pressed downwards, presses upon the frame, *i*, and lowers it; this frame, on being lowered, acts upon the two arms, which oscillate, drawing the two slides with them in the directions indicated by the arrows, 1, 1. Each slide in its movement draws within it a plate by means of tongues, *l*, and causes it to take the last place in its respective compartment.

When the button is released, the spring draws the slides back into place.

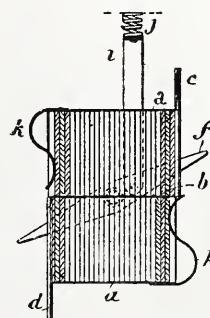


Fig. 2.

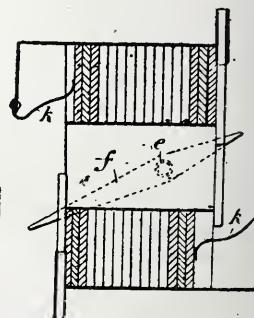


Fig. 3.

in the direction indicated by the arrows, 2 2, by means of the arms and the frame; the slides uncover the image so that it can be seen. The operation may be repeated indefinitely.

In fig. 3 is shown a modification that may be applied to the apparatus in order to allow glass negatives to be placed therein, and to be able to see the images upon a negative isolated from the others in order not to be immodded by super-position.

For this object it is necessary to have three compartments, as shown in the drawing, and to alter the respective lengths of the arms, *f*, of the levers in the ratio of 1 to 2.

Our Editorial Table.

SCHERING'S CHEMICALS FOR PHOTOGRAPHY.

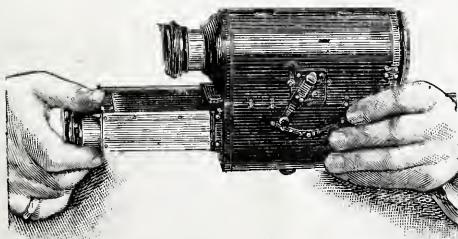
Wholesale Agents : A. & M. Zimmermann, 9 and 10, St. Mary-at-Hill, E.C.
WE understand that the celebrated house of Schering, of Berlin, to whom, for many years past, photographers have been indebted for the supply of exceedingly pure chemicals for developing and other purposes, intends placing pyrogallop on the market in the form of concentrated crystals, thus very greatly diminishing the bulk occupied by the ordinary sublimed or flocculent form. Of this latter substance a sample bottle has kindly been sent us by Messrs. Zimmermann. It is a great many years since we first used Schering's pyro, and we well recollect the favourable reception accorded to it on its introduction. It remains to-day what it was then, an ideally pure product yielding images which, for perfect density, gradation, and cleanliness of deposit, leave nothing to be desired. Schering's pyro is a standard photographic chemical which deservedly enjoys world-wide use. In these days of a rapidly accumulating list of reducing compounds for photographic development, it is of interest to point out that we still have in present use a brand of "pyro" which was originally brought to the notice of photographers something like a score of years ago. Messrs. Zimmermann have also sent us samples of Schering's formalin and adurol. The former, it may be noted, is a patented product which, when employed in a diluted form, has many uses in the hardening of gelatine films on glass, paper, &c. Adurol, a modified form of hydroquinone, is also one of the Schering products that has been sent us. The characteristic property of this substance may be best and most briefly indicated by the remark that it possesses the virtues of a combined hydroquinone-metol developer without the drawbacks of either. It keeps well in solution, does not stain, and is suitable alike for negative and positive work. We have much pleasure in recommending the chemical products of the house of Schering to photographers. They are always pure and carefully prepared, and their properties are not overstated. Messrs. Zimmermann will send a complete list on application.

MR. COURTNEY S. JONES, of High-street, Woodford Green, Essex, sends us samples of his Mimosa midget mounts and photo seals. The latter are backed with an adhesive, and at the present time, when tiny photographs of celebrities are very greatly in vogue, they should be popular amongst the large class that appreciates the opportunity of adorning their stationary with photographic seals. The Mimosa midget mounts are fanciful in design and colour, and add to the effect of small photographs.

THE "Perfect Retouching Medium" is the name given to a preparation sent out by Mr. F. W. Slater, photographer, of Central Mostyn-street, Llandudno. The experience of a professional photographer should stand him in good service when putting up a retouching medium. Mr. Slater says that after careful and repeated trials he has at last placed a medium on the market which he hopes will meet with success by its users, and gain a fair share of patronage. Some of the advantages claimed for the medium are, that it offers a splendid tooth; that work will not shift when varnished; and that only the best materials are used in its manufacture, being perfectly pure and clear. The report we have received of the "Perfect" medium supports these claims. The medium is sent out for 1s. post free.

THE STEREOSCOPIC "BINOCULAR" CAMERA.

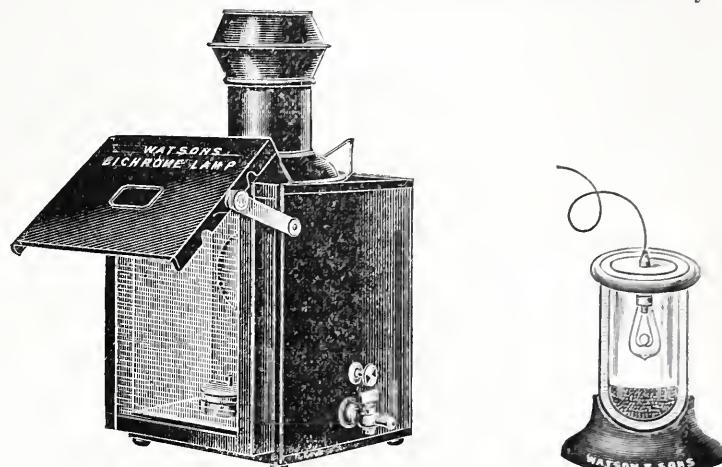
Manufactured and sold by W. Watson & Sons, 313, High Holborn, W.C.
HITHERTO the ingenious little stereoscopic binocular camera which Messrs. Watson introduced a few months ago has depended for its changing method upon the bag system, the exposed plate being drawn into a bag attached to the instrument. But, by a recent improvement, a sliding magazine has been substituted for the bag, so that the changing



has been much simplified, and the convenience of the instrument enhanced. The illustration shows the extremely simple manner in which changing is now effected. To do this, the camera, it is pointed out, must be held in a horizontal position, with the lenses showing upwards. Then the lower eyepiece, which carries with it the magazine, must be drawn out by the flange provided for the purpose. When fully drawn out, the exposed plate falls to the bottom, and the magazine must then be returned to its original position, the act of returning it recording the number of the exposure. When it is required to refill the magazine, two

clamping screws at one side of the camera must be loosened, when the magazine can be entirely withdrawn; then, by removing a stop from one end of the magazine, the sheaths can be drawn or dropped out through the aperture that is provided. The mechanism by which these movements are effected is exceedingly simple, and the action is perfectly easy and certain. We are pleased to learn from the makers that the "stereoscopic binocular" is meeting with great favour. As our readers know, anything which promotes this favourite branch of work has our support.

THE use of a solution of bichromate of potash as an "illuminating medium" for dark-room purposes has given Messrs. Watson the opportunity of providing two lamps, to which a tank of the mixture may be



applied as the "light filter," if we may use the term in this connexion. The illustrations show a lamp of the ordinary construction, and an incandescent electric bulb, both of which have been adapted to take the coloured solution.

THE ROTOGRAPH BROMIDE PAPERS.

Manufactured by the Rotary Photographic Company, Limited, 23, Moorfields, London, E.C., and West Drayton.

VISITORS to the Exhibition at the Crystal Palace two years ago may remember a strip of printed bromide paper, which stretched up to the roof of the building. This was the production of the Rotary Company, which, since that date, has been engaged in the production of bromide prints, large and small, for commercial purposes, such as the adornment of cigarette boxes, advertisement cards, Christmas cards, and many other purposes to which this method of printing renders itself so easily adaptable. By far the greater part of the paper which this Company prepares is used at the West Drayton works for making these prints, but it has recently been decided to supply photographers and others with the paper, and accordingly we have been favoured with samples of it. There are something like half a dozen kinds of the paper available, viz., thick and thin glossy, thin smooth, thick smooth, thin rough, and post-card paper. The papers appear to be prepared with great care, and to have the capability of yielding the very best quality of developed image in silver. We wish the Rotary Company success in their enterprise. The market and demand for bromide printing papers appear to have no limit. The facilities for automatic printing which the process furnishes, the cheapness of production, and the unquestioned excellence which the results may be made to possess single out this system of photographic positive work as one of the most popular of the present time. The Rotary Photographic Company enter the market at an opportune moment, and the quality of their productions should secure them a large share of public patronage.

KURZ GEFASSTES CHEMISCHES WÖRTERBUCH.—DR. CARL ROTHE.

Verlag der Deutschen Photographen Zeitung, Weimar.

THE compiler of this dictionary of chemical terms has rendered a service to German photographers which we hope will meet with the recognition it deserves. By condensation, and the elimination of every superfluous word, not far short of four thousand references are given in an octavo volume of 192 pages. The work has been written especially for the use of photographers, and the price places it within the reach of a large number of persons for whom a Standard Chemical Dictionary would be too costly and elaborate. The following extract, with translation, will give an idea of the information contained in the volume, and the method of condensation :

S. kaliumbromid, bromkalium, kalium bromatum (Ph.)=K.Br.; fbl. Würfel; D. 2·41; l. i. 1·62 k. W., l. i. 1. h. W., l. i. 750 alk. Kg. 4·10.

Injurious or poisonous in the general sense. Potassium bromide, bromide of potassium, kalium bromatum (Pharmacy)=K. br.; colourless, cubical; specific gravity 2·41; soluble in 1·62 parts of cold water, soluble in 1 part of hot water, soluble in 750 parts of alcohol. Price, M. 4·10 per kilo.

Studio Gossip.

ADDRESS WANTED.—Mr. T. Everett Innes, of 108, Wellington-road, Heaton Chapel, writes: "I should be greatly obliged if you could inform me of the address of any one in Belfast who will undertake to teach a young lady to colour small photographs." Some Belfast reader may be able to supply Mr. Innes with the desired information.

THE NON-RETURN OF PHOTOGRAPHS.—Mr. J. Browning writes: "With reference to the non-return of photographs sent in answer to advertisements, a very simple and effective plan is to cut the photographs in two from corner to corner. They are just as good, and prevent unscrupulous photographers from making use of them. I have no doubt this would answer equally as well with the stage."

AN EFFECTIVE WINDOW DISPLAY.—Messrs. J. Bulbeck & Co., 166-168, Strand, London, W.C., are utilising the large window at the entrance to their premises for the display of a number of fine specimens of architectural photography. The pictures, which are in carbon and platinum, are of very high technical quality, and have deservedly attracted the close attention of many thousands of Strand wayfarers.

News and Notes.

The Röntgen Society's Annual General Meeting will be held on Thursday, July 5, at 20, Hanover-square. The presidential address will be delivered by Mr. Wilson Noble.

AMONG the congresses to be held in Paris this summer there will be one to consider "Les Arts du Dessin," which might be translated the arts of illustration, so conspicuous are they on the circular, were it not that painters and sculptors are also expected to take part. Two subjects on the programme will be all the better for serious discussion—the advantage of other than mechanical methods of reproduction, and the question of copyright in all its relations. The Congress will be held at the Ecole des Beaux-Arts from July 9 to 12.

THE LATE G. J. SYMONS.—A meeting was recently held at the Meteorological Society to consider the question of a memorial of the late Mr. G. J. Symons, F.R.S. It was resolved that the memorial should take the form of a gold medal, to be awarded from time to time by the Council of the Royal Meteorological Society for distinguished work in connexion with meteorological science. An executive committee was appointed to take the necessary steps to raise a fund for this purpose. Contributions will be received by the Assistant Secretary, Mr. W. W. Marriott.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—At a meeting of the Executive Committee, Wednesday, June 20, 1900, Mr. H. Snowden Ward in the chair, the Secretary reported that the following had signified their intention of upholding the rule adopted by the Conference of Judges, in addition to those whose names are published in the "Red Book": Messrs. Valentine Blanchard, W. Thomas, Frederic Hollyer, Henry Sturmy, Harold Baker, and Mrs. Catharine Weed Ward. The total number of signatures now stands at thirty-two. General business and the consideration of arrangements for new lectures and the revision of old lectures occupied the meeting, which was adjourned to Wednesday, June 27.

The Aintree Photographic Society's Seventh Annual Exhibition will be held November 13 to November 17, 1900. The classes for open competition are as follows: Class I., Landscape or Seascapes; Class II., Architecture; Class III., Enlargement; Class IV., Figure Studies and Portraiture (amateurs only); Class V., Figure Studies and Portraiture (professionals only); Class VI., Hand Camera; Class VII., Lantern Slides. Lecture Class.—Lectures may be on any subject, and to be illustrated with fifteen to twenty-five slides, and occupy not more than twenty minutes in delivery. The awards will be gold medal for best picture in the Exhibition; silver medal, bronze medal, certificate in each class. The Hon. Secretary is Mr. Theodore Wood, 12, Highfield-road, Walton, Liverpool.

PROTECTING ANCIENT BUILDINGS.—Good evidence of the valuable work carried on by the Society for the Protection of Ancient Buildings is contained in their annual report, which was presented at a meeting held last week at the rooms of the Society of Antiquaries. In the case of London, the report regrettably notes the destruction of Tudor House, at Bromley, by the London County Council, and also hints that there is some danger lest the house in Fleet-street, known as Henry VIII.'s palace, which has been preserved by that body, may still be injured by the more insidious process of restoration. The Society is also interesting itself in the preservation of the handsome old houses in Lincoln's Inn-fields, attributed to Inigo Jones, which are likely to suffer through the construction of the new street between Holborn and the Strand.

AUTOMOBILE CLUB 1000 MILES TRIAL.—Mr. Henry Edmunds, a member of the Committee of the Automobile Club, has placed at the disposal of the Committee three prizes of 5l. 5s., 2l. 2s., and 1l. 1s. for the best set of twelve mounted photographs taken on the occasion of the 1000 miles trial of the Automobile Club. The competition is open to the public, whether they be professional photographers or not. The photographs should be addressed to the Secretary of the Automobile Club, 4, Whitehall-court, London, S.W. The Judges are Messrs. Henry Edmunds, Edward Kennard, Henry Sturmy, Charles Cordingley, and the Secretary of the Club. Photographs submitted for competition may, if desirable, be retained by the Judges, whether they are awarded a prize or not. Photographs for competition must be submitted not later than Saturday, July 14.

THE BORCHGREVINK EXPEDITION.—Mr. C. E. Borchgrevink read a paper on Monday night before the Royal Geographical Society on "The Results of the Sir George Newnes Antarctic Expedition." The lecturer pointed out that the great difference between Arctic and Antarctic expeditions was that in the latter

case there was absolutely no meat to be had, unless seals could be regarded as such. The reason was due to the tremendous gales of sleet and snow which raged in the Antarctic regions, and rendered it impossible for animals to exist. The expedition which he had had the honour to conduct by means of the "Southern Cross" had got further south than any previous expedition. The southernmost point was reached on February 16 of this year. In addition to discovering the approximate position of the South Pole, they had discovered the Duke of York Island and Cape Constance, a name he gave in honour of his wife. He had made careful observations of the sun and currents, and had secured specimens of the few forms of life found there, chiefly bird and fish. Lieutenant Colbeck had prepared an important map from the "Southern Cross" of a part of the coastline of Victoria Land, which contained a good deal of new information. Mr. Borchgrevink exhibited by means of the lantern a large number of photographs he had taken on the expedition.

PROFESSOR OLIVER LODGE.—Dr. Oliver Joseph Lodge, Professor of Experimental Physics in University College, Liverpool, who has been appointed by Her Majesty first Principal of the new University of Birmingham, is forty-nine years of age, and a native of Staffordshire. Educated at the Newport, Shropshire, Grammar School, he commenced business with his father, Mr. Oliver Lodge, who was in failing health, at the Potteries, at the age of fourteen. He continued in business till the age of twenty-one, in the mean time visiting London, and attending a course of lectures by Professor Tyndall. He passed the London Matriculation examination in 1871. He became a D.Sc. in 1877, and the same year was appointed Assistant Professor of Physics and Mathematics at the University College, Liverpool. In 1880 he was appointed to the post which he now quits, that of Professor of Physics at the University College, Liverpool. From 1884 to 1886 he was scientific adviser to the Electrical Power Storage Company. He is the President of the Physical Society of London, has been a Fellow of the Royal Society since 1887, he is a honorary LL.D. of St. Andrews, and has written largely in the scientific journals on mechanics and electricity. His works comprise *Modern Views of Electricity*, a collection of his contributions to the scientific press, *Lightning Conductors and Lightning Guards*, *Pioneers of Science*, a popular illustrated work on astronomical biography and discoveries, and *The Work of Hertz and his Successors*.

PRESERVING OLD LONDON.—The fourth report of the Committee for the Survey of the Memorials of Greater London has been issued. The object of the Committee is to examine certain areas in London, and in them to register whatever may be deemed to be of historic or aesthetic interest. The work is not confined to buildings only, any valuable open space, any remnant of an old village green, any beautiful tree, any object of local life or custom, or interesting piece of handiwork, comes within the Committee's survey. They first of all draw attention to these things, and, if they are under the control of a public authority, try to secure their maintenance as national trusts. Some 2000 drawings, photographs, and sketches have been made. But the most important part of the Committee's work is the compilation of the Register or Survey of London Buildings, which is carried on under the auspices of the County Council. The first volume, which is already printed, deals with the parish of Bromley, and the second with that of Bow. It is proposed in the third to deal with the parish of Chelsea, and a series of drawings has already been commenced. The report concludes by stating that the great need of the Committee is for more members, both active and subscribing. Mr. Leonard Courtney, M.P., presided at the annual meeting of the Committee, which was held last week. The Bishop of London having been elected President of the Committee, Mr. C. R. Ashbee read a paper which is to serve as an introduction to the L.C.C. Survey. After describing the origin of the Committee's work, he remarked that its great aim was to stimulate the historic and social conscience of the country, with a view to preventing the destruction of the historic and beautiful landmarks of the city. How necessary such a rousing of the public conscience could best be realised by the fact that in Bromley six out of the sixteen old buildings registered in 1894 had already been destroyed, while during the last six years historic relics in all parts of London had been swept away without mercy. Mr. Courtney, in acknowledging a vote of thanks, said that he felt he was in the presence of the standing conflict between the present and the past. Fortunately they could not destroy the love of the past. Ten years ago, when the London County Council was created, it was thought there could be no more prosaic body. Yet it had defied prophecy, for it had become the patron of this Committee, and was going to print its works.

Commercial Intelligence.

MR. H. ROBINS, Market-place, Wantage, has fitted up a photographic dark room for the use of customers.

THE Warwick Dry Plate Company announce that they have established a London dépôt for Warwick plates at 14, Dowgate-hill, E.C. Orders may now be sent to London or Warwick, as may be most convenient.

THE LUXIA PLATINUM PAPERS.—Owing to the unexpectedly large number of orders received, and the process of preparing platinum paper being necessarily a comparatively slow one, Messrs. Berger & Co. much regret that some delay has occurred in the execution of orders for their new Luxia platinum papers. They are, however, making all possible arrangements for obviating any such delay in the future, and hope within the next few days to be able to execute all orders promptly in the usual way.

THE NEW YORK SKY-SCRAPERS.—The Fairbanks Company, of 16 Great Eastern-street, E.C., send us a specimen copy of their Album, illustrating most of the prominent buildings of New York City. They will be pleased to send a copy of this book post free to any of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY if they will forward their name and address to the Company, who remark that, as there is some discussion at the present time in relation to the desirability of tall buildings, the illustrations might prove interesting.

THE BRITANNIA WORKS COMPANY.—Mr. E. B. Knobel, Managing Director of the Britannia Works Company, Limited, Ilford, writes us that he is requested by the Board of his Company to inform us that the agreement with Mr. Howson as Commercial Manager of the Britannia Works Company has been terminated. Mr. Howson has, however, offered to continue his duties until a suitable successor is appointed. Consequent upon this arrangement, Mr. Howson has tendered his resignation of his seat at the Board, which has been accepted with an expression of the Board's sense of his past zealous services.

MR. GEORGE EASTMAN.—According to the *Rochester Post Express*, Mr. George Eastman was born in Waterville, Oneida County, on July 12, 1854. He was the son of George W. Eastman and Maria Eastman, and received his education in the public schools of Rochester. His father was the proprietor of the old Eastman Commercial College, having removed with his family to Rochester in 1860, when George Eastman was in his sixth year. In 1861, when the family were living in the old Strong house in Washington-street, which has since become the property of the Mechanics' Institute, the elder Eastman died, and Mrs. Eastman, with her two children, removed to a house in Livingstone Park. They removed later to Elizabeth-street, then to Jones-avenue, then to Ambrose-street, and, still later, to Arnold Park. It was not until 1895 that the family took possession of the Soule House, at 400, East-avenue, which is now the family home. When George Eastman was between thirteen and fourteen years of age, he entered the employ of Cornelius Waydell, who was in the insurance business. Later he was with Buell & Brewster, and then with Buell & Hayden, both firms being in the insurance business in the Reynolds-arcade. In 1877 he entered the Rochester Savings Bank as clerk, and was successively assistant bookkeeper and bookkeeper. He left this position in 1880. It was in 1878 that Mr. Eastman began experimenting in photography with the idea of making a dry plate. He experimented in his own house at first, and began making the plates for sale while he was still in his own house. He began selling dry plates in 1880, and he was so successful with them that he formed a copartnership with Henry A. Strong, who is now President of the Eastman Kodak Company, and under the firm name of Strong & Eastman they continued the manufacture of these plates. He is now the Treasurer of the Eastman Kodak Company, the largest establishment of its kind in the world.

Patent News.

THE following applications for Patents were made between June 11 and June 16, 1900:—

DEVELOPING AND FIXING APPARATUS.—No. 10,866. "Improvements in Apparatus suitable for Developing and Fixing Photographic Films and the like." S. QUINCEY.

PHOTO-PRINTING APPARATUS.—No. 10,860. "Improved Means Applicable for use in Fastening Canvas or like Aprons employed in certain descriptions of Photo-printing Apparatus." J. HALDEN.

CINEMATOGRAPH.—No. 10,896. "Cinematograph Machine." W. CARTER.

CAMERA.—No. 10,908. "Improvements in or relating to Photographic Cameras." THE TELLA CAMERA COMPANY, LTD., and A. L. ADAMS.

COLOUR PROJECTION.—No. 10,923. "Improved Apparatus for the Projection and Superposition of the Images of several Diapositives by aid of a Single Objective applicable for Colour Photography. Complete specification. A. SAUVE."

CINEMATOGRAPHY.—No. 10,992. "A New or Improved Process and Apparatus for Handling Cinematograph and other Rolled Films." H. BREHM.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
2.....	South London	Demonstration: <i>Secco Films</i> . C. Binns.
3.....	Gospel Oak	{ Flashlight Demonstration under the Direction of Committee.
5.....	Röntgen Society	{ Annual General Meeting.
7.....	Croydon Camera Club	{ Excursion: Old Malden and Cheshington. Leader, W. H. Rogers.
7.....	Darwen	{ Excursion: Wilshire for Ribchester.
7.....	South London	Excursion: Staines. Leader, F. Goddard.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 21.—Mr. A. L. Henderson in the chair.

The CHAIRMAN referred to a difficulty often to be contended with abroad, and one which he had only recently experienced whilst staying at Nice. He passed round a negative suffering from a multiplicity of little blisters about the size of a pin's head. He was convinced that the defect was not inherent in the plate, which was not at all prone to blister. It had a substratum, but this was not the cause of the defect. He was sure of this, because the plate was one that could be developed in solutions having a temperature of 80° or 90°, without frilling, and it stood changes of temperature equally well. The blister-like spots came up principally in the washing. He found the cause of the mischief in the fact that the water service was at so high a pressure that it came out milky white, owing to the quantity of air held in suspension. The plate was kept as free as possible from the air bells, which thickly gathered on it, by continual friction with the hand, but there was no doubt that the blisters were the outcome of the condition of the water.

Mr. A. HADDON, in the course of some remarks, said that it was well known that water under considerable pressure took up more air into solution than it would if under the ordinary pressure of the atmosphere. Consequently, if the water, as in Mr. Henderson's case, be delivered at high pressure, it would have dissolved in it a large quantity of air. If, now, we put a negative to such water to wash, wherever there may be any nucleus in the film, of silver or foreign matter, there is at once a tendency for the air to separate from the water at those points. We know that the film is saturated with the air-laden water, so that it follows that, wherever the separation referred to arises, there we have formed a little blister in the film. Something of the same sort may be seen by taking a plate out of water for a time and then replacing it in the water, air bells at once begin to form. The suggestion that the water impinging on the plate, whilst charged with the air, caused the blisters directly was not a correct explanation.

Mr. J. E. HODD had noticed an effect similar to that alluded to by the Chairman when using the water coming through a fine spray, but only in the summer months. The water was served at a fairly high pressure.

The CHAIRMAN said that he had got over the difficulty by allowing the water to stand until the excess of air went off, leaving a normal amount corresponding to the pressure.

Mr. A. MACKIE had at times been unable to wash prints, so full was the water of air bells, which coated the whole of the prints. He had seen no blisters, however.

The nomination of officers for the ensuing year was then proceeded with. The following is the list of nominees, who will be balloted for at the next meeting:—*Trustees*: Messrs. A. Haddon and J. B. B. Wellington.—*Committee*: Messrs. R. Child Bayley, R. Beckett, R. P. Drage, T. E. Freshwater, S. H. Fry, J. E. Hodd, J. W. Hodges, E. Human, H. Vivian Hyde, F. C. Kellow, A. Mackie, H. C. Rapson, and J. S. Teape.—*Curator*: Mr. S. Heskins.—*Recorder*: Mr. J. W. Hodges and Mr. Featherstone.—*Librarian*: Mr. E. T. Wright.—*Hon. Secretary and Treasurer*: Mr. Walter D. Welford.

PHOTOGRAPHIC CLUB.

JUNE 20.—Mr. F. A. Bridge in the chair.

Mr. E. W. FOXLEE brought forward several samples of papers used for photographic purposes. They included a piece of Rives' paper marked B.F.K. 74, such as was used for albumenising. It cost at the time it was made 2s. 10d. per pound. Why did not English makers produce a similar paper, he inquired? He also showed another piece of Rives' paper made by the opposition concern. There was a split some years ago, the Renage people starting in opposition. Eventually the original firm bought up the new concern and combined. Some papers of the Steinbach make of various thicknesses and quality were referred to, and a piece of surfaced paper, such as was used for emulsions, was passed round.

Mr. H. SNOWDEN WARD referred to the O.W. paper, which was produced by a combine of artists belonging to the old Water Colour Society, from whence came the name. They complained that they could not get the quality of paper obtainable in olden days, and, failing to induce paper-makers to go into the question for the sake of water-colourists, a number of them, including many of the greatest names of the time, formed a company and produced the O.W. paper. Specialising as they did in this direction, he thought it likely that they might favourably entertain a suggestion to make photographic papers. He believed they made long rolls.

Mr. J. R. GOTZ said he had failed to get any paper from them when he had wanted to. Mr. Foxlee passed round a piece of Lichtdruck or collotype paper made in Germany, which, if a little tougher, should do for emulsion work, the basis of the paper being of less importance than for albumenising. The back could be seen to be very common.

Mr. SNOWDEN WARD said that a firm of Massachusetts paper-makers had been experimenting for years on the photographic problem, but, so far, they had only been able satisfactorily to make the coated papers. They had the same trouble about the iron specks. Theoretically it could be overcome, but in practice not.

Mr. FOXLEE spoke to the effect that the little iron present in our water here should have very little effect. It would not combine with the cellulose, and there was very little water left, after washing, to dry, as it was pressed out.

FORTHCOMING EXHIBITIONS.

1900.

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| July 9-14 | Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E. |
| ,, 12 | Beverley. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley. |
| August 21 | Royal Cornwall Polytechnic Society. W. Brooks; Laurel Villa, Wray Park, Reigate. |
| Sept. 21-Nov. 3 | Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C. |
| October 1-Nov. 3 ... | Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C. |
| November 12-17 | Ashton-under-Lyne. |
| ,, 21-23 | Hackney Photographic Society. |
| January 14-19 | Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B. |

Those who desire to send photographs to the above Exhibitions

should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

We do not undertake responsibility for the opinions expressed by our correspondents.

THE BRITANNIA WORKS COMPANY.

To the Editors.

GENTLEMEN.—I beg to inform you that my engagement with the Britannia Works Company, Limited, has been terminated, but I have agreed to remain at my post until my successor is appointed.

You will receive an official notice of this from the Company, but I feel that it is only fitting to you and the photographic public, from whom I have always received so much courtesy, that I should personally advise you and them of the change. I would conclude by expressing sincerely, and with confidence, the hope that the Company, with which I have been connected for over eleven years, may be as successful in the future as it has been in the past.—I am, yours, &c., JOHN HOWSON.

Brockenhurst, Coventry-road, Ilford, June 25, 1900.

Answers to Correspondents.

All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:—

J. Hamer, 64, Walmersley-road, Bury, Lancashire.—Photograph of Father Kelly.

G. SMITH.—Moisture acting on the wood might disengage some organic substance, which would certainly induce fog.

YELLOW STAINS.—A. SIMMONDS. The yellow stains on the print are not caused by imperfect washing, as you surmise, but to imperfect fixation. Either the print was not allowed long enough in the fixing bath or the solution was too weak.

HYP-O-ELIMINATORS.—W. RICHES. The best hypo-eliminator is water, and plenty of it; but the negatives must be perfectly fixed in the first instance. The hypo is then easily washed out by water, leaving nothing injurious behind.

MOUNTANT.—S. WATTS. There is nothing better than freshly made starch paste as an all-round mountant, as it has no injurious action on the prints. "Office gums," though convenient, should be avoided, as they often contain matters that would act deleteriously on silver prints.

METAL SPOTS.—R. E. SILCOX. The spots on the print forwarded are due to metallic particles in the paper. All drawing-papers, though excellent for the purposes for which they are made, are not suited for photography. The sample you have is a case in point. There are other makes with a similar surface that will answer. Try some of Whatman's make.

PATENT QUERY.—INQUIRER says: "A year or so ago a patent was applied for in connexion with an invention in which I take an interest. The patent was not completed. How can I learn what was in it?"—If the patent was not completed, the specification is not published, and the only way you can ascertain what was in it is to apply to the applicant for the patent.

STUDIO.—S. S. asks "whether there would be any advantage in having a dark passage at the end of a studio eighteen feet long in which to run the camera when required. The length of the studio, with glass, cannot be made longer than the eighteen feet."—Yes, decidedly. The dark passage will be equivalent to extending the studio by the length of the passage. Eighteen feet of glass is ample for all purposes.

DRY PLATES AT THE CUSTOMS.—TOURIST. If you have the packages labelled, "Photographic plates, must not be exposed to light," and explain the matter when the luggage is examined on the German frontier, you will have no difficulty. Better register the luggage through to your destination in Germany when you take your ticket in London, then you will not be troubled at the Belgian or Dutch customs whichever route you take.

CHEMICAL FOCUS.—H. BEDFORD. It does not follow that because the portrait lens does not work to focus that it is a bad instrument. Most of the first Petzval lenses had a chemical focus, but many of them were excellent instruments when the necessary correction was made after the image was focussed. The chief thing against them is the inconvenience.

A. C. STRUTT.—1. Theoretically such a mixture sets free a sulphur compound which attacks the image and possibly endangers its stability. 2. You probably develop too long—hence the discolouration. With regard to Ortol, you might try one on the formulae given in our ALMANAC for 1900, but we have had no practical experience of it for the purpose. We have obtained the purest blacks by using the developer recommended by the makers.

HOLIDAY.—OPERATOR writes: "Will you please tell me the rule with regard to holidays? I have been here a year at a salary of two pounds a week. What is the length of holiday I am entitled to?"—You are not entitled to any unless your employer likes to give you one, that is supposing you did not stipulate for a holiday when you made the engagement. Some, most, employers give their operators a holiday, but many do not. There is no rule in the matter.

MOTTLED PRINTS.—ALBUMEN writes: "Can you kindly tell me the cause of the mottled appearance of the enclosed prints? They show some mottling while they are printing, but much more when they are toned. The paper is —'s, and we sensitise it ourselves. It is only lately we have been troubled in this way."—The cause is obvious. The paper is sensitised on much too weak a bath. Add more silver to the solution and all will go well, of that we are sure.

VEILED LANTERN SLIDES.—W. HYDE says: "I cannot get my lantern slides clear, they are all veiled like the two sent. Occasionally I get one or two as clear as could be wished, but they are rare exceptions. Can you suggest the cause?"—The two slides sent clearly show that the plates are "light-struck," that is, they have been exposed to an actinic light either before exposure or before development. It may be, however, that they are developed in too strong a light, and so become fogged. Any how, they are fogged by light.

SALE OF BUSINESS.—W. says: "Six months ago I bought this business, the returns of which I was given to understand were 300*l.* a year. I now find they are not a quarter of that, in fact there is really no business at all. Can I compel the party to take the concern back and return the money I paid him?"—We fear not, unless you can prove there was a fraudulent misrepresentation as to the returns, and that is rather a difficult thing to do. Better consult a solicitor on the subject, that is, if the vendor has the means to refund the money.

RESTORING DAGUERREOTYPES.—F. W. TASSELL writes: "I often see in your Answers to Correspondents about advising them to place a Daguerreotype in the hands of an expert to be restored. I have one to do, and would be glad if you would kindly give the address of an expert in this business."—In reply: Some time ago, we believe, Mr. C. B. Barnes, of Alloa-street, Deptford, S.E., offered to undertake the work, but whether he is still prepared to do so we cannot say; perhaps the publication of this question will bring our correspondent the necessary information.

STAINED PRINTS.—I. CONACHER writes: "Having been annoyed for some time with stained prints, I enclose a few, in the hope that perhaps you could explain what has puzzled us for some time. They take two forms, red and blue being one, the other yellow."—We regret we cannot enlighten you. If you had furnished us with some details of your method of working, such as the paper, toning bath used, strength of fixing bath, and your mode of procedure, &c., we might possibly have helped you; but of course, by simply looking at the prints, we cannot. All we can say is that the stains are due to the manipulations.

ENAMELLED DISHES.—PLATINOTYPE writes: "We have used an enamelled dish for fixing platinotypes for some time now; but of late the enamel has become porous, and round the sides has begun to peel off. Where the iron is exposed to the acid there is a continual effervescing. I believe the combined action makes hydrogen gas, but am not certain. Is this in any way detrimental to the keeping qualities of plates, or would they turn yellow sooner?"—Certainly it is. The acid is exerting its action on the iron of the dish instead of the iron in the prints. Iron vessels denuded of the enamel should never be used for fixing platinotypes. Use porcelain dishes for the purpose if you wish the prints to remain white.

VERBAL AGREEMENT.—O. P. writes: "In March I was engaged here by Mr. — for a year certain. At the time I agreed not to enter the service of any other photographer within three miles of here until I had left the place for a year, under a penalty of fifty pounds. Last week Mr. — gave me a month's notice, when I told him that that would release me from the agreement. He replied, Oh, no, it did not, and, if I engaged with any one in the neighbourhood, he would commence an action for the fifty pounds. Can he do so? The agreement was only verbal between ourselves?"—No he cannot recover anything. As the agreement was not in writing, or duly stamped, there is no agreement at all. The threatened action is simply "bluff."

H. (H. Paddington).—1. With regard to half-tone a book on the subject by Julius Verfasser, published by Percy Lund & Co., Bradford, will give you some very useful information. This we recommend you to supplement by addressing Messrs. Penrose & Co., Upper Baker-street, Lloyd-square, E.C., who are most competent to advise you on the subject. Between the two you will learn sufficient to enable you to decide whether, it is worth your while to take up the process commercially. Here the business is "cut" badly; in Australia the scope, we imagine, is limited. 2. We have had no practical experience of it; if you intend adopting the process commercially, a small plant would not involve a very great outlay.

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EX CATHEDRÂ.

ONE of the most striking features in the west of Scotland at the present moment is undoubtedly the return by many leading professionals to what may be termed an "old fashion" in the style of finishing their productions, and this is noticeable in nearly every stage of the work, from the selection of a background to the shape and colour of the mount upon which the finished photograph remains. Not many years ago scenic backgrounds in portraiture, for instance, were voted quite out of fashion, and any one would have looked in vain for a photographer outside a third or fourth-rate position who was bold enough to continue in their use. Yet what do we see at the present moment? Why, many of the very best firms employing them whenever they can find an opportunity. In fact, plain backgrounds, with quite a number of professionals, at the moment may be said to be discarded. That several causes have contributed to bring about this change of fashion is, no doubt, apparent to any one bestowing a little thought upon the subject, and it can be clearly demonstrated to a person

walking along some of the chief thoroughfares and carefully studying the show-cases of the different leading portraitists.

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IN Sauchiehall-street, Glasgow, for instance, which has within recent years become the fashionable ladies' promenade, there are located perhaps as many, if not more, studios and photographic show-cases than in any other thoroughfare in the kingdom. And what do we find on examination of these high-class productions? Why, the striking fact that one of the undoubtedly best portraitists of the day has been bold enough to return to much that many of the "sickly devotees of the greenery gallery school" would term old-fashioned and inartistic—old-fashioned by reason, no doubt, of the taste displayed in the selection of accessories, and inartistic on the score of their productions being printed on a highly glazed sample of gelatine or collodio-chloride paper. And yet what is the result of this fresh departure? Why, large crowds are continually sun-gazing at the show pictures, and evidently admiring, beyond measure, the skill of the photographic firm displaying them.

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NOT many years ago the same firm was seen making a striking feature of platinotype, and now any one would have to look in vain among the productions shown in the streets by the best firms in Glasgow for a single show picture produced on this undoubtedly permanent printing medium. That platinotype has hitherto been a most popular printing process with many workers, no one will deny, but still the public has never entirely taken to it for portraiture; and even with several of the best amateur workers we now see this excellent printing process being more or less discarded for good old carbon, as was strongly evidenced at the recent exhibitions. On the other hand, autotypes or carbon prints are much in evidence in the show-cases of the leading professionals—a striking proof of the great beauty of the prints produced by this delightful process.

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ANOTHER striking feature in the various specimens at present being publicly displayed is the "individuality" shown by different professionals. This is seen in the selection by

different workers of one or other of the more modern printing papers, such as Gravura and others of the same class, while there are not wanting those bold enough to resort to good old albumen in the printing of their specimens. The one chief feature, however, would appear to be the discarding of the colder tones for the rich, warm browns and sepia in carbon and gelatino-chloride, &c. It is not only, however, in the return to much that is old-fashioned in the way of backgrounds that the present style is tending. There is also a striking innovation, not only in the shape of the mounts, but likewise in their colour. In no single instance, from among the large number of professionals who have recently exhibited their spring show-case, do we find a single specimen of the old style of cabinet mount, carrying the picture well up to the edges of the card. The present fashionable mounts would appear to be those having an embossed *circular* centre. Think of it, ye would-be "Dictators in Art," the present most fashionable shape is actually a circle, while, as to colour, the clean, white margin has actually displaced the brown-paper imitations of recent times, and even kahki is somewhat stale.

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ANOTHER very striking and sensible fashion, which may in a sense be termed an "individuality" on the part of one of Glasgow's portraitists lies in the production of large carbon prints having a wide white-paper margin. These are very high-class productions, and range in size from 12 x 10 to 15 x 12 inches, and carry all round a margin of about four inches of white paper. These high-class photographs are neither framed nor mounted in any way, but are displayed just like an unframed engraving, and in this respect they prove a striking feature, contrasting favourably with the sombre carbon prints framed without any margin in ridiculously common stained wooden frames, which a few of our boasted exclusive modern school deem so artistic.

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DURING recent years not a few writers have thought fit to air their opinions pretty freely both as to the shape as well as the most artistic manner of printing and finishing a photograph, and this sort of thing has entered largely into almost every branch of photography, lantern slides and their masking being no exception, circles in every instance being tabooed and deemed inartistic, and not nearly so "tony" as certain other shapes; and now we see that there are those who can, like Mr. Fred York, see some reason and even beauty in employing and exhibiting a lantern slide or silver print in a circle mask or circular form of mount. The truth is, in photography, like so many other departments of social life, there enters what must be called a strong fashion for the time being, and as yet there is no actual focus or centre from which these fresh departures in style emanate. One year we see a sickly running after a spurious style of would-be art, the next we see a return to a more sensible state of things, which was good enough for our grandfathers in bygone days, and then, again, we see the traces of would-be art being kicked over by some leading firm bold enough to adopt a style simply because the public like it and will have it. As yet the general public is certainly not educated up to much that many of the more "secluded set" deem "art in photography," and so long as common sense animates a buyer, and he buys and orders on the strength of his own taste, and not that of others, so long will there be found those bold enough to produce that which is pleasing to the public, simply by reason of the fact "that he who pays the fiddler chooses the tune."

THERE are those, no doubt, who will deplore that so much of this sort of thing is to be found, and who allege that no actual progress in photography can take place until photographers recognise that their productions must conform to certain narrow lines which they deem artistic, such as the abolition of all highly glazed printing papers, as well as an out-of-focus fuzzy effect in their prints, and the production of pictures the chief feature of which lies in false lighting and striving after so-called "pictorial effects." On the other hand, there are those bold enough, and who recognise that one of the cardinal points in photography is "truthfulness," and that photography in its proper sphere is not, nor ever can be, elevated to the lofty pinnacle of so-called art, but that it is a household necessity! Of this there can be no doubt, and, so long as the public desire a glazed print and absolutely sharp productions in commercial as well as other pictures, so long will there be found photographers willing and sensible enough to cater for their taste in a purely business-like manner.

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BUT what about permanency is the question that naturally follows the adoption of some of the modern printing mediums? No doubt, in former times, when only single albumenised printing papers were employed, a much greater degree of permanency was obtained in the photographs supplied to the public, but this was, to a certain extent, attributable to the treatment those prints received at the photographer's hands. At that time it was well recognised that, by subjecting all prints to a suitable "salt bath," and printing to a depth that permitted of the print being thoroughly fixed before any injurious effects to the image was contracted, those photographs were practically permanent, and it is still claimed that this mode of treatment is quite as efficacious with modern printing papers as was then the case with single albumenised samples. The truth is, much depends on the treatment the photographer bestows upon his prints, and this is clearly seen in scrutinising the productions of photographs taken years ago. In several instances, alas! the fading is only too apparent in the productions of certain workers; while, on the other hand, the productions of other houses are strikingly free of deterioration after a lapse of nearly twenty years. And here have we not something to reflect upon? That one leading photographer in the West of Scotland always insisted upon the salt bath being used between the operations of toning and fixing is well known to old workers in the district, and now we can point to the fact that, in every case, the prints that passed through his hands are practically permanent. Permanency, no doubt, is of paramount importance, and many conscientious photographers are found discarding any process liable to give out in this respect. To say, however, that all highly glazed samples of paper are lacking in permanency is going too far, and the public realise this well enough.

THE AVOIDANCE OF GRANULARITY IN COPYING.

In copying a photograph or other picture on paper in which the grain or texture of the paper is distinctly visible there are certain well-recognised methods whereby the grain or other rugosities may be made to disappear in the copy when this is produced by means of photography, even the very coarsest samples of drawing or water-colour papers being amenable to certain conditions of working.

Any one who for the first time attempts to copy subjects of

this kind may very possibly fail to produce a result that does not show more or less strong resemblances to the texture of the paper picture he has copied, and this notwithstanding that he has followed closely the instructions given by practical workers as how best to avoid this granularity in a finished print, and, as a natural consequence, the writers are blamed for misleading novices in this particular branch of work. But why should such failures occur? This question is easily answered. As a rule these failures do not arise from any actual error on the part of the operator in his *modus operandi* of copying, or from his having followed out erroneous instructions, but more frequently from the simple fact that mistakes are made in differentiating between what is actually the grain or texture of the paper and that of a surface that is in a damaged condition. A simple example may be cited in explanation of the difference between two such cases. Take, for instance, the case where a photographer is called upon to make an enlargement from, say, a *carte-de-visite* size of photograph, executed probably thirty years ago (and this is by no means an uncommon case). Such pictures will almost certainly be found printed on a sample of albumenised paper known at that distant date as "single albumenised," and, according to the chance treatment the photograph may have received all down the long term of years since it was produced, will be handed to the photographer in a greater or less degree of imperfection by reason of the amount of carelessness displayed by the owner of it not protecting it from damage. This deterioration will be apparent in more ways than one. In the first case, a distinct want of brilliancy in the surface of the paper is almost sure to be noticeable, and very probably also the photograph may be more or less discoloured through the lapse of years since it was taken.

To an ordinary observer these two defects may appear all that is wrong with the picture; but to a practical worker, who has learned much from having to deal with the copying of subjects of this description, there is a third, and more serious, defect in the photograph, more serious in so far as it affects the operation of copying in a marked degree. This defect assumes the form of having the skin or surface of the sample of single albumenised paper more or less abraded, a condition which makes it very difficult to deal with in copying by means of photography. Nor is this to be wondered at when it is considered what an amount of attrition a paper photograph receives at the hands of people during its lifetime. Very probably every time it has been taken in the hand for examination a finger will have been passed over its surface by thoughtless people, who never for a moment dream of the damage they are doing a picture; and this continual attrition or rubbing of the surface of a photograph soon becomes apparent to the practised eye of a clever operator, who can detect in a moment what others never think of as a defect or deterioration, and hence, when these pictures reach the hands of a photographer for the purpose of copying and enlarging, we hear such remarks made as "That's a bad one."

Pictures, and photographs especially that have suffered by reason of attrition, are not easy to copy by means of photography, and it is just such examples as these that give rise to much disappointment and at the same time discontent, on the part of those who feel they have followed closely the instructions given from time to time in the columns of the photographic press by writers of experience.

It does not require much consideration on the part of a

thoughtful student in photography to see at once that there is a marked difference between copying a subject in which the surface presents an appearance, and is composed in reality of nothing but ordinary texture like a sheet of paper and that of a case or subject totally different, and which, in reality, is not, in a proper sense, texture at all, but consists of very minute and distinct contrasts composed of a partially intact amount of the original photographic image and a proportion of surface where no such original image longer exists, and which has been removed by friction. Such defects are not properly termed granularity, or, at least, if so, only in a very secondary degree. They are more properly classed as contrasts in colour, and cannot be dealt with by means of photography on the same lines as when treating an ordinary case of granularity.

In contrast to this, let another case be noted, and this time, say, an operator is called upon to photograph a wash drawing, or other similar subject, contained in a sample of the roughest possible drawing-paper. Here we have a case where there can be no possible doubt about the amount of texture present, and it is just about ten to one, were the novice asked which of the two subjects would copy best by means of photography without any grain being visible in the finished print, the answer would be, "The *carte-de-visite* subject, certainly." To a practical worker, however, it is all the other way about, simply because he knows that, by following out certain well-known methods of procedure, texture can be easily dealt with; but not so subjects in which the apparent texture is not grain in reality, but rather a series of contrasts in colour between that of the paper surface and the remaining photographic image.

The first consideration, therefore, when work of this description has to be undertaken, is to determine whether the original photographic image is intact, or whether it has suffered by friction, so that part of the image has been rubbed away, leaving the most minute portions of paper only. A fruitful source of damage to silver prints in this way arises from the careless dusting of a sitting-room in which photographs are lying on tables, &c., as articles of ornament.

From time to time several methods have been advocated for avoiding the appearance of grain when copying photographs or paper surfaces. Among the earliest may be mentioned what for a time was looked upon as a trade secret (for old collodion-workers kept it well up their sleeves). This method consisted in copying such subjects in varying planes of focal lengths by means of a lens through the camera, which was capable of being altered in focus by racking in and out the sensitive plate at the rear. First of all the picture was placed *in situ* in daylight, and most carefully focussed on the ground glass of the camera; an exposure of about half the necessary amount was accorded to the sensitive plate at this plane. The rack and pinion of the camera were then, after capping the lens, made to withdraw the sensitive plate to a distance very slightly beyond the true plane for the sharpest focus; at this point a brief exposure was also given to the plate, the lens capped, and the camera racked inwards to a corresponding distance in front of the plane of true focus, and a brief exposure given at this point also.

On development a perfect result will be found, providing proper attention has been bestowed upon the lighting of the picture. One thing, however, must be noted, viz., when this method of copying is resorted to, the alterations of focal

planes must be effected by means of a camera, whose rack and pinion is operated upon *in the rear*. The distance between the lens and the subject must not be tampered with in the slightest degree, and in this we have another proof of the deficiency in modern apparatus. Cameras are now made in thousands where utility is sacrificed entirely to portability. This we see in the new form of camera, in which focussing is done by altering the distance of the lens from the subject, instead of providing for its being possible both in front and rear.

Another method adopted by workers many years ago was that of interposing a thin, transparent film between the partially printed proof and the negative after the latter was in the printing frame. This method, however, was not so easily accomplished by reason of the difficulty of correctly registering the prints. Such manipulation, however, can be accomplished, provided a few simple precautions are taken when inserting the negative in the printing frame and the placing of the sensitive paper in contact with it.

In copying pictures having paper supports there is no doubt the chief item lies in properly lighting them. It is quite surprising the difference in results obtainable by varying the disposition of the picture in regard to the source of light. This any one can prove by a few simple experiments. A strong side light will, of course, be the most unsuitable whenever it is desired to suppress grain in a photograph. The best results are certainly obtained by placing the picture *in situ* in front of the full light of a north window. A very good test object for an experiment will be found in a sheet of coarse drawing-paper. Let this be photographed with a dead side light, and then with a full front light. On comparison very striking differences will be apparent.

A photographer, however, is frequently called upon to execute work in which the greatest amount of surface rugosities is required, such as when an imitation in paper of such articles as morocco leather or crocodile skins is required. In such cases a front light would be fatal to success, and only a concentrated side light of narrow dimensions should be employed in photographing such subjects.

Exposure also forms a very important item in suppressing grain. This should be full, or verging on what may be termed over-exposure. Where the utmost amount of rugosity is desired, it should be just right, if anything erring on the side of under-exposure.

Long-focus lenses should be employed in all operations of copying, the reason for this being, that reflections are not so liable to reach the sensitive plate when they are employed as is the case with short-focus objectives.

With highly glazed gelatino-chloride papers there is no difficulty as regards grain, but sometimes trouble arises from reflections. Such samples are best dealt with a side light, seeing there is no grain and long-focus objectives will permit of any reflected light passing outside the angle of view of the lens, provided the lighting is properly looked after.

Some workers advocate the placing of scrap photographs in optical contact with the glass as a preventive of grain in copying. No doubt, holding the photographs *in situ* in this temporary manner whilst they are damp is often very convenient, and this simple plan has much to commend it, especially where the photographs have been kept in rolls. The damping keeps them nice and flat, but it is questionable if the method reduces the grain, which, after all, is only overcome by correctly lighting the subject.

The Royal Observatory.—The annual inspection by the Board of Visitors of the Greenwich Observatory, which is usually made on the first Saturday in June, took place on Tuesday last week. The postponement of the visit was due to the recent eclipse of the sun disturbing the usual routine of the astronomical world. Each annual inspection reveals the fact that photography is being more and more extensively utilised in connexion with astronomy. One very interesting exhibit was the photographs of the solar corona and those of the solar spectra taken at Ovar, Portugal, during the late eclipse. These, though not showing, perhaps, quite so much detail as the corona taken in India in 1898, yet still form a valuable contribution to solar science. In another room there were on view some excellent photographs of nebulae and double stars taken with the large equatorial telescope which Sir Henry Thompson presented to the Observatory, and, also, specimens of the astrographic chart which Greenwich is making in conjunction with the other observatories.

By the way, it is to be hoped that every precaution will be taken in the production and preservation of these negatives, which are gelatine ones, in face of the statement that, in some of the negatives taken only a few years ago, many of the fainter stars have disappeared. Would it not be well to reproduce the negatives by the collodion process, or, at least, make transparencies from them by that process? The collodion process is unquestionably a permanent one when only ordinary care is exercised in its work. Our suggestion, of course, applies to all observatories that are expending years of labour in charting the heavens. If that were done, we should advise that cyanide of potassium be employed as the fixing agent, and not "hypo."

WHILE on the subject of astronomical photography it may be mentioned that, at the meeting of the British Astronomical Association and the joint meeting of the Royal Society and the Royal Astronomical Society last week, a large number of reports had been received from the observers who went to Spain, Portugal, Algiers, &c., all of which were of a very satisfactory character, several fresh phenomena being observed. It is very doubtful if any previous eclipse has been favoured by such excellent weather at all stations as this one was.

Air in Water.—At a recent meeting of one of the London photographic societies this topic cropped up. It is tolerably well known that water, at high pressure, often contains a considerable amount of air which is liberated when the pressure is reduced—often to cause trouble in photographic operations—possibly in nothing so much as in the carbon process. If the tissue, after exposure, be mounted on the support with such, water blisters are very likely to arise by its expansion when the picture is developed in the warm water. We have seen water drawn from high-pressure mains, particularly after repairs had been made in the pipes, that had the appearance almost of whitewash, but, after standing for a few minutes, it became perfectly clear and bright. Indeed, it might be compared to a bottle of ale, highly charged with carbonic acid, when first opened, which, though cloudy at first, quickly becomes bright and clear as the gas liberates itself. It is only when the water is drawn directly from the mains that the air it may contain is likely to cause trouble in photography. That will not be the case when the water is drawn from the cistern, as there, the pressure being taken off, the air soon escapes.

Hertford House and the Wallace Collection.—The art collections at Hertford House, the munificent gift of Lady Wallace, is now open to the public. Probably this is the richest gift the nation has ever received from a single individual, for not only are the art treasures given, but also the magnificent building that contains them, in Manchester-square. The art treasures consist of furniture, china, armour of different dates, paintings, &c. It is the latter that will, no doubt, interest the majority of our readers most, for in this collection every school is represented by some of the finest work in this country. Amongst these are paintings by

tubens, Van Dyke, Gainsborough, Rembrandt, Sir Joshua Reynolds, Turner, Greuze, Cuyp, Metsu, Jan Steen, &c. From the pictures and works here shown, photographers who study art—real art, and not that affected by some pseudo “artists,” by means of bad photography—may learn much, as indeed they may from any fine paintings. The collection is open to the public free on Mondays from two till six; Wednesdays, Thursdays, and Saturdays between ten and six; and on Tuesdays and Fridays between the hours of eleven and five, on payment of sixpence. The collection will also be open free on Sundays up to the last Sunday in October, between two and six, or two and five, according to the season. Thus employés and others who cannot get time on week days will have the opportunity of visiting the Wallace Collection on their only leisure day.

Forgery and Photography.—We read that a large number of forged Bank of England and Irish notes of 5*l.* and 1*l.* respectively are in circulation in Ostend and other Belgian towns, as well as in Holland. Now that the tourist season is on, it is probably the time such forged notes are most likely to be put into circulation, and accepted by the unsuspecting. Unfortunately for their credit, photography or photographic methods have been the basis of the greater majority of the forgeries of later years, alike of British and foreign bank notes, though it was more or less successful even in the earliest days of the art. It is easy to understand that on the Continent, where English bank notes are generally looked upon as being “as good as gold,” many may be passed on the unsuspecting; but it does not follow that the forgeries were made in this country; more probably they are produced abroad, if not, indeed, in the country in which they are passed off. Anyhow, English tourists are scarcely likely to be victimised by them, because, when they visit a bureau-de-change, it is to get gold for notes, and not notes for gold. Furthermore, an Englishman is not likely to be deceived by these spurious notes, which, we learn, are clumsy imitations of the well-known Bank of England paper.

PARIS EXHIBITION NOTES.

I.

The man or woman who sees the whole of the Universal Exhibition with which France—or, shall we say, Paris, the glittering Shrine of Pleasure?—closes the most turbulent century of her history, will have accomplished a very great feat. We are inclined to think that, when next autumn the housebreaker has knocked down the miles of graceful palaces on both banks of the Seine; the last visitor has taken his last look at the figure of the Parisienne, who, from the summit of the main entrance on the Place de la Concorde, stands inviting with all her heart the world to come and see the wonderful show which the genius of French administrative ability, undaunted by the threatening political outlooks at home and abroad, has got together; that when the turnstiles have ceased revolving, and all the remaining interest of France in her Exhibition is centered in the final arithmetic of the speculation, then, even with the amount of exaggeration that is permissible in the language of retrospect, few will dare claim to have “done” the whole of the Exhibition. It is probably the largest thing of the kind the world has yet seen, and, from the point of view of the visitor, the worst arranged. The patriotic Briton, for instance, who wishes to glance at the productions of his beloved homeland, must be prepared to undertake a considerable amount of pedestrian exercise in the quest. A photographer would naturally wish to look at the English photographs and the English paintings. At a rough guess, something like a mile separates the two sets of exhibits!

This idea runs throughout the entire Exhibition, which has been arranged on a decentralising plan. Each country is represented by its own pavilion in the Street of Nations, but its exhibits are scattered in various parts of the Exhibition. This system precludes the subdivision of the Exhibition into classes, and the result is that a wish on the part of a visitor to study the world’s productions in one particular branch of industry can only be gratified at the expenditure of a great amount of time and trouble.

Paris within the last few days has been crowded with German and American visitors. Of the many scores of cameras that we saw in the grounds of the Exhibition, very few indeed were carried by

English photographers. The holiday months of July, August, and September will probably provide the majority of English photographers who intend visiting the Exhibition with their opportunity of doing so. Let us give a few hints for those who may wish to do work at the Exhibition. In the first place, the visitor must be prepared to enter a world of magnificent distances and lofty buildings. The intelligent photographer will have no difficulty in realising what this means. He must go provided with a series of lenses increasing in length of foci from three or four inches. At one time he may find himself working at very close quarters, as, for example, in the splendid Rue des Nations, where the gorgeous international palaces stand all together, and it is impossible to place the camera at more than a few yards’ distance from any one of them. So, too, in the Oriental villages that cluster about the Trocadéro, this exceedingly picture-que “food for the camera” will also necessitate the use of short-focus lenses. The river intersects the Exhibition, and from either bank fine views of the bridges and palaces are to be seen. Then there are the wide vistas of the Invalides, the Champ de Mars, and the incomparable panorama that is seen from the Trocadéro, where the whole glory of an architectural paradise stretches itself out at your feet. To get photographs of these subjects at all satisfactory in size, lenses of considerable focal length are obviously essential.

The charge of a pound a day for the use of stand cameras in the Exposition appears, so far as we could judge, to confine large work, say, 12×10 and upwards, to local professional hands. From a business point of view, one pound a day or forty pounds for six months is a considerable risk to run unless the photographer has a commission to execute at prices which will allow of this very heavy tax being added to the cost of producing the negatives without diminishing the profits. We cannot imagine any professional photographer parting with his daily pound purely as a speculation.

It can easily be supposed that hundreds of thousands of hand cameras have been and are used at the Exhibition. At the time of our visit they stared us in the face at every turn, but the excellent friend who accompanied us, and who had been doing photographic work in the Exhibition since its opening in April, assured us that in May and June there were a great many more cameras to be seen.

Photographs of this vast place, taken in small hand cameras with lenses of four or five inches focus, have a disappointing and dwarfing effect. We saw many stand cameras held in the hand, in size from half to whole-plate, and this hint we would recommend the English visitor to bear in mind. The Exhibition is on such a scale of grandeur that only large direct work can do justice to it. The hand-camera man who confines himself to small negatives with a view to subsequent enlargement may be wise in doing so, but he sacrifices the panorama-like effect which only large direct work can properly give, and which constitutes, in our opinion, one of the chief features of this wonderful Exhibition, that it should be the aim of photography to suggest.

After ten o’clock in the morning the opportunities of taking photographs in which figures do not show are few, for the human flies swarm over the place in hourly increasing thousands. The Exhibition opens at eight in the morning, and between that hour and ten the photographer will find his best chances of securing views in the grounds. Later in the day photography, except from the bridges, becomes a matter of great difficulty if it be desired to exclude figures. These hints are penned for the benefit of the serious worker who wishes to secure good photographic mementoes of an Exhibition which it would be difficult to excel in point of interest, and the like of which human eyes may not look upon again.

Of course, the “snap-shotter” will find himself in his element, but we would caution the English visitor against indiscriminate photography amongst the people in the grounds—men and women of all nationalities are there, and there is a bewildering variety of Oriental costumes. The foreign photographers appear less prone to indulge in the gentle practice of photographing one another than are their British *confrères*. In Paris just now it is impossible to escape the fact, unpleasant though it may be to have to recognise it, that English people are not the favourites of their hosts. The reasons for this disagreeable state of things are not the natural subject matter of a discussion in these pages, and we make the reference

only for the purpose of advising British photographers who may be using their cameras at the Exhibition or in Paris to be wary in not giving possible causes of offence to strangers by taking photographs of them in a furtive manner.

The bad odour in which most things English are held in Paris at this time is no doubt deepened by the very poor support which the Exposition has received from this country. In this respect Great Britain comes out very indifferently. She is represented in the industrial section by, we believe, under four hundred exhibitors. Germany has sent the grand total of 7000 to take part in the Paris show. Indeed, it may be said that the Fatherland and the United States divide between them the chief honours of the Exhibition.

And, as if this paucity of British exhibits were not enough to humiliate the visitor from this country, he is further reminded of the poor figure cut by the United Kingdom at the Exhibition by the apparent lack of any effort on the part of our Royal Commission to secure some decorative effect in the display of those exhibits which permit of it. Everything has been left to individual effort, which has seldom soared above the friendly help of Drew & Cadman. Things are vastly different in other countries. Government co-operation has been freely bestowed. The pavilions are tasteful in design and execution. Each exhibit is part of a general scheme of colour and structure. Little Switzerland, for example, shows her photographic productions in a beautifully designed pavilion, which would not look out of place in a fairy scene, it is so graceful and airy. But poor British photography! It is placed upstairs, and is displayed on wooden screens, whose severity of design and colour might be appropriate enough in the British Museum, but which look inexpressibly shabby and dingy amidst surroundings so beautiful as those in the building on the Champ de Mars. Why, the *tout ensemble* of a Pall Mall Exhibition is an aesthetic dream in comparison with the paltry style in which British photography is shown at Paris.

The fault of all this may not rest with those responsible for the management of the British section at Paris; although there is some reason to fear that the high and dry officialism with which the name of South Kensington is so unhappily associated in this country is at the bottom of it. Look at the charming system of administration adopted in the case of the English House in the Rue des Nations! This latter is one of the most popular features in the Exhibition. It is a street of gorgeous national palaces open to free inspection, with one exception—that of the English house, of course! To this building, which, if the truth must be told, is about the poorest and tiniest of the series—an old English house is all very well in its way set against an English landscape, but it looks very mean when surrounded by the stately and ornate palaces which Italy, Germany, Belgium, and many other countries have raised—the British visitor naturally makes his way at some time or another, and, of course, numerous foreigners want to have a look at the inside. But to an inspection of this English House, officialism ingeniously places obstacles which would do honour to the wooden-headedness and perversity of a Somerset House clerk or a high-salaried *employé* of the Circumlocution Office. The English house is not open till two in the afternoon, it is closed on certain days in the week, and you are only admitted on presentation of a ticket obtained in a part of Paris a mile or two away! This is what you learn after having travelled perhaps two or three miles from your hotel along the noisy streets, and covered, may-be, a mile in the Exhibition grounds. Could anything be more exasperating? Nearly all the other palaces are open to you; freedom to wander among the priceless treasures of the main buildings of the Exhibition is yours; you can put your eyes as near as they are to this page of print to diamonds valued at a quarter of a million golden English sovereigns—revel, in fact, in close proximity to a great blaze of gems fit for a dozen queens and empresses; the pictures, the tapestry, the sculpture, the magnificent china are yours to look at all day; but you mustn't go into the paltry little English house with its by no means exceptionally attractive furniture and pictures, until half your day has gone and then only by ticket obtainable miles away. It is just for all the world as if a man ran down to Hampton Court Palace only to find that he had to trapse back to Richmond for a ticket!

ON THINGS IN GENERAL.

I RECOMMEND those of my readers who have not already taken notice of it to carefully read Mr. Archer Clarke's paper on "Reducing Over-printed Paper-Bromides," in the June 22 number of this JOURNAL. It was founded on a reply of the Editors to the effect that it was best to do another instead of troubling over the matter. I think I myself once suggested that the furnace for waste silver paper was the best treatment. I still think so. The Editor referred to over-printing, which term is usually applied to printing out, Mr. Archer Clarke to over-exposing a bromide. This is by the way, and, whatever the text, the writer gave a capital sermon full of useful hints. He does not refer specifically to either portrait or landscape work. I am inclined to think the former was in his mind for a slight removal of the more delicate tones in such prints if it took place (and I am inclined to think it would occur) would be less likely to be observed than if a portrait print were operated upon. There is one point in Mr. Clarke's paper which points to an experience opposite in character to my own. He says, referring to a recommendation to use "the well-known Howard Farmer reducer of ferric prussiate potash with hyposulphite of soda," "Now, this cannot be used satisfactorily with paper, as it stains the whites." Now, I have used this reducer for bromide prints on very many occasions without ever observing the ill effects referred to. Old wet-collodion workers know all about the dangers of cyanide; but, as they nowadays form a very small minority of the genus photographer, it may be well to emphasise the fact that it is a very deadly poison; the stock solution described would be about as deadly as prussian acid. Further, the fingers should never be permitted to be in contact with the solution if there be the slightest cut or abrasion. Its absorption under such conditions might be rapid and highly dangerous.

An inquirer, "Platinotype," has been writing to the Editors, asking about an enamelled iron dish which had its coating chipped away, and the iron gave off an effervescence when the acid touched it. He wanted to know if the dish would do any harm to "plates" (presumably a slip for prints). Really, it is extraordinary what questions some people will put. How any reasonably intelligent man could care to use a dish under such conditions is a problem beyond my power to solve. I may take this opportunity of saying that enamelled iron dishes should never be used for acids. There are, no doubt, many makes of these dishes, but in all my experience I have never yet met with one which would not be acted upon by hydrochloric acid. These operations in platinotype work should always be carried on in an earthenware (so-called "porcelain") dish.

It is an actual pleasure to read of some one wanting information about albumenised paper, that beautiful process about which so few modern photographers know anything whatever, and still fewer as to how to sensitise it themselves. The Editors have hit upon the cause of an inquirer's difficulties: a dozen or more sheets of paper floated in succession, the first good, the last two or three bad. The floating of the paper takes up a portion of the silver, and leaves the surface portion of the liquid that much poorer in silver. This goes on till at last it is too weak altogether. The inquirer is directed to stir up the bath so as to equalise the strength. As a matter of fact, the dish should be gently waved to and fro several times between the floating of each sheet. A solution of silver nitrate has a considerable specific gravity, and it is quite a singular phenomenon to observe how two solutions, or plain water and a solution of silver may be placed in one vessel and remain unmixed. I have seen a Winchester of silver bath made by first dissolving, to the extent of 20 grains to the ounce, in a bottle nearly full of distilled water, and then made up to 35 grains by adding about 10 or 12 ounces of very strong solution. I have then seen the Winchester turned upside down twice over to mix the solutions of differing density, then put aside for a week or two, and finally seen half the bath poured into a glass bath, and prove so weak as to be useless. The strong solution was so heavy that most of it sank to the bottom, notwithstanding the double upturning, and remained weeks, and would have remained months, without equalising itself. This may appear incredible, but I repeat I have seen it.

In Our Editorial Table in these columns there was recently mentioned what I take to be an exceedingly useful work—"A Profit and Loss Chart" for the use of works managers. The editors say, "Works managers should find the book of the greatest use," and I could think they are quite right; but, if the publishers, Messrs. Percy Lund, Humphries, & Co., would only get some one to compile such a book for managers on a smaller scale, to wit, owners of a photographic studio, they would confer a distinct benefit on a worthy class of professionals. How many photographers are there who, nay, are capable of keeping, a businesslike profit-and-loss account? The result of such lack of business knowledge is seen too often in the commercial lists which spell disaster, and are always such reading, showing blighted hopes and wrecked ventures. The profits to be made from running a photographic studio are sadly below that is popularly ascribed to them, and are only discovered usually when a man, say of undoubted ability and taste, starts a studio on a small capital. He runs it for a year, does a fair amount of business, draws what he thinks a moderate sum for his profits, and finds at the end of a short time that he is virtually bankrupt. Such a book as that referred to, simply arranged, would show where the expenses and the leakages came in, what the probabilities of profit were, and whether the former could be curtailed sufficiently to leave a margin worth living or working for. The lamentable failures that many earnest and good workers have made in their business essays is an object-lesson that should add double force to the recommendation to employ some such system. Cognate to this question of the business aspects of photography is one referred to also in recent Answers to Correspondents. The inquirer had made a year's engagement verbally, and an agreement not to take employment in the district under a penalty of fifty pounds. To the employed I would say, attend to the advice so often given in the column I refer to, and remember that any engagement for a specified period is virtually worthless unless written, duly signed, and, preferably, "witnessed" and stamped with a sixpenny stamp. Further, to employed and employer I would say that any clause in an agreement whereby a penalty is to be paid or a forfeit made if certain conditions are infringed is, even if written, signed, witnessed, and duly stamped, absolutely worthless and incapable of being enforced unless drawn out in a particular way, or with certain additions which I will not particularise, as any such document ought to be made out by a solicitor unless the parties to it are expert business men.

The question of "Is photography a fine art?" has, by tacit consent, been laid aside for a long time, and I am not purposing to open it; but what might be termed a side view of the question came up recently in a very amusing manner. The attendant at an automatic photographic machine applied to a magistrate for a summons against his employer for a fortnight's wages. This man clearly thought himself an "artist." His work consisted in pulling the string and wrapping up the portraits, but he was very indignant at the magistrate's suggestion that no skill was needed. The soul of the artist was at once aflame. "Oh, yes, but there is," he replied. Alas, poor artist! That sealed the matter. If he had only looked upon himself as a mere labourer, he would have had his summons or nothing; but, as a skilled workman, he must apply to the County Court for his summons, and pay the usual fees.

I find I am rather tangled up with artist ideas, and can't free myself of all references (my readers need not be afraid, I am not going to start the old controversy), for I noted an extract given a short time ago from a well-known art critic's remarks. From the paragraph I re-extract the following: "Photogravure is a mechanical process, and no artist comes in between the painter and the reproduction." Doesn't he? Engravers are allowed to be artists and I should like to see the photogravure in which no such artist, at any stage of its production, has had a hand in the matter in his own particular line.

I was much obliged to Mr. Frank Bishop for his drawing attention to what he justly terms a funny error of mine in re Copyright

Acts. The real truth is, most of that lucubration was written while I lay ill in bed. I have unfortunately been a martyr to repeated attacks of "flu" of late, and have had to employ an amanuensis at times, who, on the occasion in question, beautifully mixed up my past and present memoranda on the subject dealt with.

FREE LANCE.

THE PHOTOGRAPHER'S YEAR.

JULY.

JULY, spite of the longest day being in the possession of June, is the hottest month of the year. In the heat and languor of the town thoughts turn more readily in this month to the cool, loose idleness of a holiday than at any other time. The touch of fickleness that the weather shows in June has also passed away, and the continuance of a spell of fine weather becomes more assured, an important consideration in its bearing upon the enjoyment of a holiday. Photographs in the month should be holiday pictures. They should also turn out the best of the year, for, in addition to wealth of novel material, there is fulness of leisure rarely possible at other times to a busy man. The photographer has a very great advantage as a holiday-maker in the possession of his hobby, light or earnest as he chooses to make it. In all anticipations of a holiday, wherever it is to be spent, one essential is idleness, if not of both body and mind, at least of mind. It is the natural reaction from over-much or long-continued work. The doctor, engineer, and shopkeeper, tired out with busting about for ten or twelve hours out of the twenty-four, think of rest as the leading feature of enjoyment. Thoughts wander to cool seaside rocks, hammocks swinging under shady trees to the murmur of softly running streams, and elastic couches in scented heather. There will be no patients to see, no night bell to answer, no job requiring personal supervision, no exacting customer to attend to.

Where the ordinary work is sedentary, and bodily tiredness not so much felt, as in the case of a lawyer, banker, or insurance agent, the holiday may take the form of a cycling tour, sailing cruise, canoe trip, or fishing expedition; but, if there be physical labour in it, there will be no mental work. The intricacies of law, money, and life tables are to be thrown completely out of the mind for the time being, and the luxury of no books, or only those in the lightest vein, indulged in. Fine anticipations and resolutions, but how do they turn out in practice? As a rule, unsatisfactorily. The busy man finds his holiday, after the first two or three days, palling upon him. He cannot lay himself in soak in idleness. The novel is trashy, the newspaper he has been accustomed to skim over in a few minutes cannot suddenly be made to last out two or three hours' reading, the time between meals seems very long, and the evenings are dull. Accustomed, during fifty weeks of the year, to a certain groove, he cannot, in the odd two, travel with comfort and pleasure in a totally new one. A sneaking longing for the flesh-pots of the city steals over his soul, becoming more and more pronounced as his absence from them lengthens. When free to return, he does so with a higher opinion of Adam as the originator of work, and the conviction that it is a blessed institution, after all. It may not go to this length with all, but, with few exceptions, holiday-makers would be much the happier for something to think over and do. A diluted continuance of ordinary work is out of the question. It must be change of work of not too severe a type, readily and agreeably taken to. Photography fills the want most admirably. Photography, that is, to one who has some natural artistic inclinations, and who can crystallise out a vague feeling of pleasure at his surroundings into the selection of a definite object that acts most suggestively as its central essential.

To take an instance to prove this point: One has elected, say, to spend his holiday at the seaside. There are certain to be some regularly recurring incidents in the life of the place that appeal more particularly to his fancy and liking, which he finds himself on the look-out for, and making something of an effort not to miss. It may be the return of the night fishers to the beach in the morning, or of the day fishers to the harbour in the evening, the caulking of a boat, tanning nets, the coast guardsman on his round, or what not. These are the things which, suddenly presenting themselves by some association of ideas to the memory later on in the year, recall most vividly the air of the place, and serve to give point to the pleasures of recollection. Every sensible man, wishing to get as much out of life in the way of pleasure as he possibly can, will do well to encourage the easy remembrance of such past pleasures. And the quiet pleasures that have had the time and opportunity during a holiday to incorporate themselves insensibly with the nature of their recipient have this marked advantage of one more keenly felt at

the time, that they are recalled more readily and with greater satisfaction. The indefinite recalling, indeed, is often felt to be a greater enjoyment than the original one, and even make a pleasure of what we were hardly conscious of as such at the time. It has the charm of distant music heard over still water. Time, like the water, has absorbed the harsher or discordant notes. Nature does her best to help out in this. A whiff of boiling pitch during road-mending operations in the Strand will bring up the caulker's pot on the Cornish coast, a waft of burning wood or weed in a suburban garden present to the mind's eye Scotch moors and peat reek. The day's work or evening's leisure must necessarily be unconsciously lightened and subdued by such mental pictures and remembrances.

Photography does the same quite as effectively and reliably. More so, for the Strand, by some strange chance, may not be up, or the tar and burning squitch be too strong for a mere suggestion, and regarded rather as a nuisance. Selecting the best pictures from a suggestive point of view, and thinking out the best way of doing the work will serve well as the agreeable change of work referred to. Without the thinking it is very possible to take a camera along with one, and find, looking at results, that it has been more of a hindrance and an encumbrance than a source of pleasure. The usual pictures of the parade, pier pavilion, beach, Saint Somebody's church, and the something drive, or head, and far better ones than he can take, can be got with no trouble and at little cost at any of the local fancy shops. But if the visitor have any individuality, and succeed in impressing it in a pleasing picture, it will be worth a great deal to him. The personal element, too, is a factor to be considered.

A picture of any child playing a holiday part in the beach world is very pleasing, but, when that child is one's own, its value is immeasurably heightened. Holiday pastime, scraps of sailing, fishing, and camping out have a breezy air about them at all times, but there is an added air of closer interest when the one at the tiller, making the cast, or seated at the tent door, is the *fidus Achates* with whom the holiday was spent. The chief reason for the lack of sustained interest in very many pictures is that the subjects were not chosen as ones particularly appealing to the taste of the one who took them. This should be an essential factor. A man visits a certain place noted for a particular object—church, bridge, castle, ruined abbey, glen, or waterfall—and, as tribute, conscious or unconscious, to the orthodox, feels it incumbent upon himself to have a shot at the well-known subject, whether he cares for it or not. It is a mistake. However important towards success a subscribing to the orthodox may be in the ordinary concerns and walks of life, during the holiday it should be thrown reasonably over. A man should then at least take his soul, as he does his body, out of its frock coat and stiff collar, and give one, as well as the other, a less trammeled chance of benefit in the freedom and lightness of flannel. Photographing the stately church front merely because it happens to be the most important feature of the town has little suggestion of a soul in flannel about it. Taking the boat repairing behind the wooden jetty, or the copper pan in which the harvest beer is boiling, has, provided they appeal strongly to personal liking. The resulting picture will be part and parcel of one, as it were, an expression of individuality, and not merely the leading subject of a guide-book, and the stock one of local professionals.

Here, as a matter of practice, comes the question as to what kind of camera to use, whether a stand or a hand one. Much could be, and has been said both, in favour of, and to the detriment of, both. The question rises, in reality, much higher than one of mechanical merit and demerit. It is a psychological one for the user. The camera ranks among the "fruits" by which a man may be known. He of the stand camera has qualities and traits wanting, or present in a much lesser degree in him of the hand camera, and *vice versa*. Take the extra publicity of object, for instance, given in carrying the former. One man may not object to it in the least—may like it, indeed; whereas another would as soon lead an ostrich by a chain through a town as carry and pitch tripod and camera in a public place. Both are estimable men, but they differ in degree of sensitiveness. The one can be seen and heard on public platforms explaining and asserting political and civil rights; the other is fonder of his garden and books. The extra weight of the stand camera would betoken firmer purpose in the attainment of a special object, the added care and work necessary in using it, a careful and deliberate man. He is likely to be one engaged in an occupation with much detail in it, due attention to which he has learnt the value of, generally in the school of experience. He is the kind of man we are not surprised to hear quoting a proverb.

The hand-camera user is more off-handed in his nature, is inclined rather to ignore detail, but keen at seeing and seizing a salient point. His artistic taste is as high as his fellows', possibly higher, but he gratifies it more satisfactorily by a scrappy suggestion than a full picture. One would expect him to be rather indifferent to politics and a Broad Churchman. With differences so deeply rooted, what is the use of recommending that which one likes to the other? Let each consult his own special constitution first, and then the dealer's catalogue. If there be no marked individuality and plenty of money, and they generally go together, both kinds of camera can be used. The majority, taking all into consideration, will probably elect for a hand camera folding into a small compass to take with them for a holiday. What desirable occupation and pleasure it can give, any intelligent man can realise for himself by thinking for a moment of the great number of charming little spots and incidents of life outside his ordinary groove he has missed in the past from not having such a one with him.

The broad suggestion for July work, then, is quiet, thoughtful selection of personally pleasing and suggestive holiday subjects taken with the easiest-working camera.

THE CHEMICAL NATURE OF RADIO-ACTIVE SUBSTANCES.

[Translated from the *Deutsche Photographen-Zeitung*.]

THE "photography of the invisible" has made considerable progress in recent years. It is well known that Becquerel discovered the radiating property of uranium. Not long afterwards G. C. Schmidt discovered that similar radiations were emitted by compounds of thorium. Lastly, M. and Mde. Curie obtained from pitchblende a radio-active substance which is photo-chemically four hundred times more active than uranium. It was surmised by the Curies that this very radio-active substance contained a new element strikingly similar to bismuth, and named it polonium.* Mde. Sklodowska Curie is a Pole by birth. Shortly after this discovery, the Curies, in conjunction with G. Beinont, found a second substance, of much greater radio-activity, in pitchblende, and again thought this was a new element, radium.† Lastly, Debierne also obtained from pitchblende a new substance likewise characterised by very considerable radio activity.‡

We thus know of radio-active substances obtained from five different sources, viz., compounds of uranium, thorium, polonium, radium, and Debierne's substance. Of these five, the chemical properties of the first two, uranium and thorium, have been known for years, and exactly defined. Both are elements, and consequently cannot be further decomposed chemically with the means at our disposal.

But it is quite different with the last three substances mentioned, which are merely hypothetical, and only accepted as supposititious elements. Polonium agrees completely with bismuth in all its chemical properties, and it is impossible to separate or isolate it.

Radium strikingly resembles barium, and cannot be separated from it any more than polonium from bismuth. It is therefore correctly described as radio-active barium.

Professor F. Giesel, of the Technical High School, Brunswick, has made important contributions to our knowledge concerning both these substances.§ Although he used a quite different method from the Curies, he has also obtained radio-active barium from pitchblende. From 1000 kilos of crude pitchblende he obtained 15 grammes of radioactive barium preparation. Giesel has also found polonium associated with lead.

The substance discovered by Debierne behaves, chemically, exactly the same as titan, and hitherto it has been impossible to separate it from the latter.

These three hypothetical elements are all obtained from the same material, and have the striking peculiarity of being mistakably like other well-known chemical elements, with which they are always found in association, and from which it is impossible to separate them. The only difference is their radio-activity. These facts forcibly suggest that the three hypothetical substances are not to be regarded as elements, which opinion is confirmed by the examination of the properties hitherto known of the three substances. However, such a discussion is of a purely theoretical chemical nature, and, as it would be of no interest to the readers of this periodical, we must leave it without examining the point more critically.

* *Comptes Rendus*, vol. cxxvii. p. 175.

† *Ibid.*, vol. cxxvii. p. 1215.

‡ *Ibid.*, vol. exxix. p. 197.

§ *Archiv für Wissenschaftliche Photographie*, vol. i. p. 297.

A definite answer to the question, whether the radio-active substances contain really new elements or not, can only be given after they have been subjected to experimental chemical examination. Two well-known ways are open, the analytical and the synthetical methods. The first reduces the substance under examination to its components, and the second forms the substance artificially from the chemical elements. Hitherto all the radio-active substances in which a new element is supposed to exist have been obtained from pitchblende by analytical methods. If a radio-active substance could be obtained artificially from one that is radio-inactive by use of the synthetical method, we should have incontrovertible experimental proof that the radio-active substances are not new chemical elements.

Considerations such as these induced Professor Béla v. Lengyel, of the II Chemical Laboratory of Buda-Pesth University, to attempt to prepare the radio-active substances synthetically. According to the treatise which he has just published, he has actually succeeded in converting ordinary barium to radio-active barium, or, in other words, he has prepared radium synthetically. He has, in fact, prepared three radio-active compounds—barium sulphate, and from it the chloride and carbonate. The radio-activity increased after the lapse of several days, and was proved with photographic dry plates (Schleusener's). The photographic action was shown not only with the substance by itself, but also after interposition of a copper coin between it and the plate, and the developed image increased in density with the thinness of the coin, and was most intense where the rays had fallen upon the plate unprotected by the coin. Moreover, the radiations of Lengyel's preparations illuminated the fluorescent platino-cyanide of barium screen, in the same manner as the radiations of radium. Lastly, the radiations from the artificial preparation rendered the air highly conductive of electricity, which is also the case with the radium rays.

These facts call in question the elementary nature of radium, but further work of the most discriminating kind is necessary before a final answer can be given, whether the radio-active substances are new elements or not. We have to thank Professor von Lengyel for the first contributions to the solution of this interesting question. These were experimental, and therefore beyond doubt. He is now occupied in preparing the necessary material for a decisive examination. For those who are interested in the subject we give the method of preparing the radioactive barium sulphate adopted by Von Lengyel. Uranyl nitrate is fused with two to three per cent. of barium nitrate, kept at a red heat to eliminate the nitric acid, and the oxides which are left are fused in an electric arc light. The fused mass is then dissolved in nitric acid, and by evaporation most of the barium nitrate is crystallised out. The hot solution is poured off the crystals, and, when clear, diluted with three to four times the quantity of distilled water. Sulphuric acid is then added. Radio-active barium sulphate is thus precipitated as a fine white precipitate. Wash well with hot distilled water, dry, and raise to red heat. The radio-active barium sulphate obtained in this way is a fine white powder, with a yellowish tinge, due, probably, to the presence of a trace of uranium. The yield is not very large. From twenty grammes of barium nitrate three to five grammes of radio-active barium sulphate are obtained, and this is, doubtless, contaminated with ordinary barium sulphate, which is not radio-active.

DR. F.

THE NEWCASTLE CONVENTION.

The following is a synopsis of next week's proceedings:
MONDAY, JULY 9.

Excursion in and around Newcastle.—Parties will be conducted from the Assembly Rooms to the old Castle, Black Gate Museum, Cathedral, Tyneside, &c., as may be desired.

Proceedings.—At the Grand Assembly Rooms, at 7.30 p.m., official opening of the Convention by the Mayor, after which the new President will deliver his Presidential Address; followed by an Exhibition of specially selected lantern slides and a collection of slides illustrative of places to be visited during the excursions.

TUESDAY, JULY 10.

Excursion to Hexham, the Roman Wall, &c.—Train leaves Central Station at 9.50 a.m.; luncheon at the Town Hall at 1.30 p.m.; brakes leave Town Hall at 2.30; trains from Hexham at 8.3 and 8.53; arriving at Newcastle at 8.58 and 9.35.

There will be no meeting at the Assembly Rooms on Tuesday evening.

WEDNESDAY, JULY 11.

Excursion to Jesmond Dene.—Reception by G. P. Bainbridge, Esq., J.P. (President of the Newcastle and Northern Counties Photo-

graphic Association), in the Banqueting Hall at 2 p.m.; the Official Convention Group will be taken at the Old Mill (top end of the Dene) at 3; refreshments in the Banqueting Hall at 4.30.

Proceedings.—At the Grand Assembly Rooms, at 10 a.m., the Annual General Meeting, election of Council for the ensuing year, &c.; meeting of the new Council at 11; Annual Dinner and Smoking Concert at 7 p.m.

THURSDAY, JULY 12.

Excursion to Durham.—Train leaves Central Station at 9.30 a.m.; arriving at Durham at 9.50; luncheon in the Banqueting Hall, Durham Castle, at 1.30 p.m.; train leaves Durham at 6.5; arriving at Newcastle at 6.50.

Proceedings.—At the Grand Assembly Rooms, at 8 p.m., a paper by Sir J. Benjamin Stone, M.P., on "National Photographic Records;" a paper by Mr. J. Bridges Lee, M.A., on "Photogrammetric Methods as applied to Record and Survey Work;" followed by an Exhibition of specially selected lantern slides.

FRIDAY, JULY 13.

Excursion to Alnwick, Hulne Abbey, &c.—Train leaves Central Station at 9.30 a.m.; arriving at Alnwick at 10.39; brakes will be awaiting the arrival of the train at Alnwick; luncheon at the White Swan Hotel at 1.30 p.m.; after luncheon visit Castle, churches, &c.; train leaves Alnwick at 4.10; arriving at Newcastle at 6.30.

Proceedings.—At the Grand Assembly Rooms, at 8 p.m., a paper by Dr. P. H. Emerson, M.A., entitled "Bubbles;" a paper by Mr. S. B. Webber on "Some Residues, and what to do with them;" a paper by Mr. E. Howard Farmer on "Desiccated Dry Plates;" followed by an Exhibition of specially selected lantern slides.

SATURDAY, JULY 14.

Various short excursions to places in and around Newcastle will be arranged as may be required. Members will oblige by signifying their wishes to the Hon. Secretaries as early as possible, in order that satisfactory arrangements may be made for the desired excursions, and particulars duly posted on the notice-boards.

THE HOME AND HAUNTS OF CHARLES DICKENS.

On Saturday, the 23rd ult., a whole day's excursion, which was arranged by the President (Mr. Hector Maclean, F.R.P.S.), was participated in by a number of the more prominent and expert members of the Club to Rochester.

Leaving East Croydon about 8.30, and proceeding via London Bridge, Rochester was reached soon after ten o'clock. The slopes of the railway cuttings for several miles from Strood were remarkable for the sheets and clumps of the brilliant-hued crimson flowers of the spurred valerian.

At Rochester, a three-horse brake, in which the party took their seats, galloped down the renowned High-street, over the bridge, and climbed one of the steep, long hills which encircle the Pickwickian town. Passing by the quaint house known as "Mock Beggar," a distant view of "Joe Gargary's" forge was obtained. Proceeding into the hundred of Hoo, our cicerone, the Rev. C. H. Fielding, reminds us that a cutting of the new railway, not long since made in this primitive corner of England, passed right through a huge whale, whose remains the line bisected almost at right angles. Just over twenty years ago, when curate of Higham, Mr. Fielding had to do duty at St. Mary's, Hoo, and, driving over by the high road, he was surprised to find that at one point it had been ploughed up for several hundred feet. If this is done to the main road, what must happen to byways? Cooling Church was next visited on account of its connexion with *Great Expectations* (remember the scene between "Pip" and the escaped convict). But what the photographers enjoyed most was the fine old fourteenth-century moated castle. This yielded a large number of exposures. All too soon the drive was resumed back to Rochester. Here, at the never-to-be-forgotten Bull Inn, the party lunched, in the very same coffee-room in which the members of the Pickwick Club enjoyed their convivialities. The assembly room, where "Jingle" and "Dr. Slammer" had high words, and other notable rooms, nooks, &c., were duly inspected. After luncheon, the party took open or skirmishing order, and individually visited and photographed Eastgate House (associated with "Rosebud"), the Seven Poor Travellers (Watts' Charity), the Castle, Cathedral, Guildhall, and other notable spots. At three sharp away we drove to the Sir John Falstaff, hard by, where Prince Henry relieved the knavish knight of his ill-gotten gains. Our chief objective was, of course, Gad's Hill House, where the great novelist lived his last years. We could easily dwell upon the manifold

beauties and their suggestions of this place of pilgrimage, describe the grand cedars and cypresses which face the house, the delightful rosary, the restful and graceful garden at the rear, the cricket field, which was the scene of so many free-and-easy cricket matches, the sham books with their humorous catch titles, the very spot where the greatest of English novelists passed away, the table by the study window where he wrote a great part of his last novel. But time forbids; besides, truth to tell, most of his novel-writing was in late years done at odd moments—anywhere but at home. Thus many still living hereabouts can remember how Charles Dickens was wont to walk over to Higham Station, sit down in the waiting-room, and scribble away at *Edwin Drood* almost by the hour, and then perhaps get into a train and continue to write on his journey.

Gad's Hill has too often been the scene of robbery and murder, as many a well-authenticated record shows. Thus a highwayman, who one morning killed his victim just here, galloped to Gravesend, crossed to Tilbury by the ferry, and rode into York within the day. Soon after arriving he spoke to the Mayor, of whom he asked the time. A few days afterwards, being arrested, he pleaded that no man could have done the crime at Gad's Hill in Kent, and within a day's span ridden to York. This fact is what suggested to Harrison Ainsworth Dick Turpin's fictional ride. Driving through the delightful Shorne Woods, just now ablaze with rhododendrons, Cobham Hall, that magnificent mansion belonging to Lord Darnley, was reached.

By the special influence of Mr. Fielding, the party were permitted to enter the noble State apartments, amongst those seen being the gilt hall, the picture gallery, the portrait gallery, the Queen's bedroom, &c. Passing through the delightful park, with its large herds of deer, and noticing the long dark avenue of lime trees, never used but for the funeral of the master of the house to take its mournful way, tea was enjoyed at "The Leather Bottle," which, as every one who knows his *Pickwick* will remember, was the inn to which Mr. Tupman fled when deserted by his Rachel, and hard by which the immortal discovery of the prehistoric stone was made, the first portion of the inscription on which ran as follows: " + BILST. VM., &c.

After tea, some time was spent around Cobham Church and the quaint almshouses, then through the cornfields and hop gardens to Sole-street, Croydon being finally reached at 9.45. It may be safely said that those who went for this memorable trip will have a lifelong pleasure in the reminiscences of the many scenes and suggestions stored up in their minds, to say nothing of the photographs. Those others who missed their chance must try and obtain consolation by forming a resolution to do better for themselves next time.

An unusually pleasant afternoon's outing has been arranged by the Hon. Secretary, Mr. W. H. Rogers, for Saturday, July 7, when a party of members and friends will drive over to the delightful but little known district of Chessington. The brake or brakes will start from the Club at two p.m. Those wishing to accompany the party should notify Mr. Rogers by Wednesday next.

GELATINO-CHLORIDE EMULSION.

I.

DESPITE the numerous published formulae for the manufacture of gelatino-chloride emulsion, the writer has not yet found a thoroughly exhaustive treatise upon the subject, i.e., one which explains the rationale of the process, and the why and wherefore of using the different ingredients; in fact, most formulae seem to agree with W. S. Gilbert in *H.M.S. Pinafore*, and "never mind the why and wherefore." This may answer all right for superficial experimenters, but for scientific workers, and more especially for commercial purposes, it is useless. These introductory remarks explain the perpetration of the following article.

A gelatino-chloride emulsion is made by forming chloride of silver in a very fine state of division in a solution of gelatine, the viscosity of the gelatine holding the fine particles of silver in suspension. It is not possible to form an emulsion without using a colloid, as, in the absence of the latter, only a precipitate is formed.

The usual ingredients in a gelatino-chloride emulsion are gelatine, nitrate of silver, an alkaline chloride, and one or more organic salts. Several formulae give, as the only ingredients, gelatine, silver nitrate, and an alkaline chloride. Certainly this will give an emulsion, but one that is useless if kept more than a few days.

In the published formulae for gelatino-chloride emulsion a great diversity of opinion seems to exist in regard to whether an emulsion should be washed or not. The advocates of the washed emulsion say (in several cases) that it is imperative, while the advocates of the unwashed ignore washing. The writer unhesitatingly declares for the unwashed, on the following grounds: first and foremost being that it is

totally unnecessary, therefore a waste of time and material, as the paper should be thoroughly washed before it is toned, and disregard of this washing is one of the chief reasons why so many people fail in working the commercial gelatino-chloride paper; secondly, the salts left in the film help to absorb the chlorine, consequently print quicker and avoid bleaching the image. The only advantage which the writer can see obtained by washing the emulsion is, that it is not so likely to absorb moisture when washed as it is when left unwashed, for nearly all nitrates are deliquescent; but, as it is not a difficult matter to keep the paper free from damp, this is not a great argument in favour of washing. The writer is of opinion that a much more vigorous image is obtained with an unwashed, than with a washed emulsion. If free silver is desired in the film of a washed emulsion, it must be added after the washing, as the uncombined nitrate of silver is washed away.

The question of free silver in the film is another point upon which difference of opinion prevails, some maintaining that an emulsion containing free silver will not keep any length of time, which is slightly erroneous, as the writer has kept paper containing free silver for nearly six months, with only very slight deterioration of colour, though, undoubtedly, the more free silver contained in the film, the more likely it is to discolour. Many maintain that free silver is necessary to absorb the chlorine, but the writer is hardly inclined to agree with this view, as he believes that the citrates and tartrates form the sensitising agents, for chlorine has a very much stronger affinity for silver than either citric or tartaric acids; but, after all, so long as an emulsion is obtained which prints, tones, and keeps well, besides being satisfactory in other ways, the free-silver controversy may be dismissed. Undoubtedly, most of the commercial papers contain little, if any, free silver.

Another debatable ground is on the quantity of nitrate of silver required in an emulsion. Among the published formulæ which the writer has tried, this diversity ranges from 7 grains per ounce of emulsion to 22½ grains per ounce. The first quantity the writer considers ridiculously inadequate, while the latter is exactly the reverse, and the writer considers that the most suitable quantity will be found to be midway between these two extremes, about 15 grains per ounce of emulsion being ample to get a good image, while in quantities this may be reduced, as the waste in large quantities is little, if any, more than the waste in small, and merely the amount necessary to give a good image is required. Recrystallised nitrate of silver should be used, as the ordinary kind is usually of too acid a nature to be good for emulsion work.

The question of filtering has been carried almost to absurdity in many formulæ, some writers saying that chamois leather, or several thicknesses of swansdown, are necessary to filter through. The writer cannot agree with this, as, if the emulsion is properly made, with practically no grain, filtering through an ordinary jelly-bag, or, better still, one of the filters obtainable commercially seamless is quite sufficient; while, if the emulsion is not properly made, a very high temperature is necessary to filter through such dense materials, and very frequently even then they clog, and the emulsion refuses to percolate. In filtering gelatino-chloride emulsion it is necessary to wash the filter in hot water and wring it out before commencing filtration, or great difficulty will be experienced.

One of the most necessary articles to study in gelatino-chloride emulsions is the gelatine, and, for the sake of English commerce and enterprise, the writer is sorry to say that he is unable to recommend a single English gelatine among the large quantity manufactured. Messrs. Nelson manufacture two which are eminently suitable in every way except one, but, unfortunately, that one is fatal, being a strongly pronounced yellowness, otherwise Nelson's D 1 and No. 2 Photographic are excellent, being hard, not too absorbent, giving a good glossy film, with perfect freedom from grease, which, as the writer explained in a previous article, entitled, "Gelatine for Emulsion Work," which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY on September 23, 1898, are, with absence of yellowness, absolutely essential in a satisfactory emulsion gelatine.

The reader may think that with the very thin film required upon gelatino-chloride paper the slight colour of the gelatine would not be noticed, but, to prove that such is not the case, a piece of the thin skin used by goldbeaters should be placed upon white paper, when, although the skin is very thin indeed, the colour is plainly discernible. The writer has only found two of the Continental gelatines quite satisfactory, some which in all other respects are admirable being spoilt by the large amount of grease which they contain, and therefore the only gelatines which the writer can confidently recommend, as suitable for gelatino-chloride emulsions, are the Winterthur Swiss gelatine, and a German gelatine manufactured by Fischer & Schmitt; both of these are excellent in all respects. The quality of the gelatine and the method by which it is manufactured largely affect the resulting emulsion, a point which seems to have escaped the notice of most writers upon this subject, for upon the gelatine to a large extent depends the colour which the film gives, which makes it all the more regrettable that English gelatines are not suitable, for Nelson's No. 2 Photographic gives a light red print, which is easy to tone, and does not reduce much in working. Winterthur gives a reddish-blue print, while that of Fischer & Schmitt gives a violet of great vigour and beauty, but rather more difficult to tone; fortunately this can be somewhat overcome by a variation in the different chlorides and salts. As water is the solvent of gelatine, the question of choosing

a chloride becomes an easy matter, as all the suitable chlorides are soluble in water, and consequently it is only a question of selecting the most convenient. The chlorides most generally used for emulsions are ammonium, calcium, lithium, strontium, and sodium, the colours of the images given by them being ammonium, violet, calcium, dark blue, lithium, medium red, strontium, and sodium, light red. Those most generally used for gelatino-chloride emulsions are ammonium and sodium, principally because they seem most suitable, are cheapest, easily obtainable, can be procured in a fairly pure state commercially, have a high combining power, and possibly because ammonium is obtained more pure than sodium as a rule, and has a slightly higher combining power than the latter, it is generally preferred—personally the writer favours sodium, as the light red tone which it gives is much more easy to manipulate afterwards, and sodium nitrate, which is one of the salts left in the film, is not so deliquescent as ammonium nitrate, thus the paper is not so likely to absorb moisture. Should there be any difficulty in procuring sodium chloride in a pure state, it may very easily be manufactured by adding carbonate of soda to hydrochloric acid until it is neutral to litmus paper, and, on evaporating the water, a hard cake of perfectly pure sodium chloride is left; this is a very good way, even if it is not difficult to obtain what is usually sold as pure sodium chloride, and which is often of a very hygroscopic nature, showing that it contains other salts (probably magnesium) besides sodium, the latter of which should not easily absorb moisture from the atmosphere.

The next items to consider are the organic salts, to preserve the paper so that it will keep its colour well for some length of time, besides helping to give greater vigour to the image. The salts which answer this purpose are citrates, tartrates, and oxalates, but it is found in practice that the two former are most suitable, and the most generally used of these are citric and tartaric acids, potassium and sodium citrates, Rochelle salts (potassium-sodium-tartrate), and cream of tartar. Salicylic acid is sometimes used as a preservative, but it must be carefully used in gelatino-chloride emulsions, as it is not very soluble in cold water, though more so in hot, one grain of the acid requiring about two ounces of cold water to dissolve it; therefore, if a greater quantity is used than a quantity of cold water equal to the emulsion would dissolve, the acid will crystallize out. Citrates are generally found to give darker images than tartrates; in practice the best results are obtained by combining the two. Citric acid and citrates seem to give the best keeping properties; tartaric acid and tartrates, brilliancy; and Rochelle salts, depth and vigour. The writer, therefore, combines all three.

The aim in a gelatino-chloride emulsion is to obtain one which does not reduce much in toning and fixing. This is secured by a printed image of a light red colour, which is very much easier to tone than one of a dark colour, gives a greater range of tone, with nothing like the reduction that a dark-coloured print gives, the latter of which apparently, but not really sooner reaches the requisite tone, and then largely disappears. This disadvantage may be obviated to a large extent by printing the image deeper; but, at best, this is a misleading way, and getting an emulsion which only reduces slightly, is very much better, and, for commercial purposes, is absolutely essential to success.

In making gelatino emulsions the temperature must be carefully studied. In some of the published formulae a temperature of from 140° to 180° F. is advised. The writer believes that he has tried all the hardest gelatines made, and he has not found one which is not fluid at 100° F., and, as Messrs. Nelson say in a little card of directions which they issue, gelatine should never be heated to a higher temperature than 120° F. This the writer cordially endorses, except for bromide emulsions, and it is a fact which should be especially borne in mind when making gelatino-chloride emulsions, as a high temperature discolors gelatine and destroys its setting power, both very bad things for printing-out emulsions. The writer advises melting the gelatine at a temperature of 100° F., and keeping at this point while mixing, raising it to not more than 120° F. just before filtering. Gelatine should not be kept too long in a dilute state, or decomposition may set in.

Many formulae give alum as one of the ingredients in a gelatino-chloride emulsion, and some points in its favour are that it has an antiseptic, hardening, and clarifying effect upon gelatine, and, as no gelatine has yet been produced which is quite colourless, the latter is an important advantage. Some of its advocates contend that it gives detail of the emulsion, this may be so, although the writer does not hold that view, and does not quite agree with using alum in an emulsion, but he gives a very good formula containing alum for those who care to use it.

This is the formula which the writer recommends:—

FORMULA I.

No. 1.

Silver nitrate recrystallised	150 grains.
Citric acid	40 "
Distilled water	1½ fluid ounces.

No. 2.

Tartaric acid	20 grains.
Sodium bicarbonate	10 "
Water	1½ fluid ounces.

No. 3.

Hard gelatine	480 to 500 grains.
Sodium chloride	20 "
Rochelle salts	20 "
Water	7½ fluid ounces.

Distilled water *must* be used to dissolve the silver, or probably the latter will be reduced, but ordinary tap water is good enough for No. 2 and No. 3.

The silver should be weighed out and dissolved in the water, then warm, and shortly before using, add the citric acid, and allow to dissolve also; it is advisable to form the citrate of silver before adding to the gelatine, so that as little free silver as possible may be added direct to the former. It is better to warm the silver solution before adding the citric acid; otherwise, when the silver citrate is formed, it is very liable to be precipitated, owing to the fact that silver citrate is not very soluble in cold water.

Place tartaric acid in the water, and, when quite dissolved, add sodium bicarbonate; effervescence will ensue, which must be allowed to subside. This will be found more reliable and economical than using commercial sodium tartrate. A discretionary margin has been allowed for the gelatine, as gelatines differ very much in their viscosity, and, where 480 grains are ample with one kind, 500 are necessary with another. The sodium chloride, Rochelle salts, and gelatine should be placed in the given quantity of cold water, and left until the gelatine is quite soft and swollen; place the jar in a water bath and gently raise the gelatine solution to not more than 100° F., when the hardest gelatine will be found liquid, and this is the temperature at which mixing should take place.

C. T. SUTTON.

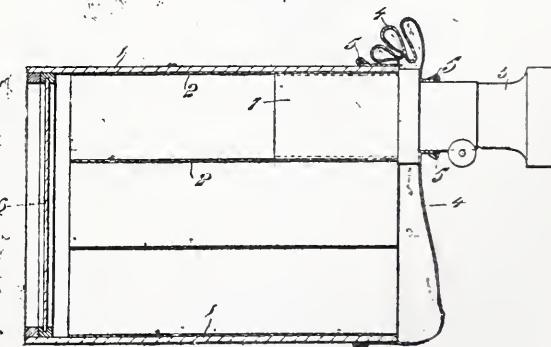
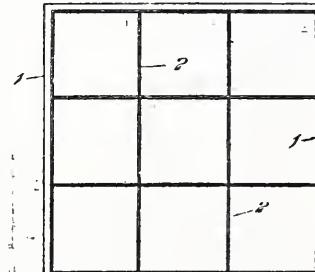
IMPROVEMENTS IN CAMERAS.

[Willis & Mence's Patent No. 12,623 of 1899.]

The invention relates more particularly to that class of camera by which the different parts of a sensitised plate may be exposed consecutively.

The patentees state that they are aware that cameras have been made to utilise one portion of a sensitised plate for one position of an object, and another portion for another position, or that one view has been produced on one portion of a plate and another view on another portion, and that, when the plate has been fully utilised, all the views contained thereon have been developed at one operation, and prints of all the views taken from the negative plate at one time.

According to the invention the apparatus is simplified, the operation



of taking the photograph rendered facile, and the possibility of taking the different views in rapid succession is assured.

They prefer to use an ordinary square-shaped camera, though other kinds may be adapted for their purpose, and they divide the interior vertically and horizontally or otherwise, so that longitudinal tubes are formed which extend from the front to the back of the camera or a part of such distance. The ordinary focussing-screen plate-holder and lens are employed, or films may be used, but they mount the lens on a short length of tubing which will fit freely into the tubes of the camera. The interior of this short length of tubing and of the longitudinal tubes are

coated with lampblack or other ordinary material. Around the end of the camera, and covering the front of the same, they fix a loose bag so that it is light-proof, and they make the same of any suitable textile material which is impervious to light. A hole is cut near the centre of this cloth, and the front of the lens passed through the same and so fastened as to be light-proof.

The tubes may be made telescopic and capable of sliding in other tubes in order to obtain a correct focal distance between the lens and the glass screen as required for different views or subjects.

In taking photographs the lens is applied to one of the tubes and an exposure effected by removing the cap or operating a shutter in the ordinary way. The cap or shutter is replaced and the lens applied to another of the tubes for a second exposure, the operation being thus repeated until the lens has been applied to all the tubes.

By removing the tubes the camera can be used as an ordinary camera, and a photograph taken which will cover the whole plate.

1 is a camera with its front removed and shown on the drawing square-shaped; 2 are the tubes, which may be made of tinplate, light wood, vulcanite or other suitable material coated with lampblack; 3 is the tube containing the lens; 4, the extensible covers made light-proof upon the camera and the tube, 2, by elastic rings, 5, or by other suitable means; 6 is the focussing screen.

The lens tube, 3, is mounted upon a short length of tubing, 7, which is made to fit the tubes, 2, and may be readily removed from one tube, 2, to another.

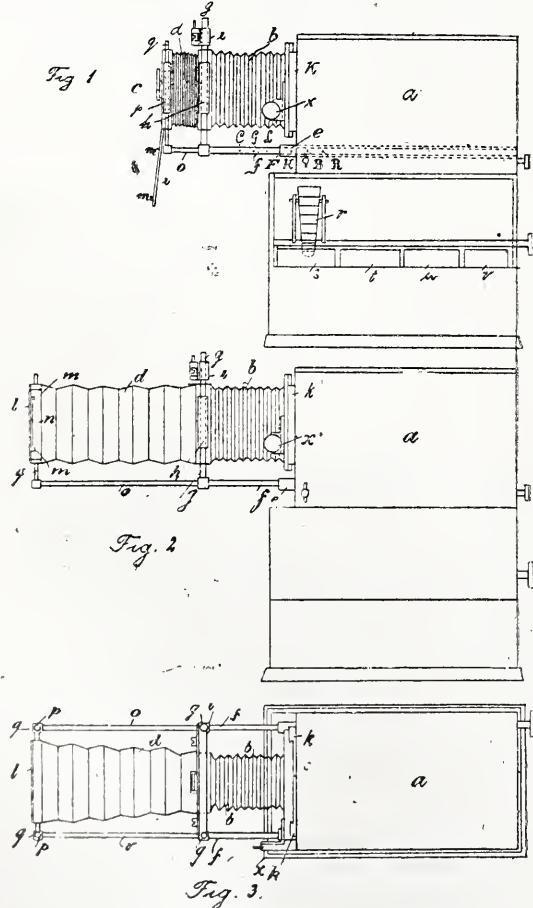
An exposure is effected with the tube, 7, in any of the tubes, 2; the said tube, 7, is then moved into another tube, 2, for a fresh exposure, and so on until the whole divided interior has been exposed. The cover, 4, excludes the light during the removal of the said tube, 7.

POSITIVES IN THE CAMERA.

[Foersterling's Patent No. 19,474 of 1899.]

An apparatus for photographing the negatives previously obtained in the same apparatus instead of converting the negatives into positives, as hitherto, by printing or chemical action, on black backgrounds. This apparatus may be vertically or horizontally arranged, and the operation effected automatically or by hand.

Figs. 1 and 2 are side views of the photographic apparatus. Fig. 3 is a plan. The bellows, b, with the objective, c, serves for taking the nega-



tive. The finished negative is placed from inside on the front, l, so that, when the bellows, d, is drawn out, it stands opposite to the objective, c, and, upon being "taken" again, furnishes the desired positive. The top of the bellows, d, is made of some material through which the light can penetrate, gauze for example.

The apparatus here represented is composed of a case, a, for receiving and changing the plates of the bellows, b, with the objective, c, and the bellows, d. In the chamber, a, are two parallel tubes, e, in which tubes, f, are telescopically adjustable. The tubes, f, support the vertical tubes, g, on which the objective frame can be raised or lowered and adjusted by means of sleeves, h. The back frame of the bellows, b, is adjustable in a prismatic guide, k.

This apparatus has no matt or focussing screen, but the focussing is effected in accordance with a graduated scale placed on the tube, f, and experimentally fixed according to the distance of the object. For determining the distance, a measuring band, x, arranged at the side of the apparatus, is employed. The chief points in the graduated scale, placed on the two tubes, are indicated in fig. 1 with c, copy; g, group; l, landscape; r, full figure; k, three-quarter figure; b, bust; r, bicyclist. The number of points may be as preferred.

By means of this apparatus the plates are exposed, the finished negative, n, placed between the guides, m, of the closing plate or shutter, l. The bellows, d, is adjustable by means of tubes, o, guided in the tubes, f. The tubes, o, also may be furnished with an experimentally determined graduated scale, for the purpose of adjusting the bellows, d. By means of the sleeves, h and i, the bellows, d, can be adjusted higher or lower on the tubes, q and g. For the purpose of developing the positive taken from the negative is brought into the carrier, r, and the carrier successively immersed in the developing baths, s, t, u, v.

PHOTO-MECHANICAL PRINTING SURFACES.

[Vogel's Patent No. 8038 of 1900.]

An impression on a translucent medium, such as paper, gelatine, celluloid, or the like, is first made from a printing block (woodcut, line etching, autotype, or the like).

The positive thus obtained is copied by means of light upon a plate of copper, brass, zinc, or other suitable metal, or on to stone, and developed in the same way as is usually employed for relief or cameo etchings, and in this process the same substances, sensitive to light, such as asphalt, chrome albumen, chrome gum, chrome gelatine, or chrome glue, or even mixtures of these separate substances, are employed.

A negative copy is thus obtained, that is to say, the metal or stone is blank at those places which correspond with the black parts of the positive, whilst it is covered at the places which correspond with the transparent parts of the positive, owing to the layer of asphalt, chrome albumen, chrome gum, chrome gelatine, chrome glue, or the like, rendered insoluble at these places by the action of the light, and therefore permanently retained when developed.

Instead of copying the positive directly on metal or stone, it may be copied on photo-lithographic transfer or pigment paper, and then the copy transferred in the usual way to metal or stone, and subsequently developed.

If the metal plate or stone be placed in an etching substance, that is to say, a solution which dissolves the metal employed, such as an acid, perchloride of iron, or the like, this solution can only attack the metal or stone at the uncovered places, as at the other places the etching liquid is kept off by the coating which covers the metal or stone.

A relief is thus obtained in which, as opposed to an ordinary printing block, the parts corresponding to the dark parts of the positive are countersunk or in intaglio, whilst the parts corresponding to the white portions of the positive are raised or in relief.

The relief is deeper the longer the etching substance is allowed to act on the plate. From the deeply impressed plate thus obtained impressions or prints may then be taken, which are applicable for use in a printing press. For instance, as in the case of the Woodbury prints, impressions may be taken therefrom, melted gelatine being poured over the plate, and then a sheet of paper or other flexible medium laid over it, and the whole placed in a press. After the gelatine has set, the sheet of paper may be drawn off the plate and dried. Celluloid papier maché, indiarubber, gutta-percha, or other suitable material, may be employed in place of gelatine for forming the relief, whilst the penetration of the material into the etched (intaglio) parts of the printing plate may be assisted, if necessary, by the application of heat.

Studio Gossip.

RESTORING DAGUERREOTYPES.—Mr. J. Adams, of New Marston, Oxford, writes: "If your correspondent, F. W. Tassell, will let me know the condition of the Daguerreotype, I will tell him if any good can be done. I am one of the very few old Daguerreotypists left, dating back to 1848, and was an exhibitor at the Exhibition of 1851."

PATENTS IN JAPAN.—A number of new Acts have been passed in Japan to amend the Law of Patents, Designs, and Trade Marks. Under these Acts the duration of a patent is fixed at fifteen years, and of a copyright of a design ten years, subject to the payment of annual fees. The term of protection obtained by registration of a trade mark is fixed at twenty years, except in the case of trade marks previously registered abroad, where the term is the same as that for which the original registration is valid.

ECLIPSE PHOTOGRAPHY WITH AN ORDINARY LENS.—Mr. E. Williams, of Wkhurst, sends us a print from a negative which he made of the eclipse, following our suggestion of using the half of a lens to obtain a long focus. It was made with the half of a 16-inch Dallmeyer rectilinear with a specially made stop about $\frac{1}{8}$ -inch aperture, thus giving about $f\cdot 250$. The exposure was about $\frac{1}{8}$ of a second, on a backed "Bee" plate, time four p.m. The result is excellent.

THE THREE-COLOUR PROCESS.—The art critic of the *Daily Chronicle* notes Mr. Hentschel still perseveres in his "three-colour" experiments. It is suggested that he should try to reproduce a Japanese colour print, with flat tones and simple scheme. He has followed the advice, and just omitted the result. It is certainly more satisfactory than the reproduction of the same process of elaborate paintings; but, except where the colour is red, as with the positive blues and greens and reds, it has a tendency to reddishness. Surely the brown in the road and the house roofs was very different in the original print. However, it is distinctly one of the best things Mr. Hentschel has done, and a new process that can already accomplish much may reasonably be expected to accomplish more in the future, though the chances are, always within rather narrow limits.

THE LIGHT TREATMENT AT A LONDON HOSPITAL.—A department has been opened at the London Hospital for the treatment of lupus and some other diseases of the skin by Professor Sinsen's method of phototherapy, or "light treatment." This work is being carried on in connexion with the department of diseases of the skin, and is superintended by the physicians in charge and the immediate care of the special dermatological clinical assistant. The introduction of this method of treatment at the London Hospital, the first in Great Britain to adopt it, is due to the Princess of Wales, who has taken great interest in it since she saw it carried out in Copenhagen. Her Royal Highness presented the necessary and expensive apparatus required, being anxious that its benefits should be extended to the poor of London. The treatment consists in the application of the chemical rays of light either by sunlight or by electric light by means of carefully arranged appliances. The arrangement has now been in operation for several weeks. Four patients only have been treated free of expense in the mornings, but it is intended to devote the afternoons to the treatment of those who can afford to pay. Nurses have been specially trained for the work at Copenhagen.

News and Notes.

MR. E. CECIL HERTSLET, F.R.P.S., Her Majesty's Consul General at Havre, has been appointed by the Royal Commission for the Paris Exhibition to be a member of the International Jury in Class 12, Photography, in the place of Sir William Abney, K.C.B. resigned.

THE NEWCASTLE CONVENTION.—Messrs. Marion's representative, Mr. T. E. Fletcher, will be in Newcastle during Convention week, and will have an extensive show of their latest introductions, &c., at the Central Exchange Hotel (the nearest hotel to the Grand Assembly Rooms).

THE Picture Post Card is the name of a new monthly publication which makes its appearance on July 2. As its sub-title explains, it is "a magazine of travel, philately, and art," and is intended primarily for those interested in holiday travel, illustrated post cards, and stamp, coin, crest, and curio collecting, but will at the same time give prominence to cognate subjects.

NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.—At a Council meeting held at 66, Russell-square, 225 prints were received, including 100 from Sir J. Benjamin Stone of Windsor Castle, from Messrs. Malby, Harold and Oliver, Diveri, Mr. and Mrs. Snowden Ward, Mr. E. Scamell, the Hon. Secretary, &c., and a series of reproductions from the Editor of the *Londoner*, and it was announced that 253 prints had been forwarded to the British Museum.

THE South London Photographic Society's Fourth Continental Excursion to the Rhine Valley and Ahrgau will take place from August 18 to 27. The leader is Mr. William F. Slater, F.R.P.S. The estimated total cost is £1. 5s., which includes fares on railways, second class between London and Cologne, third class on daily excursions, and saloon on all boats, hotel accommodation, meals per programme, and all gratuities. The headquarters are at the Hotel Bonn, Remagen. A detailed programme has been issued. Those wishing to join this excursion must remit to William F. Slater, 5, Finsbury High-road, Lee, S.E., not later than Saturday, July 28, the sum of £10s. towards travelling expenses. Any further information can be obtained from Mr. Slater.

THE Redhill and District Camera Club's excursion on Saturday, July 14, to Chilworth Pools, St. Martha's (the Pilgrim's Church), Newland's Corner, the Silent Pool. The following itinerary has been issued to members:—Starting: Redhill Station at 1.50 p.m. Book to Gomshall (return); train at 2.15 p.m. (Reigate 2.5). Conductor, Mr. Ralph W. Robinson. Route: Drive, or walk to Chilworth Pools, thence to St. Martha's. Walk by path (one hour) or drive round by road to Newland's Corner. At 6 p.m. drive to the Silent Pool for tea (6d.). At 7.30 drive to Gomshall for return train at 8 p.m., Redhill 8.40. Charge for conveyances, 1s. 9d. each. Scenery: The route is through the most beautiful scenery in Surrey, and the view from Newland's Corner is, perhaps, the finest in S.E. England.

THE ANDRÉE EXPEDITION ONCE MORE.—When, one is inclined to wonder, will we receive the last reports and rumours about this ill-fated expedition? Standard of Thursday, last week, contains a telegram from its Berlin correspondent, saying that a Copenhagen paper has received a telegram from him, containing only the two words, in Finnish, "Andrée rescued," adding significantly that no confirmation of the report has been received. In an evening paper of the same day we read that a bottle has been found on the

Irish coast containing a post card, stating that it had been thrown into the sea by the Swedish Polar expedition in 1898 to test the ocean currents. The card is said to be addressed to Captain Ernest Andrée in Sweden, and the finder was requested to post it on to him. One may well ask what next?

THE PARIS EXPOSITION.—The University of Paris has an exhibit in the Palace of Letters, Science, and Art, containing a number of reproductions of photographs of the moon and of the heavens, covering a wall space of eighteen metres long by four high. The large photographs of the moon are presented to the public for the first time. They have been taken by Messrs. Loewy and Puiseaux with the large telescope of the observatory; the photographs are shown in small size in order to appreciate the fineness of detail obtained by the instrument, then a series of bromide enlargements is shown by which they are more clearly seen. One of the photographs is that obtained by taking two plates of the moon at ten and at twenty days after new moon; these have been enlarged sixty times the surface, and placed side by side, the result being an image of the whole hemisphere of the moon with a direction of light which brings out the relief and shows the details of the craters and mountainous regions.

AT the Frome Police Court, on June 27, John Stuart, alias Watts, Banks, and Lane, was charged with having, on March 25 last, at Kilmersdon, obtained by means of false pretences £9. from Louisa Cox, and various other sums from a number of people. The evidence was to the effect that prisoner represented himself as an agent for the London Stereoscopic Company, on whose behalf he requested to be allowed to take photographs of farmhouses, the pictures being required for magic-lantern slides, railway carriages, and panoramic views. The prisoner told the various farmers that he would forward them pictures according to the payment made, but he failed to do so. The camera used by the prisoner was an empty box, on an ordinary stand. There was no lens, and it was quite impossible for the prisoner to take photographs. Edward Simpson, Secretary to the London Stereoscopic Company, said the prisoner had not been in the employ of the Company, but during the last four or five years they had received complaints from all parts of the country of similar frauds being perpetrated in their name. Further evidence was given to show the prisoner had a receipt book in his possession, in which receipts had been entered for 4*l*. 3*s*. 3*d*. The prisoner was formerly in the 12th Foot, and was in receipt of a pension. He was committed for trial at the Quarter Sessions.

Commercial Intelligence.

WE are informed that the Directors of J. H. Dallmeyer, Limited, have declared and paid an interim dividend on the Company's Deferred Stock, for the six months ending June 30, at the rate of twelve per cent. per annum.

CHANGE OF ADDRESS.—Mr. Wilfred Emery, of 15, Anson-parade, Cricklewood, N.W., writes: "I have fitted up a dark room for amateurs at the above address, and as it is on the much-frequented main road to Edgware, near the Crown, Cricklewood, it should prove useful to many cyclist photographers. I can also supply them with plates, films, &c. I shall be glad if you will mention, as many customers are still unfamiliar with the change of address."

THE Thornton-Pickard Manufacturing Company, of Altringham, send us a copy of the new edition of their German catalogue, which has just been published. The Company add: "Should any of your readers desire to possess a copy either for themselves or their friends who may reside in Germany or in other countries where the German language is spoken, we shall be happy to send one or more on application. You will be pleased to hear, we are sure, that our shutters continue to have a largely increasing sale in Germany, our sales for last year showing a very satisfactory increase over the previous year. The German photographic public, like the English, appreciate a reliable article." We congratulate the Company on the continued success of their celebrated shutters.

TRADE SECRETS.—According to a contemporary, a trade secret decision has recently been handed down in one of the German courts, which possesses considerable interest. The foreman of a factory invented a substance which was used by his employer in finishing rustling velvet. The foreman imparted the composition of this substance to other makers, and was sued by his employer, and in the lower court was found guilty. The defence was that the foreman had only parted with his own invention, which was his intellectual property. The case was appealed, and was dismissed on the ground that the foreman was employed by the firm, and his invention was only a part of the service which he owed to his employer, and only an *employé* would be trusted with experiments which would lead to such an invention. On account of the facilities which his position offered, he was enabled to make an invention which an outsider would not have made, and that he made it in consequence of his employment, for which he was duly paid. The Court held that, when he imparted his secret to strangers, he violated the German law for "the suppression of base competition."

"FORMALIN."—In the Chancery Division, on Tuesday, June 26, Mr. Justice Farwell had before him an application by the Formalin Hygienic Company, Limited, to register the word "Formalin" as a trade mark. The matter came before the Court on an appeal from the Comptroller, who had already refused the application. The applicant's case was that a forty per cent. solution of formic aldehyde, manufactured by the Chemische Fabrik auf Aktien vormals E. Schering, of Berlin, was first placed on the English market by Messrs. A. and M. Zimmermann as sole agents for Messrs. Schering, in 1882, under the name "Formalin," which name was registered in Germany as a trade mark. It was then sold for the purposes of disinfection and general antiseptics. The applicant company was formed in 1897, and acquired all the rights of sole agency from Messrs. Schering for the sale of their manufacture of "Formalin." The applicants applied the word "Formalin" to various other articles besides the forty per cent. solution, such as "Dry Formalin," or Paraform; "Normal

Formalin," a weak solution for domestic use; "Formalin Powder," "Formalin Gelatine," and "Formalin Soap." There was also a lamp, in which parafraum is burnt for disinfecting purposes, called the "Formalin Lamp." Drs. Rideal and Passmore and Mr. Bevan deposed that the word "Formalin" *per se* conveyed no meaning to the chemist upon his hearing it for the first time. Mr. Hughes, Q.C., and Mr. Ward Colridge appeared in support of the application; the Attorney-General (Sir Robert Finlay, Q.C., M.P.) and Mr. Ingle Joyce appeared for the Comptroller. Mr. Justice Farwell, in dismissing the application, held that it was a fatal objection to it that it was not made by the proprietors of the article in question. He was convinced on the evidence that the word "Formalin" had never in England represented to the trade at large or to the public any manufacture of any particular individual. He held that there had not, as a fact, ever been acquired in England any such association of the name "Formalin" with the manufacture of the German company or of Schering as would entitle either of them to say that it connected their manufacture and nothing else. The application failed, and would be dismissed with costs.

Patent News.

THE following applications for Patents were made between June 18 and June 23, 1900:—

COLOUR PHOTOGRAPHY.—No. 11,213. "Improved Apparatus for Viewing the Superimposed Images of Multiple Diapositives with Colour Screens." Complete specification. A. SAUVE.

CAMERAS.—No. 11,277. "Improvements in Photographic Cameras." H. ERNEMANN.

PLATES.—No. 11,290. "An Improvement in Photographic Plates." F. C. SHARDLOW.

SHUTTERS.—No. 11,320. "Improvements in or relating to Photographic Shutters." J. HARRINGTON.

FINDER.—No. 11,333. "An Improved Photographic Finder." J. C. CARSON and A. J. JONES.

OPTICAL ILLUSIONS.—No. 11,393. "Optical Illusion Apparatus." J. LOCKIE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
9.....	Southampton	Print Competition: <i>Animal Studies</i> .
10.....	Birmingham Photo. Society	{ Presentation of Prizes Awarded at the Annual Exhibition
10.....	Hackney	{ Demonstration: <i>Venus Paper</i> .
13.....	Birmingham Photo. Society	{ Complimentary Dinner to Mr. Harold Baker.
14.....	Bootle	{ Excursion: Altcar. Leader, R. C. Bond.
14.....	Borough Polytechnic	{ Excursion: Southfleet. Leader, W. Page.
14.....	Brentford	{ Excursion: The Chalfonts and the Jordans. Leader, F. Turner.
14.....	Croydon Camera Club	{ Excursion: Aldershot.
14.....	Redhill and District	{ Excursion: Chilworth Pools, St. Martha's (the Pilgrim's Church), Newland's Corner, and the Silent Pool. Leader, Ralph W. Robinson.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 26.—Technical Meeting,—Major-General J. W. Waterhouse, I.S.C. (Vice-President), in the chair.

A BIG ENLARGEMENT.

Mr. EAST, of Kingston, sent for exhibition a bromide enlargement, 40 inches by 70 inches, from a negative about 1 inch by $1\frac{1}{2}$ inches. The original—a portrait of a lion—was taken with a Zeiss-Satz Anastigmat of 9 inches focus and an aperture of $f\cdot12\cdot5$, and the enlargement was of an exceedingly satisfactory character.

NEW LENSES AND A NEW ALLOY.

Mr. J. H. AGAR BAUGH showed a new lens by Messrs. Voigtlander, with a focal length of 3 inches and working at $f\cdot2\cdot3$, and said that a similar lens, working at $f\cdot1\cdot8$, had been made exclusively for astro-photography, for which purpose it had been used with much success at the Yerkes Observatory and other places. He also showed a lens mounted in magnalium, an alloy of pure magnesium and pure aluminium, and possessing some remarkable properties. Magnalium is silver-white in appearance, without the greyness of aluminium. Its specific gravity is 2.2, and it is therefore lighter than aluminium, the specific gravity of which is 2.7. It will not oxidise in air, but is affected by alkalies. As regards its use, it is very much harder than aluminium, can be filed as easily as brass, and screws can be cut in it as fine as 100 threads to the inch for instruments of precision. It is not yet on the market, but will not be expensive, and Messrs. Voigtlander propose to supply lenses of certain sizes mounted in magnalium at the same price as for those with brass mounts.

A CHAT ABOUT LENSES.

Mr. J. H. AGAR BAUGH had been announced to read a paper on "The Selection of Lenses with regard to Photographic Perspective," but the address which he delivered dealt with many points in connexion with lenses. He began by expressing the opinion that the Society's standard method of measuring or numbering stop apertures was rather out of date, and suggested the advisability of adopting the method in general use by Continental opticians namely,

to ascertain the efficient aperture by focussing the sun on the ground glass, then substituting for the latter a piece of ferotype plate with a pinhole, putting a light behind the pinhole, and measuring the circle of light on the front lens. He showed four lenses of the same focus, working at apertures respectively of $f\cdot2\cdot3$, $f\cdot5\cdot4$, $f\cdot7\cdot7$, and $f\cdot11\cdot3$, and said he preferred the last-mentioned because he appeared to get sharper images with it than when stopping down the others to the same extent. He thought this was due to the thinness of the lens, there being no room for the light to go backwards and forwards, and to the fact that when using it there was less stray light in the camera. He thought that for prints on paper no photograph should be taken with a lens of less than 10 inches focus; if, in the case of quarter or half-plate pictures, a lens of shorter focus must be used, the image could only be correctly seen by viewing it through the lens with which the negative was taken, or by enlarging it at least two diameters. When the rising front of the camera was brought into operation, the picture could not be correctly seen unless it were held at a suitable angle, and he suggested that the hanging committees of photographic exhibitions should take care that pictures taken with a rising front should be hung in such a manner as to produce the proper idea of perspective. He strongly objected to photographs taken with wide-angle lenses. If one was standing near a church tower, one could only see the whole of it by shifting the position of the eyes, and he therefore suggested that such subjects should be photographed in sections, at different angles, and the prints joined together, and even then they must be enlarged if the proper effect was to be produced.

Mr. W. E. DEBENHAM said the title of the paper was misleading, and that it tended to perpetuate the fallacy that the selection of lenses had anything to do with perspective. Whatever lens was employed the perspective was identical, for it was solely dependent upon the station point and the plane of the picture.

Mr. H. W. BENNETT, referring to the use of wide-angle lenses, thought the ultimate result of the picture should be considered rather than any arbitrary rule as to the angle included. There was a general objection to the use of wide-angle lenses unless they were absolutely necessary, but it frequently happened that the only way to make a thoroughly satisfactory composition was by including a rather wide angle.

The Rev. F. C. LAMBERT said there was a good deal of truth in the contention that, for a picture to be seen at its best, it must be hung or held in a definite position in relation to the eye. He instanced the case of a photograph taken down a well, which represented nothing at all when hanging on a wall, and could only be understood when placed upon the floor and looked down upon.

The conversation was continued by the President, and Messrs. Bolas, Hodges, Brown, and others, and Mr. Baugh replied.

LENS CONJUGATES.

The Rev. F. C. LAMBERT read a note upon "How to Ascertain the Conjugates of a Lens without Calculation," and showed how the information referred to might be found with no more apparatus than a sheet of cartridge paper, a paper measure, a broomstick, and a few pins.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 28.—Annual Meeting,—Mr. A. Haddon in the chair.

Mr. A. L. HENDERSON brought up and passed round a number of lantern slides from photographs taken in Paris during his recent stay there. He promised early in the autumn to give a show of his Bordighera and Paris slides.

Mr. T. E. FRESHWATER showed some old large-size stereoscopic prints of Niagara, made in 1875, also of a Daguerreotype of a gardener amongst his plants, in an excellent state of preservation and tinted in the colours of nature.

The HON. SECRETARY read the following report upon the past year's work, and presented the balance-sheet, duly audited:—

Although not, perhaps, so eventful a year as some previous ones, I think the Association is to be congratulated upon a steady year of progress and a satisfactory record.

To turn first to some of the dry but usual items of an annual report, it is with pleasure that I am able to say our membership has increased during the year. We have elected more members than we have lost, so that we are in on this deal. We have, however, lost this year a member whose death was equally a loss to the photographic world at large. I refer to Mr. W. K. Burton, of Japan, who has long been an honorary member of our Association, and a respected one.

As regards attendances, we have also kept up to the standard. The average for the year, with its fifty meetings, is certainly satisfactory. Even during the dead season as some call it, or holiday months as others term it, June, July, and August, the average was good.

We have had some very good evenings indeed, but for a characteristic definition I should call 1899-1900 the year of the younger member. To commence with, three of our valued workers, Messrs. Heskins, Hodges, and Wright, as Lanternist, Recorder, and Librarian respectively, have been most assiduous, and, if the Librarian has not been worked to death by would-be borrowers of the solid volumes of fact and fancy that we possess, that is not his fault. Then, again, we have been favoured with about six papers from them, and, moreover, the end of the table to the left of the Chairman has not been nearly so silent during the year.

Our Open Nights, an institution that is essentially a feature of the London and Provincial Photographic Association, have been on the whole a great success, and we can readily forget the one or two failures. With very little trouble members can make an open night of the greatest interest. It only requires a few objects brought for inspection, or a judicious and well-timed question that will tread upon some one's favourite corn, either as to toning, developing, lens construction, &c.

We have not used the blackboard much this year. We have missed the A being equal to B, with C a bad third and D did not bid. But I do not think we have missed aught else.

I do not think our Lantern Nights have been up to the mark, and now that the summer months are here, or coming, I hope members will make a few hundred slides each, ready for the autumn evenings. During the year we have added a new lens to the lantern, and the front has been altered and novated. It took a good while to settle about that lens, but we have got it now, and a few hundred slides more or less will not "strain" it. Amongst the lantern nights, I may mention the following:—"Lowestoft and Neighbourhood," Mr. H. Vivian Hyde; Gloucester Convention Slides; "Photomicrographs," Mr. T. E. Freshwater.

During the year we had a few more trade demonstrations than usual, and some, I think, were successful evenings. We had the following:—"Kachin;" the Kromaz System of Colour Photography; The "Tella" Camera; Vicol; Wellington Film; Sandell Films; "Gravura" Paper.

Amongst other papers, we have had the following:—"Wholesale and Rapid development," Messrs. Human, Walford, and Crawford; "An Easy Method of Stripping Films," Mr. F. Kellow; "Elementary Composition and Perspective," Mr. W. R. Stretton; "Photogravure," Mr. E. Hunt; "The Art Developer," Mr. E. Human; "A Few Notes on Photographic Optics," Mr. J. W. Hodges; "The Amateur from Behind the Dealer's Counter," Mr. T. Wright; "Photographic Notes of a Naturalist," Mr. T. E. Freshwater; "The Projection of Colour," Mr. T. E. Freshwater.

If any one subject can be set down as prominent in this year's discussions, think we can safely apportion that honour to development questions, a sound or two of theory and a few tons of the practical.

The annual supper took place on February 15, when forty members and friends spent an enjoyable social evening, with Mr. Thomas Bedding presiding, Mr. H. Vivian Hyde in charge of the musical arrangements.

Turning now to the financial position of the Association, that is also very satisfactory. We have a larger balance in hand than last year. Our reserve has gone down slightly owing to the cost of new lantern lens and alterations to the front being defrayed from it. But with the cash in hand and at the bank we have a total of 30*l*. 4*s*. 4*d*. to our credit.

I think we owe a good deal to the photographic papers for various kindnesses, and especially to THE BRITISH JOURNAL OF PHOTOGRAPHY for their excellent reports of our meetings.

Finally, on my own behalf I have to thank many members for the kind support and sympathy so necessary to the welfare of this Association, and so helpful to your Honorary Secretary.

A motion for the acceptance of the report and balance-sheet was carried unanimously.

The election of officers, &c., then took place. The result was announced as follows, Messrs. Featherstone and Wright acting as scrutineers of the ballot:—
Trustees: Messrs. A. Haddon and J. B. B. Wellington.—Committee: Messrs. A. Beckett, R. P. Drage, T. E. Freshwater, J. E. Hodd, J. W. Hodges, A. Mackie, H. C. Rapson, J. S. Teape.—Curator and Lanternist: Mr. Heskins.—Recorder: Mr. Featherstone.—Librarian: Mr. E. T. Wright.—Hon. Secretary and Treasurer: Mr. Walter D. Welford.

Votes of thanks to the retiring officers and committeemen, the auditors, scrutineers, and the press were carried, with the usual speeches and replies.

Mr. R. P. Drage, after the formal business, commenting on a film negative shown by Mr. Human as what could be done on an old film, said that a celluloid film, in his opinion, gradually gave up its light impression from the moment after exposure. In other words, its retentive power was inferior to that of a plate, although in other respects it may be all right.

PHOTOGRAPHIC CLUB.

JUNE 27.—Mr. Hans Müller in the chair.

Mr. WASHINGTON TEASDALE, of Leeds, showed several eclipse photographs taken in India. He also passed round an original contact print of negative of the sun, half of which was hidden by a church steeple. The effect was very strange, the complete circle and a kind of halo being visible. A half-tone reproduction in the *Photogram* was also shown, and the two compared, the reproduction being very good. Other half-tone reproductions on paper and card were shown, as also some small collotype reproductions of very good character. A general discussion ensued, and some interesting points were brought forward.

HACKNEY PHOTOGRAPHIC SOCIETY.—At the meeting on the 26th ult., Dr. BURTON gave a most interesting lecture on

SKIAGRAPHY,

and showed the great value of the X rays in surgery and the diagnosis of disease. As a discovery for the alleviation of pain, he considered it next in importance to the introduction of anaesthetics and antiseptics.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—JUNE 25.—Mr. J. MacIntosh in the chair. In the unavoidable absence of the lecturer for the evening, a general discussion on technical matters took place. Several questions were asked as to details in carbon printing. One relating to getting prints on to rough paper by the double transfer process resulted in a suggestion by the chairman to try thin waxed paper as a temporary support, from which no difficulty need be anticipated during the development, and its flexibility would enable perfect contact to be secured with the rough paper support. Mr. H. W. Bennett had previously secured good results by sizing the rough paper with a fairly thick coating of gelatine and chrome alum, which swelled up in warm water and gave perfect contact.

FORTHCOMING EXHIBITIONS.

1900.

JULY 9-14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

July 12	Beverley. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.
August 21.....	Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
Sept. 21-Nov. 3	Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
October 1-Nov. 3 ...	Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
November 12-17	Ashton-under-Lyne. 21-23 Hackney Photographic Society. 1901.
January 14-19	Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS AND PAINTING REGISTERED:—

T. N. Langton, 539, Attercliffe-road, Sheffield.—Two photographs of Miss Lillian. Catherine Edmonds, 118, Westbourne-grove, W.—Photograph of Mrs. Flora Annie Steel.

Miss A. M. M. Swiney, Hartington House, Herne Bay.—Oil painting entitled, "The Sacred Heart."

The Worthing Portrait Company, 4, Railway-approach, Worthing.—Photograph entitled, "For Queen and Country." Photograph entitled, "When will you come back, daddy?"

GRASSINGTON (Bacup).—A very good negative, though the light is somewhat flat.

THE RHONDDA ART CO.—Send us the address of the firm, and we may be able to help you. We cannot do so without.

J. K. S.—The photographs are good, clever, and interesting. You should be able to dispose of the copyrights for Christmas almanac purposes.

SIGMA.—1. The formula is for plates fogged or light-struck before exposure. 2. We do not give such recommendations. Better examine the instruments yourself and make your own choice. You must not expect too much for that amount.

FAULTY LENS.—R. J. C. If the R.R. lens you have purchased, supposing its focus is ten and a half inches, will not yield a sharp image on a quarter-plate with its full opening, it must be a very bad one indeed. We cannot say how you can improve it without knowing more about it.

HOWARD BARRETT.—1. For the kind of negative it appears to be, we do not think you could do better than use a surface paper. 2. We do not think the print good enough for any but the most elementary competition. Our publishers have written you in regard to the registration.

DOYEN'S CAMERA.—R. MATHEWS writes: "Will you kindly inform me where Doyen's camera to focus by double reflection may be bought in London? I saw the notice of it in the ALMANAC for 1889, on p. 854."—In reply: To the best of our knowledge, the camera referred to is not on the English market.

ADDRESS WANTED.—W. S. MALKIN writes: "Would you kindly supply me with the address of M. Denayrouze, inventor of the new incandescent lamp without gas? I got the name from the *English Mechanic* of January 12, 1900, as taken from your JOURNAL."—In reply: Some Parisian reader might be able to supply the address asked for.

MACHINERY FOR MANUFACTURING P.O.P.—P.O.P. writes: "Would you kindly oblige me with the name and address of agents or manufacturers from whom I may obtain the requisite plant for the manufacture of printing-out paper?"—Flimsch & Co., Offenbach-on-Main, Germany, are manufacturers of emulsion-coating machines. We do not think they have an agent in this country.

BLOOD ALBUMEN.—S. WRIGHT asks: "Where can I get half a pound or so of blood albumen, and what is its price?"—We do not know where it is to be obtained in small quantities. It is usually dealt with in large bulks. It may possibly, however, be obtained at some of the drysalters' and those who supply dyers' materials. Messrs. Skilbeck, Upper Thames-street, we believe, supply it, but we do not know if they sell it in retail quantities.

PROCESS BLOCKS.—COUNTRYMAN says: “The church magazine of our village has ordered from me six process blocks from my negatives of the exterior and interior of the church for the Christmas number. How can I make them, or would it pay me better to get them made? The blocks will be about 5×4 ?”—Better get them made by one or other of the many process block-makers, as you do not know anything of the process, and have not proper appliances.

PAINTING A STUDIO.—J. C. writes for advice as to the painting (outside) of a photographic studio. He adds: “I find the usual way of puttying and painting lasts only a little while, and then lets the rain in.”—Nothing is better than the ordinary puttying and painting, if the work be properly done; but, unless the sash bars are perfectly rigid, under a strong wind nothing will make the roof water-tight for any length of time. Perhaps that is the cause of the trouble in your case.

THE HOFFMAN SYSTEM OF TRICHROMATIC PHOTOGRAPHY.—F. H. writes: “In your issue of June 22 you give a short account of Hoffman's trichromatic photography, and say that the apparatus is being placed on the market. Can you tell me where this can be obtained in England, or, if not, the address abroad?”—In reply: The apparatus is not obtainable in England, and probably will not be introduced here. We suggest that you address the author, care of his publisher, whose address is given in the first paragraph.

FLASHLIGHT FORMULA WANTED.—M. PAUL writes: “Could you give me the formula of a good and safe flashlight powder, such as are so extensively used on the Continent for studio work? Aluminium, I believe, enters largely in their composition.”—We know of no formula for a *really* safe flashlight. They are all more or less dangerous at times, and those times, unfortunately, are when danger is least suspected. We should recommend you to use one or other of the flash lamps, with either magnesium or aluminium powder by itself.

ADDRESS WANTED; COST OF A PATENT.—J. SPEIGHT asks for (1) the address of a manufacturer of glass funnels for chemical purposes; (2) the cost of a patent.—1. All photographic-apparatus warehouses supply glass funnels, so do all who supply chemical apparatus. We cannot give the names of manufacturers. Most of the glass funnels, we believe, are made abroad. 2. Four pounds for four years, if you take the patent out yourself. If you employ a patent agent to do the work, his fees will, of course, be in addition to that sum.

FORMULE WANTED.—A. H. TYLER writes: “1. From whom can I obtain a paper suitable for coating with emulsion (gelatine)? 2. Can you give me, or refer to, a formula to make a slow developing-out paper?”—1. From Messrs. Otto König & Co., 27, Cross-street, Finsbury, E.C. 2. The makers of the developing-out papers do not publish their formulae; they treat them rather as secrets. We expect you will have to work one out for yourself. Formulae for bromide emulsions will be found on pp. 976-976 of the ALMANAC. These may help you somewhat.

CLEANING AN ENGRAVING.—THANKFUL says: “I shall be very thankful if you can tell me how I can clean an engraving. The most objectionable marks are, like water markings, a little yellow. The margin is the principal part to be cleaned.”—If the dirt is slight, it may possibly be cleaned off with the crumb of a loaf; if not, the print must be “cleaned,” *i.e.*, bleached by the action of chlorine. If you have had no experience in this kind of work, we should advise you to put the print into the hands of a print-restorer, that is, if it is of any value. An engraving may be easily ruined in the hands of a novice.

ASSIGNMENT OF COPYRIGHT.—J. W. OAKLEY writes: “On November 12 last you registered a photograph of Eastleigh Town Hall for me. I think I shall want to assign the copyright. I shall esteem it a favour if you would kindly answer the following questions: If I assign, must I get a form from Somerset House, or will a stamped agreement form answer the purpose? If I must get a form from Somerset House, will you kindly tell me what I must send for it?”—No special form is necessary, but the assignment must be in writing, and signed by the owner of the copyright or his agent. See page 630 of the ALMANAC.

PUBLIC PHOTOGRAPHY.—J. G. W. writes: “My brother was walking with a lady on a public promenade (the Hove Lawns) on a recent Sunday, and his portrait, with that of the lady, was included in a cinematograph series of pictures being taken by a local photographer. As the two people did not notice the camera, they walked almost up to it, and appear very prominently. The pictures are exhibited at a local music-hall, and appear to be a source of annoyance to the parties concerned. Can the exhibition of these photographs be legally restrained?”—In reply: No. In our opinion no English Court would sustain you in your objection.

LENS QUERIES, &c.—BADDEN POWELL writes: “1. I have two uncorrected lenses, 6 inches focus. What is the right distance the stops should be in front of the lenses? They are $1\frac{1}{2}$ diameter; also whether should the flat or curved side look to the view? They are for stereoscopic views. 2. What is the right distance the dry plate should be nearer the lens than the focussing screen. Will they take as good views as corrected lenses? 3. How is it that some views look as well in the stereoscope, although you put the right-hand view to the left side? 4. What is the right number of grains of magnesium powder and the number of grains of chlorate of potash to expose an Imperial special rapid plate, f-18, seven feet from sitter?”—1. The flat side should be next the views. Fix the stops about one-and-an-eighth of an inch from the lenses. 2. About the thirtieth of its focus. 3. We should recommend you to read the article in the ALMANAC on the stereoscope. That will enlighten you on stereoscopic photography generally. 4. We cannot say, as we have not made any experiments in that direction. We should, however, advise you to be very careful in dealing with the mixture, for fear of an accident.

COPYRIGHT QUERIES.—PAINTER writes: “I should be much obliged if you would kindly inform me—1. How one can tell if a photograph is a copyright? Are all such marked plainly that they are so? 2. Has a painter the right to copy any celebrity from a photograph when there is no sign that the photograph is a copyright or not? 3. What is the good gained by copyright?”—In reply: 1. By searching the register at Stationers' Hall. A photograph marked “copyright” is not necessarily registered. 2. No; he runs the risk of being sued for infringement of copyright. 3. The good? Judge for yourself. The Act of 1862 was passed for the purpose of enabling the author of a photograph to protect his own interest in it.

FOGGED NEGATIVE.—WALTER MACFARLANE writes: “I have a negative of a three-quarter figure beautifully exposed, lighted, &c., all in white against a dark ground, but one end of negative, fortunately away from figure, is slightly fogged. It was the first of a box, and used immediately, so I think I am free from fault myself; but, as the fog does not obliterate the detail of the picture, can I in any way reduce that part to equal density with the rest? I have an idea I read of using alcohol absolute for reducing halation, &c., which would answer the same purpose in my case, in your paper some while back.”—We doubt if the treatment proposed will remove the fog, or that any other will effectually, but it may be tried. We should say that the best thing would be to vignette the picture in printing, and have it as a vigneted portrait.

STAINED NEGATIVES; COPYING A DRAWING.—MONMOUTHSHIRE writes: “Some time ago I took six splendid negatives of groups, and in my hurry I mixed up developer with washing soda and pyro, instead of sulphite of soda and pyro, and developed all six negatives before I noticed what I had done. Now all my negatives are a bright red. I have tried alum, and it will not touch the stains. Will you kindly tell me how to remove the stains? It takes a fortnight to get off a print. 2. I have a drawing (pencil) to photograph. Will you kindly tell me how to keep the lines black and paper white? I have copied two negatives, and they come out all one colour.”—1. The only thing we can suggest is that you try one of the clearing solutions given on pp. 969-967 of the ALMANAC. 2. Use a slow plate that gives great density, such as those supplied for photo-mechanical work. Do not over-expose, and develop so as to get good density.

VALUE OF AN OLD ENGRAVING; STUDIO BLINDS.—S. PORTER writes: “1. A friend of mine has shown me a picture which he has not long since picked up at a sale. It is either an old steel engraving or an old print, and he thinks there is value in it. I enclose you a little description of what he thinks is of the original painting, which he has given me. I have also made a copy of it for you to see. Will you be good enough to give me your opinion on it? 2. I have recently had my studio painted out. The light is north-east, with sun only on the top light. What colour blinds are most suitable? I am thinking of having light green for the top, which run on rollers, and a medium blue for the sides. Can you say what the material would be called in asking for it at a shop? Would any white blinds be required as well?”—1. We can give no idea of the value of the engraving, though we should say it is not much. Better submit the engraving to a picture dealer. 2. The proposed blinds will do very well. Window holland is, we think, the name of the material. White blinds will not be necessary with that aspect.

USING A TENT FOR PHOTOGRAPHY, &c.—J. C. LANE writes: “Will you please tell me if I can utilise this tent (photograph enclosed) for photographic purposes? Stands on top of hill, with large expanse of country in front of it, fifty miles or more. Sun on it all day. Light could be let in at top by oiling where a piece has been tried. White calico could be put thereon with sloping tops. Front side might be screwed on. No other place for it. The ground is a little uneven, but tripod leg slipped, when slide came out, and made it worse. Is there any better method of taking doubles than shifting piece of wood at back of camera, taking half at a time? Taylor's duplicator does not answer for use of a shutter, and this is all-important to have both sides with equal exposure.”—We should say that the tent could be used if the open side were fitted with, say, blue curtains at the open sides, and the camera placed within the tent. By this means it would practically be converted into a studio. The arrangement mentioned is the simplest in the market. Of course, the two pictures must be taken separately, and there is no difficulty in giving equal exposures to each.

STUDIO REPAIRING.—A. T. writes: “Noticing in your issue of June 22 a reply to correspondent *re* studio repairs, does a repairing lease mean repairs of whatever nature must be done by tenant? The terms of my lease are that the landlord binds himself to keep premises wind and water-tight, but all internal repairs to be done by tenant. Strange to say, the day before I noticed your answer to correspondent *re* same, I had sent word to my landlord to see to glass roof of studio, as it was leaking through some panes of glass being broken, also leakage from back through loose slates. Landlord sends slater, but also sends word that I must see to the glass myself. Now, it distinctly says in my case (it is a lady), ‘Mrs. — or Law also binds and obliges herself and her aforesaid to keep the said house wind and water-tight during the whole currency of this lease.’ What steps can I take in the event of her not making roof good? I have been her tenant for five years, and she has always done repairs in glass roof before. The only way that I can account for her taking up this attitude (which I scarcely think is by her sanction) is, that I learn she is in bad health and not able to attend to business, so that it is through some other party that this repair has been sent me. However, I have nothing to do with that.”—Yours does not appear to be a repairing lease, so far as the outside of the building is concerned. But how far the landlord is responsible for *broken* glass we cannot say. We doubt if it is his place to repair a broken window, and the roof of the studio is simply a window.

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EX CATHEDRA.

By one of our weekly batch of patent specifications we perceive that an old fallacy with regard to obtaining stereoscopic effects from monocular photographs has been revived. The Rev. A. C. Pearson, M.A., has devised means for viewing photographs and pictures "whereby any single photograph or picture is seen through one lens or prism in similar relief to that attained by the use of the double photographs and two lenses in a stereoscope. He constructs a boxlike frame of such a shape as to fit close to the face, and so form a dark chamber, shielding the eyes, and provided with suitable lenses. He also provides a means whereby one or other of them may be shut off at will, so that the picture is visible to one eye only, and stands out in bold relief. The means employed for shutting off the lens may consist of a simple flap formed from sheet metal or other material, pivoted or hinged so as to have a swinging movement, permitting it to cover either the right or left-hand lens, as may be desired." The invention, in fact, simply consists of an American form of stereoscope with a

movable flap to obscure either of the oculars at pleasure. But looking at a single photograph through a stereoscope does not, and cannot, give true binocular effect. In nature the eyes see two distinct images, and two distinct, separate photographs must be presented to them when it is sought to represent nature in miniature relief by the aid of stereography. The employment of one eye, as suggested in the invention, for looking at single photographs is an idea at least as old as Sir David Brewster, whose theory was that the elimination of reflected light gave monocular relief—a very different thing to the stereoscopic effects claimed by Mr. Pearson.

* * *

ELECTRIC head-light photography forms the subject of an interesting illustrated article in a recent number of the *Scientific American*. The writer points out that in many portions of the Southern and Western States the railroad tracks are not separated from the adjoining fields and grazing lands by fences, and it is a common practice for the farmers to allow their live stock to run at large. As a result, the railroad companies are compelled to pay large sums annually for cattle and hogs which have been killed by passenger and freight trains, and a number of serious accidents have occurred, due to derailment. The Central of Georgia Railway traverses a very large area of low-level country, and until the adoption of the electric head light the engineers were obliged to use the greatest caution in running at night, and on some occasions it has been necessary to stop the trains and send men ahead to drive live stock from the track. Engineers were under orders to run trains slowly through the grazing districts, as on a dark night they could see but a few hundred feet of the track ahead, the oil head light being of very limited range.

* * *

By using the electric head light the length of vision had been greatly increased, remarks the writer, objects being plainly perceptible at a distance as over half a mile under favourable conditions of the atmosphere. In the reproduced photographs, such small objects as bridge warnings, posts, &c., along the right of way were distinctly visible at a distance of several hundred yards, so intense is the illumination, while a

broken rail or a displaced switch would be visible in time to mitigate, if not entirely avert, disaster. The photographs reproduced were taken by the light of the electric head light along the line of the Peoria, Decatur, and Evansville Railway. The negatives were exposed for about forty minutes. The light furnished is of the arc type, requiring carbon burners. The electricity is generated by an ordinary dynamo, operated by a Pyle compound steam turbine of $1\frac{1}{2}$ -horse power. The light with a good reflector equals about 8000 candle power. The dynamo and turbine are attached to the top of the boiler between the head light and the smokestack. Steam is introduced into the turbine from the main boiler at the will of the engineer, the mechanism, of course, being operated from the cab. A carbon can be used continuously for about eight hours, so that it is unnecessary to feed the lamp for that length of time. In connexion with the burner, an ordinary locomotive reflector is used.

* * *

IT is only those operators whose experience has brought them face to face with numerous subjects where street traffic has to be encountered, when undertaking some special commission, who can really understand the difficulties that have to be faced and overcome in work of this description. A typical case is that of some public structure situated right in the heart of a busy thoroughfare, and which is as often as not surrounded by high buildings that necessitate the camera being placed in close proximity to the edifice being photographed. In subjects of this kind even the services of an adjacent window are frequently without avail, and there is no alternative but to work from the street level at the furthest possible point. Churches and edifices containing spires or towers are by no means uncommon either, and these especially are very difficult to cope with; in fact, in most large cities there are usually several of the public buildings so situated as to make it impossible to get the entire structure included on a plate satisfactorily.

* * *

THE chief difficulty in dealing with subjects of this class lies in the necessity of shutter exposures having to be resorted to on account of the moving objects in the foreground, in conjunction with a strained condition of every other possible means, such as taking full advantage of the rising front of the camera, as well as tilting it to a considerable extent; and, when these alternatives have to be resorted to, it is extremely difficult to cause any lens to work deep enough in focus, at such close quarters as will yield even a fair degree of sharpness and definition, when employed with an aperture sufficiently great to yield a fully exposed negative by means of a shutter exposure. Apart from the strain imposed upon the lens in such cases, there is likewise the added difficulty of having to cope with the curiosity of the bystanders, for these never fail to cause an operator much annoyance when working in an open thoroughfare.

* * *

IN providing for work of this description it is best to employ a large plate and use the best covering lens obtainable for a plate of smaller dimensions. Thus a lens of what may be termed a mid angle type of about nine inches focus will cover a fairly wide field with an aperture of about $f-11.3$ and with a rapid plate and the best conditions of lighting quick exposures are possible. Circumstances, no doubt, will

arise where, under more favourable conditions of lighting and absence of traffic, a very rapid plate may be used in conjunction with a wide-angle lens working at an aperture of about $f-16$; but, in confined situations, it will be found that the former stop will be required if anything like good definition is to be obtained. In very busy thoroughfares, such as are met with in large towns, it at times becomes impossible to work from the street level, and then the only alternative is to employ some kind of vehicle wherein the camera can be placed. A class of vehicle specially suitable for work of this description is that employed by such firms as librarians, &c., in which the entrance is from the rear, the van being entirely closed in, and having doors back and front both of which are cut in half. These enable the camera to be placed on a flat box or pedestal in the rear of the van, and permit all the operations being performed in peace and comfort, quite apart from the gaze or knowledge of passers-by. Such vans can be drawn up at any point and never attract the attention that working from the top of a lorry or other open cart always does.

* * *

IT is well known that in nearly all cities and large towns there are buildings which it is almost impossible to photograph satisfactorily, and in some instances years have elapsed before it has been possible to deal with them by means of the camera, and then only by reason of some alterations to other structures being in progress in close proximity. It is at junctures such as these that much may be done by carefully watching for an opportunity to take many views which otherwise could never be secured, for not only can advantage be taken of space so opened up, but it will frequently happen that many desirable views of streets can be obtained from the platforms and behind the hoardings which surround the erections of new buildings. Several of the more important thoroughfares in large towns have only been secured by these means, and professionals especially should be alive to their interests whenever they see any alterations going on, for they seldom fail to offer special opportunities for obtaining photographs which otherwise would not be possible of attainment. This class of work is very far removed from snap-shot or hand-camera exposures, such as are possible at times from the top of cars, &c., which is merely child's play compared with the working of a 15×12 or 12×10 camera. It is when manipulating these large sizes that an operator begins to feel the anxiety of working under adverse conditions. A good roomy van is then the best means of securing the work being done well and with comfort.

MICRO-PHOTOGRAPHS.

TWENTY or thirty years ago the term micro-photograph was used by many eminent scientific men to describe photographs taken on a large scale from microscopically small objects. That meaning appears to have entirely lapsed, and such photographs are termed photo-micrographs, and the process of executing them photo-micrography, one of the most cacophonous words in the language; but, as it seems generally accepted as correct, we are bound to put up with it. The photographs we are now dealing with are microscopically small ones, taken from a much larger object. Originally they were merely a superior kind of scientific toy. A large number of microscope-owners some forty years ago thought their collection was not complete unless they had the Lord's Prayer, the Creed, &c.,

included in a space not as large as a pinhole, and requiring a microscope to see them. Daucer, of Manchester, made them largely, and at one time they were marvellously popular, so much so that the same optician sold a special camera for their production. Nowadays one hardly ever sees a micro-photograph in any one's collection.

A special interest attaches to these tiny photographs by reason of the recent death of the most famous maker of them in the world, M. Dagron. Long before some of our present readers were born M. Dagron was manufacturing these toy photographs, but a time came when his skill was made use of in a special way, and the manufacturer of toys became a public benefactor. This was at the siege of Paris by the Germans about thirty years ago. The death a few days ago, at the ripe age of eighty-one, of this once famous man, brings to mind the work he did in utilising photography and popularising its results in a way never equalled before or after. A brief description of what he did, and how he did it, will be interesting to every one whose memory does not carry him back to the time we name.

Early in the siege of Paris, communication with the outside world was difficult, and before long the investment was so close that it was virtually impossible to get a letter to Paris. Then it was that Dagron came to the rescue by establishing the most marvellous post that ever was. When he brought his plan before the Government, they were wise enough and free enough from red tape to at once recognise its value and adopt it, by furnishing him with means to leave the city with his apparatus. Two balloons—named, with singular fitness, Daguerre and Nièpce—were provided, and eventually, after a most adventurous voyage and the capture of one balloon by the enemy, Dagron, with his apparatus, established himself in Tours, and forthwith started making his toy photographs, but toys no longer, for each one was a budget of news, a bundle of letters from the outside world to the sorely beleaguered Parisians, and was carried thither by pigeons. He carried out his guarantee to the Government that he would deliver every day two hundred miniature photographs, each one consisting of a thousand words. The messages were first made as brief as possible, after the fashion of writing a telegram, then printed on thin paper, which was used as a negative to get copies on glass, which were cut in pieces, and then reproduced as "micro-photographs" on collodion, duplicated many times over by means of a camera with twenty microscope object-glasses as lenses. This duplication was done so that a number of similar dispatches might be sent, so as to ensure at least one reaching Paris. These collodion transparencies were stripped from the plate, rolled up in a small quill, and attached to pigeons' tails, the bird, upon being set free, setting off for the capital. Probably a million messages in the aggregate were dispatched, and of these fifty thousand reached their destination. When the birds arrived and were caught, the messages were removed from their tails, and the photographs re-enlarged to legible dimensions, cut into pieces, and given into the hands of a hundred clerks to copy out and dispatch to the indicated destinations.

For this kind of work a "structureless" collodion is necessary, that is to say, one which would give a film that may be magnified many times without showing grain or apparent structure. A pyro film, made at a rather high temperature with acids of maximum dilution, will be found best for the purpose.

Most people are familiar with the little ornamental stationery requisites of immense variety of shape, but each containing a small view, mounted upon one end of a little Stanhope lens, and inserted in these various articles. If they are taken to pieces, it will be found that the photograph is attached to the plane end of a Stanhope lens, and is protected by a glass coating, the photographic film lying between the two. The way of producing these pictures is by taking them with the multiple-lens camera upon a glass plate. These minute pictures are then cut up into little squares, attached to the lens by Canada balsam, and then the whole mass of glass and lens is put in a lathe and turned almost truly circularly cylindrical. These little cylinders are then ready for placing into the special place provided for them. Without the modern conveniences of gelatino-bromide films on celluloid sheets, and without bromide paper, Dagron yet contrived to get through his work with marvellous dispatch, a message being usually ready for the pigeon post within five hours after its receipt. But it may be safely said that his record would be easy nowadays to beat with such up-to-date facilities to hand. But all honour is due to him for the originality and dispatch with which he carried out his micro-photographic post.

South Kensington Teaching.—To adopt an archaic speech, we might say *Delenda est* South Kensington teaching, for the Secondary Education Bill recently introduced into the House of Lords foreshadows such a change in the educational plans of the Government that the various science and art classes that have done so much in the past in educating many hundreds and thousands of students will, at any rate in name, exist no longer. The Duke of Devonshire said, 'We propose to abolish the name Science and Art Department: the Science and Art Department will be merged in the Secondary Education branch of the office.' The main portion of the staff is to be transferred to Whitehall. The most interesting point to the readers of this JOURNAL will be the retention of the well-known name of Sir William Abney, who will occupy the important position of Principal Assistant Secretary for secondary education.

Kew Observatory is another institution which, in the march of progress, is to be known as such no longer. Beginning on the first day of the present year, it was incorporated into the National Physical Laboratory, and for the future the well-known Kew certificate, whether for lenses, thermometers, or other scientific instruments, will bear the impress of the new institution. It appears from the last reports of the Kew Observatory Committee—that for 1899—the instruments sent for verification were less numerous by over ten per cent., the number sent being over 22,000, the previous year's work having included nearly 2400 more than that number. It is somewhat remarkable that there are so few photographic lenses met with possessing Kew certificates, a fact which may, perhaps, be accounted for by the utterly unscientific way in which lenses and their performances have been described both in photographic publications and in the advertisements of the makers. When we read in the lists of makers of repute that such-and-such lenses possess good "depth of focus," it is futile to expect any one to take an interest in an exact description of the powers and limitations of such remarkable optical achievements as modern photographic lenses. To any one who can believe that depth of definition or focus is a function or some special property of a particular make of lens, such data would be as much use as a treatise on quantities to a Hottentot native.

The Great Telescope of the Paris Exposition.—The newspapers have made this instrument their own, and published paragraphs about it calculated to interest that overdone entity, the man in the street, but, in most cases, utterly devoid of a semblance of truth. Every one remembers how the instrument, before it was

built—for that is the only expression to be used regarding such a monster production—was to bring the moon to within half a mile of the observer. One of the latest pieces of information is that it will throw an image of the planet Mars on to the screen, and of a magnitude of ten feet in diameter. Now, a very simple calculation, familiar to photographers, can easily be made. The object-glass of the telescope is fifty inches in diameter. Supposing the glass to absorb no light whatever, it is evident that the light received from Mars by the glass will be spread out to cover an area about eight times as large as that glass, and, consequently, with only one-eighth of the brightness that a sheet of paper would possess if illuminated by the light of Mars alone. In other words, it would be invisible. It is within the bounds of possibility that, if a sensitive photographic surface were exposed to such an image for a few months, an impression might be obtained; but even this is something very different from the statement made. One more reference will suffice to show the utter absurdity of the statement. The moon's image is to be forty-eight feet in diameter, with the same telescope and screen, that is, about five times that of Mars; but it does not need pointing out that one to five is by no means the proportion that exists between the diameter of the two luminaries.

Steinpapier.—In Eder's *Jahrbuch* Herr Fritz, the Vice-Director of the State Printing Works at Vienna, writes in glowing terms of a new lithographic paper which has been introduced under the above name. It is a fairly stout card coated on one side with a matt white film, which does not soften nor dissolve in cold water. It can be obtained glossy, matt, or more or less strongly grained, or with lines impressed on it. It takes any printing or fatty ink, and gives absolutely sharp, clean lines, and it is possible to obtain from it any number of transfers, without harm to the matrix itself, of type, blocks, woodcuts, engravings, lithographs, or collotypes, on to stone, zinc, or aluminium. It promises to be extremely valuable, particularly in lithography, and a great saver of stones, as an impression may be made on or from it, the run finished, the litho-stone cleaned and reground, and the steinpapier proof kept, and, if the design is wanted again, it can be transferred to stone, and results quite as good as ever obtained.

Devils.—Professor A. Albert points out, in Eder's *Jahrbuch*, that some kinds of gelatine are extremely prone to give spots of a peculiar nature, which are due to minute bubbles of gas which, whilst the solution of gelatine is fluid, will rise to the surface and there break; but, as the gelatine sets, it cannot fill up the little pit thus made, and one has small pits with thickened edges. Albert says that by many this is said to be due to fatty substances which adhere to the surface of the gelatine, but that he has tried cutting off the edges of gelatine, cleaning both sides by various means, repeated meltings and coolings, and repeated skimming of the jelly, and from two to four filtrations through paper to obviate this defect, and without success. The cause lies in the gelatine itself, and it is interesting to note that the ordinary cooking gelatinas are specially prone to this. It is quite possible that the "devils" so well known in photogravure are due to this trouble.

A New Negative Varnish.—Valenta suggests the use of the following as an extremely useful negative varnish, which can be used either hot or cold, and which will take retouching easily without any medium:—

Manila copal	20 grammes.
Epichlorhydrine	70 "
Digest in a water bath till dissolved then add	
Absolute alcohol	100 c.c.
This may be further diluted with a mixture of	
Epichlorhydrine	1 part.
Absolute alcohol	5 "
It makes a very hard, clear, colourless film, which quickly dries.	

Panchromatic Plates.—Dr. Eberhard, of Potsdam, states, in Eder's *Jahrbuch*, that ordinary plates, especially chloro-bromide

plates, can be made practically sensitive to the whole of the spectrum by bathing in the following solution and quickly drying:—

Erythrosine (1 : 500)	2-3 c.c.
Silver nitrate (1 : 10)	some drops.
Ammonia	0.5 c.c.
Chinoline red (1 : 500)	1.5 "
Cyanine (1 : 500)	0.3-0.5 c.c.
Alcohol	50 c.c.
Distilled water	50 "

The plates are made much more sensitive, but they will only keep for one or two days.

The following also give similar results, but the plates are not so sensitive, but keep better:—

I.	
Acridine yellow (sat. alc. sol.)	6 c.c.
Cyanine (1 : 500)	2 "
Tetra-bromo-eosine (1 : 500)	2 "
Alcohol	50 "
Distilled water	50 "

II.	
Acridine yellow (sat. alc. sol.)	5-6 c.c.
Chinoline red (1 : 500)	1 "
Cyanine (1 : 500)	0.5-1 c.c.
Alcohol	50 "
Distilled water	50 "

Substratum for Plates.—Dr. E. Vogel suggests that for collodio-bromide emulsion, when stripping negatives are required for collotype or other photo-mechanical process, one of the best strata is a 0.1 per cent. solution of pure indiarubber in benzine. When, however, the film is not to be stripped, either of the following may be used:—

Gelatine	1 gramme.
Water	300 c.c.
Chrome alum (two per cent. solution) ..	6 "

The plate should be well washed, and whilst still wet flowed two or three times with this solution, or the plate may be coated with a solution of

Gelatine	3 grammes,
Water	1000 c.c.,

to which, when dissolved, should be added with constant stirring

Formalin	10 c.c.
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PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

[Presidential Address to the Fifteenth Annual Meeting, held at Newcastle-on-Tyne, July 9-14, 1900.]

WHAT NEWCASTLE HAS DONE FOR PHOTOGRAPHY.

The great city in which this gathering of photographers from all parts of the United Kingdom has met has borne an important share in the furtherance and development of photography, and I have therefore thought it right that the opening passages of this address should recognise the indebtedness. True to its reputation for practicability of ideas, Newcastle-on-Tyne's contributions to photographic knowledge have concerned themselves less with matters of speculation and theory than with those things which are of direct daily benefit to us. In this respect one name above all others stands out clearly and sharply. I allude, of course, to that of the distinguished master of electrical science, Mr. Joseph Wilson Swan. Nearly forty years ago the plan of printing in pigmented gelatine, termed the carbon process, was brought to practical perfection by Mr. Swan, who devised the transfer method, which is the working process of to-day.

Undoubtedly, carbon printing, though perhaps not the system in the greatest use, has attracted the least adverse criticism of any photographic process. The beauty of its images satisfies all tastes, and it escapes those accusations of impermanence which are occasionally levelled at other systems of printing. Consider, then, how appropriate it is that the name of Newcastle-on-Tyne should be associated with a charming printing process in which the image is formed of a chemical relation of the staple product of this part of Great Britain—carbon, of course, being only purified coal. Rest assured of this, that when the New Zealander, spoken of by Macaulay, has finished his antiquarian studies of decayed London, and comes and places himself on the High Level Bridge to sketch or photograph the ruins of the once mighty city on the Tyne, of the few things that will have escaped the destructive influences of time one in all probability will be a photographic print by the carbon process.

In the very early days of gelatine dry plates, a quarter of a century ago, high sensitiveness of the silver salt was credited to Swan's plates; and, of the old school of wet-plate workers, how few could have been ignorant of the virtues of Mawson's collodion—a vehicle still largely in use? Photographic portraiture, too, traces some of its most gifted producers to Tyneside, and to this day the refined studies of female beauty by Mr. Mendelsohn, and the well-known work of Messrs. Downey, are of their kind unexcelled. The pictorial landscapes of the respected veteran, James Pattison Gibson, the flawless studies and lantern transparencies of Mr. Edgar Lee, and the engineering photography of Mr. Goold and Mr. Parry are widely recognised as having an executive care and finish which touch the limits of present photographic possibilities. After the lapse of six or seven years I can recall Mr. Goold's wonderful photographs of torpedoes leaving a ship's side—then, as now, some of the most striking examples of instantaneous photography conceivable.

The names of other prominent Tyneside workers in photography will occur to you, but your patience is perhaps not equal to a too-extended eulogy. The position of Newcastle-on-Tyne in the first rank of modern photography has been pointed out before—is, indeed, so obvious as not to necessitate reaffirmation; nevertheless, it is fitting that it should be brought once more to the minds of those, themselves photographers, who this week are the guests of a city which, in every photographic aspect, occupies a place of the highest esteem.

WHAT THE FUTURE MAY HAVE IN STORE.

From this tribute to the achievements of the present there is a natural transition, in this year of all years, to a brief meditation on what photography may be reserving for us in the future. Six months hence we close an old century and open a new one. The time has not yet come when the voice to which you are listening and the illuminated scene of which you all form a part are simultaneously transmitted to the ears and eyes of people a great distance away who may be interested; but who will be so venturesome as to doubt the close probability of such an achievement? A glance at contemporary science must convince the student of natural phenomena that finality of accurate knowledge in chemistry and physics has by no means been reached. Remember that it is upon chemistry and physics that practical photography relies. The progressive study of the elements has recently revealed the fact that the table of sixty-five irreducible bodies of which, in our school days, matter was said to consist, must be largely added to. It seems only the other day that the text-books described the atmosphere as a mixture of two gases—nitrogen and oxygen, and yet the presence in the air we breathe of at least two other gaseous bodies has recently been conclusively demonstrated. But perhaps the wonders of physical discovery transcend those of the sister science. Not seven years ago it would have been considered impossible to affect a sensitive plate through an opaque substance by electrical radiations. Röntgen, however, demonstrated that this was a possibility of excited vacuum tubes, and the marvels of X-ray work are now known to us all, and are daily accepted as a matter of course.

It is the fascinating mystery which surrounds the origin and properties of some of nature's forces that supplies the chief source of speculation as to what photography may reveal to us in the new

century. I spoke just now of the possibility of simultaneously transmitting waves of light and sound to a distance. In the case of the latter the telephone has already proved that one half the problem is solved, and, lest any of my hearers may be unduly sceptical as to the possibility of controlling light in a similar manner, they may be reminded that photography has proved the important fact of waves of sound being controlled by the same influence as waves of light. In other words, you can photograph sound as well as light; and, if you can transmit the one, why not the other?

We all know that the interposition of natural darkness is no obstacle to the transmission of stellar or solar light. Some of the rays which nightly or daily fall upon the human retina or the sensitive plate have been travelling for very lengthy periods through space. Much work that has been done in experimenting with the electrical transmission of photographs gives encouragement to the idea that direct photography in the new century will annihilate time and space. Can you not imagine a reflected or lenticular image of a South African battle being transmitted to Newcastle or London, received on a sensitive surface, developed and printed, and the picture publicly shown whilst the battle itself is actually in progress? If it is difficult for you to imagine this, hark back to what I said as to the similarity of the phenomena and properties of light and sound, and the mind may not then rebel at the idea.

To exhaust this suggestion that the limits of photographic action have not yet been reached is clearly impossible in a brief address. My one object in introducing it is to ask those who take photographs without finding the necessity of considering these things to be assured that "sun painting," as it is still sometimes narrowly termed—for, of course, light and its manifestations do not entirely rely upon solar origin—is an art still in its childhood. At any moment, such are the mysteries and complexities which still shroud those natural forces—light, sound, heat, magnetism, and electricity—upon all of which photography more or less relies, and which have such close common relationship—discoveries quite as important and as far-reaching as Röntgen's are probable. Foremost of these, of course, the popular idea will place the photographic philosopher's stone, photography in natural colours. But, if for convenience sake we regard the colours of nature and art simply as decomposed light, then the pictures you will see on the screen this evening must be said to satisfy the theoretical requirements of natural colour photography, for they are spectrum colours more or less pure. Still, these interesting specimens are not what the general public and the writers in the newspapers vainly sigh for. What is scientifically termed pigmentary colour photography—the only process which could gratify a lady's wish to have the colours of her hair, complexion, and dress reproduced by paper photography as they visually appear—gives no clue to us whatever that it is likely to make its appearance yet a while. In the whole vast range of chemical and physical science there is no known theory which points to the likelihood of pigmentary colour photography—the photography in natural colours of the popular idea—being in process of practical evolution. From what study I have been able to give to the matter I will end this reference to it with the remark that, if my hearers are spared a headache until pigmentary photography in natural colours is discovered, they will be free from that distressing complaint for a good many years to come.

PHOTOGRAPHY AT THE PARIS EXHIBITION.

And now let me lead you down from the heights of speculation up which you have been so good as to follow me to the level plain of common interest. The end of the century is unhappily being rounded off by the remorseless God of War; but the gentle lady, Peace, is not wholly thrust out of sight, for she smiles upon us in her sweetest manner from across the Elysian Fields at Paris. It was my good fortune recently to pass some days studying the Universal Exhibition which our neighbours the French have organized. The participation of Great Britain in this wondrous festival of art, science, and industry is not so whole-hearted as that of other countries, and the English visitor may feel some little annoyance or surprise at this fact. But there is one respect in which I sincerely think Great Britain far outshines all her competitors. You are

of course, aware that many people have urged that the Great London Exhibition of 1851 harmed British industry by teaching our foreign competitors our methods of production. Insistence upon this point may be responsible for the abstention of most of our leading manufacturers from Paris this year, but photography comes in to redress the balance. I am happy to say that British photography at Paris is seen at its very best. The pictorial and technical exhibits organized by Mr. R. W. Craigie and General Waterhouse make a show of the greatest beauty and interest. Amateur efforts from Paris and Vienna touch a very high level of pictorial quality indeed; but the British school of work clearly stands above it in right of imaginative and executive beauty. As a case in point, the well-studied gracefulness and refinement of the portrait work sent to Paris by my accomplished predecessor, Mr. Crooke, by Mr. Craig Annan, and Mr. Craigie is not approached by any other exhibits. This I say after carefully studying the photographic work from Italy, Switzerland, Hungary, Denmark, Spain, Germany, and other countries. The same thing may be said of British landscape, figure, and architectural work; the Parisian and Viennese amateurs alone approach it in respect of pictorial excellence. Photographic manufacturers are few at Paris, but they are well represented by Messrs. Dallmeyer, Messrs. Ross, Messrs. Watson, and Messrs. Newman & Guardia, whose well-finished productions worthily represent the manual and mechanical skill of this country. This perhaps is a suitable place for me to mention that, in the sister city of Glasgow, next year, a great International Exhibition is to take place, and I have been assured that British photography in all its branches will manifest itself to the full of its splendid possibilities. I am sure we must all be glad to feel that the first great International Exhibition of the new century is to take place on British soil.

PHOTOGRAPHIC COPYRIGHT, &c.

A word as to a point of material interest. Tennyson's *Northern Farmer*, with his devotion to "property! property!" voiced a sentiment for which no apology is ever called for. Photographers of all degrees and kinds enjoy protection for their work under an Act specially passed in their interests thirty-eight years ago. Recently a secret band of painters and publishers combined for the purpose of inducing Parliament to diminish the value of photographic copyright to the vanishing point. That attempt was abandoned, and a new Bill has been presented to the House of Lords less unfavourable to photography than its predecessor. This Bill is now enjoying the attention of a Select Committee. In the present state of the world's politics domestic legislation of a minor kind has little hope of engaging the attention of the British Houses of Parliament, and the Copyright Bill has no chance of passing this session. No useful purpose would be served by discussing the provisions of a measure which, upon its reintroduction next session, may bear an aspect different from that of its predecessors. But these are the three points which I would earnestly ask all photographers, professional and amateur, to bear in mind for self-guidance when the subject of copyright again comes before Parliament: 1. The existing Act of 1862 is ample protection for all interested. 2. The illustrated press, the publishers, and the painters have combined for the purpose of making photography the defenceless object of plunder and brigandage. 3. Powerful influences are at work to induce Parliament to substitute for the equitable Act of 1862 some measure which will fatally belittle photography in all its aspects. There are representative institutions charged with the duty of defending photographic copyright against these attacks, to which I bespeak the support of all photographers. There is a familiar saying that the tenderest part at which you can strike a man is his pocket. The whole photographic community will be financially affected in an adverse sense if the opponents of photographic copyright get their way in Parliament. Let this fact be realised, and, when the time of struggle comes, photographers throughout the country should be sufficiently numerous and aggressive to influence their representatives in the right manner.

A few brief sentences for that large class with whom year by year I have the pleasure of being brought into intimate contact—I mean professional photographers. To me, as a student of the subject for twenty years, it appears that the greatest hope for the future of the photographic profession rests on two great truths:—1. Only a limited

few of its members have yet risen to an adequate realisation of the pictorial beauties of photography, especially applied to human portraiture. 2. Of the best work that is produced millions upon millions of the general public remain in ignorance. The future is thus with professional photography, and not against it.

Finally, there may be some who are listening to me who have not taken to photography as a recreative pursuit. If such there be, I ask them to accept of my pity and compassion. A practical study of photography reveals the globe and the life that is lived on it in their best and truest aspects. It is one of those intellectual pleasures which help you to assure the cynic that, after all, life is worth the living, and that is best partaken of at the annual gatherings of the Photographic Convention of the United Kingdom, to whose members, after thanking you, ladies and gentlemen, for the patience with which you have listened to me, I conclude by wishing a pleasant stay in hospitable Newcastle-on-Tyne and its charming neighbourhood this week.

THOMAS BEDDING.

PARIS EXHIBITION NOTES.

II.

Of the many lessons which the photographic visitor to the Paris Exposition has the chance of learning, that of comparing the professional portraiture exhibited by different countries should be not the least instructive. Taking the French section first, work by such men as Hanria, of Paris; Belingard, of Lyons; Nadar, E. Piron, Paul Boyer, and H. Provost, all of Paris, supplies what may be taken as a group of representative efforts. The theatrical and the political celebrity is made much of by Parisian photographers, and in this Exhibition the feature is very prominent. Reutlinger, Pierre Petit, and other well-known Paris photographers do not show, but these abstentions can scarcely be set down as a weakening omission. The fact is, portrait photography of the highest class does not seem to have made any converts amongst French professionals. The examples shown at the Exhibition are of that kind which is referred to in this country as good commercial. Artificiality of the theatrical order is seldom absent, and the retouching is always unstinted. The photographs, as a rule, are striking in virtue of the strictest adherence to conventional lines. You search in vain for any attempt to introduce the least subtlety of lighting, or a suggestion that glass-house traditions have been set at nought. It is all plain, straightforward matter-of-fact photography, such as the Royal Photographic Society is seeking next autumn to attract to the New Gallery in a specially provided section. Surfaced prints, carbon and bromide enlargements, to which no possible objection could be taken on the ground of technique, greet you on every side, and you are not left unconscious of the fact that a certain gaudiness characterises the framing. But where is the delicate and restful little "at home" study in sepia platinum, free from harshness of lighting, awkwardness of pose, and vulgarity of surroundings to which so many clever workers in this country nowadays accustom us? Not visible in the French Section at Paris. We must confess that this absence of the pictorial element in French photographic portraiture somewhat astonished us. There would surely be a demand for it if it were properly introduced.

But in Paris, according to all accounts, French professionals hold themselves far too cheaply, a respect in which they are not superior to many of their English brethren. Price-cutting is rampant, allied with the fatal disinclination to take advantage of new ideas which so often attacks photographers of most European nationalities. The irony of the thing lies in the circumstance that the Photo-Club de Paris, a body of amateurs, produces portrait studies resembling in style and treatment the best professional work of this country, but the Paris photographers either shut their eyes to its existence or are ignorant of it. In this country, exhibition-goers have for years had opportunities of studying the work of Messrs. Demachy, Puyo, Darnis, Le Begue, and other prominent members of the Photo-Club, and, among the three or four hundred photographs which comprises the Club's exhibit, we saw a great deal of work which was hardly inferior to that of those well-known exhibitors.

The Société d'Excursions des Amateurs de Photographie also make

display. The probability of any recommendation we might offer French professionals being followed is doubtful, and, while hesitating to record the suggestion that an hour or two passed in studying the productions shown in the British Pictorial Section could be a good investment, we have no scruples whatever in saying that the portrait work of the native amateurs would yield a very good substitute as a source of inspiration.

Sunny Spain disappointed us. The work that represents Toledo and Madrid is so poor as not to deserve a second glance. Larsson, of Stockholm, sends portraiture of a highly retouched kind, but not otherwise noticeable; and the views contributed by Klemming, of Stockholm, are of the cartographical order, which has long since disappeared from first-rate English exhibitions. Hungary is numerically well represented, Mertens & Co., of Budapest; Mai & Co., of Budapest; Strelisky, of the same city; Emil Klegovich, of Szeged; Kossak Jozsef, of Temesvar, and others, sending collections of work. What struck us about the Hungarian portraiture was the magnificent quality of the prints, platinotypes having rich blacks and ure whites; but, in common with most Continental work, Hungarian portraiture appears to suffer from bad vignetting and unsuitability of backgrounds. The pervading idea seems to be to obtain rigid pose, to exhaust the skill of the retoucher, and to make right, striking, and vigorous points. The sitter, in fine, is treated as a map, upon which the best defining powers of the lens and the most strenuous care of those manipulators who handle the picture in its various stages of preparation are concentrated.

Much the same sort of thing has to be said with regard to the professional work from Berlin and Vienna. The saving clause in regard to the latter city is on all fours with that of Paris, the amateurs save the situation. The Vienna Camera Club sends, perhaps, the smallest collection of work to the Exhibition, but it includes examples of portraiture by Von Schoeller, and landscapes, &c., by Dr. Henneberg and Herr Watzell, who are at their very best. In fact, these three men in the half-dozen examples that they send stand perhaps at the highest mark for the marvellous bits of broadly treated work they have executed. We believe Schoeller's portrait was seen in London last year, but the work of Henneberg and Watzell is new to us.

Three other countries come out very well indeed out of the severe ordeal of exhibiting at Paris. Italy is well served by Brogi, of Florence, whose portraits are above the average of quality. There is taste and refinement in the treatment of these, and his reproduction work is also noticeable for the care and apparent fidelity to the original by which it has been executed. Considering the great support extended to the Exhibition in most other directions, it is to be wondered at that so few American photographers make a representation. The burden for sustaining the United States' reputation for high-class work is mainly borne by Messrs. Taber, of San Francisco; Lawrence, of Chicago; Schumacher, of Los Angeles; and W. N. Brenner. Looked at as a whole, this work lacks, perhaps, the tenderness of touch, if we may so express ourselves, which you feel invests the best portraits here—those in the British Section, for example; but it is clever and striking, for all that. American photographers appear to be exceedingly good printers—they do the most thorough justice to negative and positive process. Mr. Schumacher's work gives one the impression of having been produced in a pure atmosphere—it is full of brilliancy and sparkle. As a whole, the American work is characterised by freedom of treatment and an absence of vulgarity. It is not over-retouched, but there is a certain affectation in the fixing which robs it of its highest merit. The fame of Mr. Byron, of New York, as a flashlight photographer, had preceded him. The specimens of his skill that he sends are clever, but not striking.

The Swiss photographic pavilion is well patronised, and, as a collective exhibit, is very high indeed in quality. The Zürich colour-printing houses cover a great deal of wall space with specimens of work which is so universally known nowadays that it does not call for more pointed reference. The leading Swiss portrait photographers send a great deal of large direct work, noticeable for the fact that the images are very often in the brightest colours, carbon printing being presumably the process used. M. F. Boissonnas, of Geneva, has a

distinctive exhibit in the shape of several binocular portraits. If we rightly follow the photographer's *modus operandi*, he takes his portrait stereoscopically, but in the printing gives only one picture, formed by superposing one print on another. Thus you get an effect of diffusion. The theory at stake in this matter is, we presume, the by no means new one, that, as the eyes see two distinct images, it is only necessary to nearly superpose two stereoscopic images to get binocular effect, or, at any rate, some sort of relief. We fear M. Boissonnas is flogging a dead horse. At least, thrice within our recollection has this idea been patented in Britain, and we ourselves had it more than once submitted to us as a novelty. M. Boissonnas, no doubt acting in perfect good faith, thinks he obtains stereoscopic effect in single portraits this way, but we doubt if his clients will be able to realise the phenomenon. The idea will die the death it has died before, we are convinced.

It is to be regretted that portrait photography is so scattered at Paris, but we have endeavoured within the limits of this short article to give our readers an idea of its characteristic features. The Swiss and American professionals and the Austrian and French amateurs show admirable work, watered down by so much from other countries that is lamentably poor.

NOXIOUS GASES.

In a room next to a dark room for several days experiments with acetylene apparatus were carried out; the operators who were working in the dark room were unable to obtain prints on development paper with pure whites. As the first assumption, that the emulsion of the paper used was wrong, proved to be false, the blame was shifted on to the acetylene gas, which had penetrated into the dark room, and this was proved by a series of experiments.

A sheet of paper was, in the dark room, dipped into water through which acetylene had been allowed to bubble. After a few minutes it became yellowed and showed brown stains. A dry plate behaved in precisely the same way, the gelatino-bromide film assumed an intense brown colour. Coarse-grained silver bromide behaved exactly the same as the fine grain.

A light-sensitive film, exposed to an atmosphere of acetylene, was quickly coloured by a mixture of hydroquinone or metol with sulphite without the addition of any alkali. A preliminary exposure produced no stronger colouration.

Prints on a very sensitive bromide paper also became brown in the high lights in a room wherein acetylene had penetrated. The use of very dilute sulphuric acid after fixing removed the brown colour from the prints.

As an explanation of this action, we may assume that acetylene has a reducing action on the silver haloids. In further experiments it was proved that neither hydrogen nor coal gas appeared to have the same action. The second possibility was the activity of impurities in the acetylene. This appeared to be considerably more probable, for the colouration formed on the sensitive films by the action of acetylene appeared to be due to a substance more allied to silver sulphide than pure metallic silver. With dry plates the colouration was not pure black, but brown, and with paper the characteristic metallic iridescence of silver sulphide appeared.

In order to decide these points, water, in which acetylene had been developed, was strongly acidulated with citric acid. We may assume that a pure reduction of the silver haloid would be stopped by this. The action of a phosphorous or sulphur compound actually took place much stronger than before, and the liquid smelt more strongly, exactly like burnt indiarubber. This acidulated solution actually produced an intense brown colouration of a dry plate immersed in it. This action must therefore be ascribed to impurities in the acetylene.

It is most highly probable that the actually active impurity of the gaseous acetylene is not the sulphuretted hydrogen, which is always present, but phosphoretted hydrogen, or gaseous organic compounds of phosphorus.

Phosphoretted hydrogen is, in any case, extraordinarily active with silver compounds, and the best proof of this is the charac-

teristic reaction of this gas with nitrate of silver paper. The smallest quantity, as in Eckelt's tester, colours the paper black by the formation of a silver phosphide; with an excess of silver nitrate this is converted into metallic silver, and becomes grey.

Acetylene will thus have a greater prejudicial action the more it is contaminated with phosphoretted hydrogen, and this depends primarily upon the composition of the calcium carbide. With the better sorts of calcium carbide care is taken that these impurities are as small as possible, but there is still always enough in order to exhibit the described action. On the other hand, it should be noted that the same carbide may develop different qualities of phosphoretted hydrogen, according to the way it is treated. Caro pointed out (*Zeitschrift für Beleuchtungswesen*, 1898, p. 34) that in the first moment of evolution of the acetylene 0·5 per cent. of phosphoretted hydrogen was given off, and later less; further, that a carbide which gave as an average 0·038 per cent. of phosphoretted hydrogen gave off 0·8 per cent. when the apparatus, through insufficient water, became hot.

In exactly the same way phosphorus matches can act if such lie side by side in the same parcel with celloidine, aristotype, or other printing-out paper; the latter may be very soon spoilt by insufficient packing. This can be very easily proved by placing such a match on a piece of these papers. Even after a quarter of an hour a strong colouration with metallic lustre will appear under it, and this discolouration extends more and more sideways.

These reactions are not only of interest for practical work, but possibly through this strong action of a gas may be explained the so-called Russell's effect, that is to say, the action at a distance of printed matter and other bodies on photographic films, and perhaps also later the Becquerel radiations.

R. ED. LIESEGANG.

FOREIGN NEWS AND NOTES.

Three-colour Printing.—The *Photographische Chronik* publishes a very instructive table, given by Hofmann in his recent work, *Praxis der Farben Photographie*. This table gives the colour produced by printing from the three primary negatives, made in five degrees of density. The thinnest negative for each of the primary colours is represented by 0, and the densest by 5. The *Chronik* remarks that, although the table may not be unexceptionable, it is extremely interesting.

Red Plate.	Blue Plate.	Yellow Plate.	Resultant.
Degrees.	Degrees.	Degrees.	Colour.
0	5	5	Red.
1	4	5	Red-violet.
2	3	5	Reddish-violet.
3	4	5	Bluish-violet.
4	1	5	Blue-violet.
5	0	5	White-blue.
1	5	4	Red-orange.
2	5	3	Reddish-orange.
3	5	2	Yellow-orange.
4	5	1	Yellowish-orange
5	5	0	White-yellow.
4	5	5	Reddish-white.
3	5	5	Red-white.
2	5	5	White-red.
1	5	5	Whitish-red.
0	0	0	Black.
0	1	1	Dark brown-red.
0	2	2	Brown-red.
0	3	3	Red-brown.
0	4	4	Brownish-red.
5	5	5	White.
4	4	4	Pale grey.
3	3	3	Grey.
2	2	2	Medium-grey.
1	1	1	Dark-grey.

The Combined Toning Bath.—According to a short note in the *Photographische Mittheilungen*, the condition of the combined

toning and fixing bath prepared with sulpho cyanide of ammonium, without lead, may be considerably improved and approximated to an old bath, by first washing the prints in a small quantity of water, to be added to the toning bath. Dr. E. Hegg, who recommends this, states that the first prints toned in such a bath, instead of being of disagreeable yellowish-brown tone, as is usually the case with a freshly prepared bath, are of a warm brown or violet colour, according to the length of immersion. It is, of course, necessary to avoid diluting the bath, by making it of sufficient strength in the first instance, so that the quantity of water in which the prints are washed shall not reduce it below the normal. To obtain good results with certainty, Dr. Hegg recommends that there should be twenty c.c. of solution to each print 13×18 cm., and that the water in which one quarter to one third of the prints have been washed be added to the bath.

Rontgen Rays and Rheumatism.—At the conclusion of an article by M. Barlet in the *Photographisches Wochensblatt*, the writer mentions that, having read of the alleviating effect of the Röntgen rays in cases of rheumatism, he made a personal trial of the remedy. In the autumn of last year he was suffering considerably from rheumatic pains in the upper arm, which affected its use. He exposed the part to the rays for seven minutes, the tube being placed at a distance of one centimetre, under the influence of a current of 1750 volts strength. The clothes were not removed from the arm. In seven minutes the pain was entirely relieved, and after a lapse of eight months had not reappeared. Another instance is also cited. In this case the patient was unable to move his arm. The part was exposed for two periods of five minutes each, with a short interval. After three minutes' exposure the pain was much reduced, and the arm could be moved slightly. After the second exposure, movement was restored, and only a little difficulty remained in raising and deflecting the limb. A few days after there was a fresh attack of pain, and the patient was compelled to remain in bed and bandage the arm. The doctor ascribed the attack to neuralgia, but recovery was rapid, and there has not been any recurrence of pain. It should be borne in mind that considerable care must be observed in working with an electric current of the strength named. A shock from such a coil might prove fatal.

The Influence of Temperature in Drying Prints.—The influence of heat upon the tone of a print is a well-known fact. Dr. R. A. Reiss, of Lausanne, has endeavoured to ascertain the cause, and gives the result of some experiments in the *Photographische Chronik*. Strips of P.O.P., 6 cm. broad and 10 cm. long, were exposed for various lengths of time to light, toned and fixed in the same combined bath, washed and mounted upon card, and cut in half. One set was dried at the ordinary temperature of a sitting-room, and the other set near a gas oven. The latter were dry in one and a half to two minutes. Those dried by heat had a more glossy surface, and differed from the other set in tone. The difference varied with the thickness of the film, being greater with the more thickly coated papers. Kurz's collodio-chloride paper, which has a very thin film, showed only a slight difference, whilst the Parisian paper "le Collodion" (Trumpet brand), with a thicker film, exhibited a more marked deviation. Lumière's gelatino-chloride paper, which also has a very thick film, showed a very decided difference in tone, the prints dried by heat being much redder and very glossy. In the first trial with Lumière's paper the prints were toned to a brown-red, and in the second to a blue-violet, but the latter, under exposure to heat, also dried to a deep red, whilst the halves allowed to dry spontaneously retained their blue-violet tone. Other makes of paper also exhibited variations in tone according to the method of drying. The writer thinks the change is due to the presence of air and water in the film after washing. When the print is exposed to heat, the surface of the film melts and dries. The air and water below the surface cannot escape readily, and the film consequently swells. On the other hand, when the film dries spontaneously, the air and water are allowed to escape gradually through the surface of the print, and the film is finally thinner than when the print is dried by heat. The writer is continuing his experiments, and purposes verifying the results by measurement of the sections under the microscope.

Mounting Enamelled Prints.—The *Photographische Wochensblatt* states that a highly glazed surface may be preserved if the prints, after fixing and washing, are immersed in a dilute bath of formalin (1 to 4). Before squeegeeing them upon glass or ferrotype plates they should be washed in two or three changes of

water. The prints may then be mounted with paste upon card in the ordinary way, and they will not lose their gloss. When they have been treated in this manner, the prints may even be immersed in water before mounting without much detriment to the glaze. If they are dried off with blotting-paper and fibres remain upon the film, they may be rubbed off when the print is dry, as the formalin destroys the adhesiveness of the gelatine.

Cheap Transparencies.—In the *Archiv für Ophthalmologie* Dr. O. v. Eversbusch mentions that he has found the following method of preparing illustrations for clinical lectures very convenient and inexpensive. Professor v. Labes had engravings printed upon fine tissue paper, treated them with Canada balsam, and mounted them in the ordinary way as transparencies between sheets of glass. Dr. Eversbusch, as an improvement, has had the engravings printed upon celluloid, and has found them a great success. Chromo-lithographs upon celluloid could even be used for coloured subjects.

Aluminium Dishes.—Readers of the *Photographische Mittheilungen* were recommended, in a recently published article, not to use aluminium dishes for development, as the metal was unsuitable when alkaline solutions were used. H. Schumacher writes that, although it is quite true that aluminium is attacked by strong alkaline solutions, the small quantity of alkali used in the development of a plate has no effect upon the metal. He states that he has used aluminium dishes for development for the last seven years, and can recommend them for that purpose, but they should not be used for solutions containing platinum, gold, or mercury, and the metal is also unsuitable for tanks for stand development. It is, of course, necessary to wash out the dishes after use.

Phosphorography.—Dr. R. E. Lisegang finds that phosphorus is very prejudicial to P.O.P. A sheet of gelatino-chloride paper was covered with a sheet of perforated tinfoil, placed in a box, and a couple of ordinary non-safety matches suspended within about two centimetres of the surface. The box was closed for two hours, and it was then found that the unprotected portions of the paper had been strongly affected by the fumes of the phosphorus. Some sensitive bromide paper and some dry plates were also affected under similar conditions, and were amenable to development. Acetylene is always contaminated with a certain amount of phosphuretted hydrogen, and is likewise very injurious to plates and printing papers.

THE AMATEUR PHOTOGRAPHIC ASSOCIATION.

FOUNDED so long ago as 1861, the Amateur Photographic Association of which H.R.H. the Prince of Wales is President, has recently undergone reorganization. The offices have been transferred to the premises of the London Stereoscopic Company at 106, Regent-street, W., and the duties of Hon. Secretaries have been undertaken by Mr. J. Lillie Mitchell and Mr. Butler Humphreys. The Vice-Presidents of the Association are H.R.H. the Duke of Cambridge, K.G., the Archbishop of York, the Duke of Newcastle, the Earl of Rosse, F.R.S., the Earl of Warwick, Lord de Ros, and Mr. James Glaisher, F.R.S. The Council consists of Viscount Maitland, Major-General G. F. Kaye, and Messrs. Charles Stevens, Walter Wood, F.R.G.S., Robert O. Milne, Edward Kennard, M. J. Paterson, and R. W. Kennard. In the explanatory booklet that has just been issued with the idea of presenting the Association in an aspect best calculated to awaken renewed interest in its existence it is pointed out that it has for its object the spread and encouragement of photography by means of an exhibition and the interchange of the work of amateur photographer, and by the opportunity afforded to members of exhibiting at the Annual Exhibition, and participating in the competition for the valuable prizes offered, together with the use of a developing room in the West-end, and, by special appointment, the use of a fully-equipped portrait studio, on payment of a moderate fee, and of having prints executed from their negatives promptly, artistically, and at reasonable rates.

A brief study of the book of rules which has just been issued shows how it is proposed to carry these objects into effect. The Association is open to lady and gentleman amateurs, election being by the Council upon nomination and seconding. The subscription is one guinea a year, but, after December 31 next, an entrance fee of one guinea is to be imposed. We reproduce the essential parts of the rules which relate to

the Annual Competitive Exhibition, as it is hoped to make this feature of the Association's proceedings as important as it formerly was: There will be an Annual Competitive Exhibition (open to all members), held during the London summer season, due notice of which will be given. The Exhibition will be held in the Grand Salon of the London Stereoscopic Company, and will remain open to members and their friends for a period not exceeding one month. The prizes (the selection of which shall be in the hands of a Sub-Committee) shall be awarded by a Committee of three or more Judges, who are not competing, and the Hon. Secretaries, and any other non-competing Members of the Council willing to give their services.

The Association's Challenge Bowl will be competed for annually, and gold, silver, and bronze medals and other articles will be given as prizes. The custody of the challenge bowl is awarded annually to the exhibitor of the most artistic photograph of the year, the name of the winner being engraved thereon. Every member, whether exhibiting or not, shall be presented with a replica of the most artistic photograph of the year, the owner of which has won the custody of the Association's challenge bowl and first prize in Class B. This picture will be supplied at the Association's expense, the size and process being decided by the Council. No photograph may be entered for competition which has already gained a prize in any other exhibition, but it may be exhibited as non-competitive. All Secretarial and Treasurer's duties will be conducted by representatives of the London Stereoscopic Company without charge, the Association however, paying all out-of-pocket expenses. The Judges reserve to themselves the right to limit the number of, or to withhold, the prizes, if in their opinion the exhibits are not worthy of such awards, or if the number of exhibitors in any particular class is deemed insufficient. Prize-winners are to furnish the Association with an unmounted copy of their prize pictures in exact duplicate, if possible, and in the same process as exhibited, with the view to its being placed in the album presented to the Association for this purpose, and which will always be on view at the

The work of reorganizing the Association has only recently been taken in hand, but exceptionally good progress has been made under the direction of the Hon. Secretaries—business men of first-rate administrative ability. Last week the Annual Exhibition was held. It was divided off into about a dozen classes, about 150 photographs being sent in. The Judges were the Hon. Secretaries, Major-General Kaye, and the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY. Amongst the competitors were such well-known workers as Mr. W. Smedley Aston, Mr. R. O. Milne, Mrs. S. Francis Clarke, and others whose names will be found in the published list of awards. Some surprisingly good work was shown, and there appears, from what we can gather, to be so much interest taken in the Association in its new path of usefulness that we shall be prepared to see future exhibitions showing very marked excellence and variety. At any rate, here is the nucleus of an association which should meet the needs of a large class of amateur photographers at the West-end of London and elsewhere who desire to take advantage of the exceptional opportunities offered them for indulging in competitive photography at a summer exhibition. The old Association has entered upon a second youth, and the experience gained in the work of reorganization has been most valuable. Copies of the rules and prospectus may be obtained of the Hon. Secretaries, 106, Regent-street, London, W.

THE SENSITIVENESS OF SILVER AND OF SOME OTHER METALS TO LIGHT.

[A Paper read before the Royal Society, May 31, 1900, and reprinted from the *Chemical News*.]

DURING some recent investigations on the Daguerreotype process, the question presented itself as to which of the elements forming the sensitive surface of the plate—the silver or the halogens—the sensitiveness was due? Now, although the fact that nearly all compounds of silver, especially the haloids, are more or less sensitive to, and decomposed by, the action of light, has long been known, the sensitiveness of metallic silver itself to light, though observed in 1842 by Moser, has never been generally recognised either by chemists or by photographers.

Moser's Experiment.—Before describing my own experiments, it may be as well to give a description of Moser's experiment taken from the original paper in *Poggendorff's Annalen*, 1842, vol. lvi. p. 210.

"A perfectly new silver plate was thoroughly cleaned and polished. A black tablet with various excised characters was fixed above it, without touching it, and the whole placed in the sun for two hours or more, and directed towards it. After the plate, which naturally did not show the

east change, was cooled, it was held over mercury, heated, as usual, to about 60° R. (167° F.). To my great delight, a distinct image of the screen was produced, in which those parts where the sunlight (which, during the course of the experiments, was always weak and changeable) had acted had attracted a quantity of mercury. This interesting experiment was repeated several times with the same result. Sometimes the plates after having been placed in the mercurial vapours were exposed to those of iodine and then placed in the sun, by which the images usually improved."

"If we compare this remarkable fact of the action of light upon surfaces of silver with the above-mentioned phenomena produced by contact, we can no longer doubt that light acts on all bodies, modifying them so that they behave differently in condensing the vapours of mercury. A similar experiment was made with copper during unfavourable weather. The copper was not well polished, and, consequently, the image produced by the mercurial vapour was faint, although clearly visible. By exposing the plate to the vapour of iodine the image became stronger, and this method was found useful in experiments with copper. A plate of clean mirror glass was exposed in the same way to light, and the action was as plain as on the silver if the glass was afterwards breathed upon, the image remaining visible for a long time afterwards. We may therefore assume that light acts on all bodies, and its influence may be tested by all vapours that adhere to the substance or act chemically upon it."

Robert Hunt's Views.—Although Robert Hunt recorded these experiments in his *Researches on Light*, he does not seem to have repeated them as regards the direct action of light upon metallic silver, but to have paid more attention to Moser's experiments on the images produced by contact or proximity of dissimilar substances, and his theory of invisible light, as well as the effects of heat. Hunt's own experiments were chiefly carried out on copper plates, and led him to attribute Moser's results to calorific or thermic radiations rather than to light. Knoor, Karsten, Grove and others seem also to have investigated Moser's theories, but again without taking any notice of the fact of images, either directly visible or developable, being produced on metallic silver by the direct action of light.

I have not been able to find a record of a visible action of light upon ordinary silver plate, though its occurrence should be well known to silversmiths.

Carey Lea's Observations.—Carey Lea found that the three forms of allotropic silver he obtained were all sensitive to light: A, the red soluble, and B, the dark brown or blue insoluble variety, becoming brown after some hours' exposure, while C, the golden-coloured, became lighter by exposure (*Phil. Mag.*, 1891, Ser. 5, vol. xxxii. p. 337).

Electrolytically Deposited Silver.—In a series of electrolytic experiments made in Calcutta in 1892, I found that a golden-yellow or light olive-coloured deposit of silver on the cathode plate (silver or platinum) of a decomposition cell formed with two pure silver plates, as anode and cathode, or with a silver anode and platinum cathode in distilled water, through which a weak current was passed, was slightly sensitive to light, and became lighter in colour by exposure. This seems to confirm Carey Lea's observation, if my golden-yellow silver deposit was analogous to his C product. My deposit being made by electrolysis of pure silver in fairly pure distilled water must have been nearly pure silver, with no traces of foreign substances beyond those contained in the silver or the water, unless there was a small amount of occluded hydrogen, which other experiments of the same series, but with a stronger current, showed might not be impossible.

Photo-electrical Observations in Calcutta.—In another series of observations on the electrical action of light upon silver made in Calcutta about the same time, and published in the *Journal of the Asiatic Society of Bengal*, Part II., No. 1, for 1893, I found that the action of bright sunlight on a plate of almost pure silver, as indicated by a very sensitive Rosenthal galvanometer, was to make the exposed half positive to the unexposed, or as zinc to copper, which would seem to point to some slight oxidising action. The observation, however, was a difficult one, not readily repeated with certainty, and no very definite result was obtained. The currents observed did not appear to be due to unequal heating of the two halves of the plate, because the direct application of heat to the exposed side produced at once a clearly marked current in the opposite direction. This effect was always the same, and could be readily repeated.

In further observations of the same series, in which pairs of pure silver plates were partly immersed in distilled water or good tap water, one plate being exposed to light while the other was covered, as in Becquerel's electric actinometer, the current in nearly all cases, though small, was as above, the exposed plate being positive to the unexposed,

as it generally was when the silver plates were placed in dilute sulphuric, nitric, phosphoric, or hydrochloric acids.

Confirmation of Moser's Observation.—Recent observations of the action of light upon silver, made in connexion with the working of the Daguerreotype process, have fully confirmed Moser's observation quoted above, and shown that silver, when exposed under ordinary conditions, shows distinct sensitiveness to light, and that not only can an invisible developable image be obtained, as was done by Moser, but, by prolonging the exposure, printed-out impressions are produced which are clearly visible after exposure. The difficulty is to make sure of obtaining a surface of pure silver, free from the presence of condensed gases or other foreign matter which might affect the plate and give it a sensitive surface. The silvered glass plates used have generally been cleaned and polished with well-washed tripoli, and the metal plates in the same way, sometimes after being well cleaned with fine emery paper, and, in some cases, after making the metal red-hot.

Various Silver Surfaces Sensitive to Light.—Repeated observations with silver surfaces of different kinds, pure silver plates and foil, silver leaf on varnished glass, Daguerreotype plates and silvered glass, have shown that by an exposure in bright sunshine of about half an hour to one or two hours, under an ordinary black-and-white negative or a cut-out design, photographic images can be obtained, which are sometimes clearly visible after exposure, especially if it is at all prolonged.

Development of Images on Plain Silver Plates.—Whether visible or invisible, these images can be developed by the vapour of mercury, or by ordinary physical development with acid solutions of ferrous sulphate or pyrogallic acid, to which a little silver nitrate is added, as in the old wet-collodion process. The images were also produced when the negatives or cut-out masks were separated from the silver surfaces by sheets of thin mica, which, as Dr. W. J. Russell, F.R.S., has shown, stops the action of vapours upon a sensitive gelatine dry plate, and, no doubt, would do so upon a silver plate. As a rule, the mica itself makes no difference in the action of light, and is quite transparent to it, though, in some cases, it may exercise a slight retarding action. It was found, however, that when the silver surfaces were exposed to light in hydrocarbons, such as fluid paraffin, benzole, turpentine, &c., no action took place under the parts screened by mica, though the fluids were perfectly clear and colourless. Under ordinary conditions of exposure in a printing frame, the mica appeared to exercise no special influence upon the plates, except at the cut edges, as will be noticed further on.

Effects of Pressure.—That the images were not produced by differences of pressure was proved by leaving the mica screen, with the cut-out black-paper design at its back, in contact with a polished silvered glass plate in darkness for twenty-four hours. There was no visible image; but, on development with mercury vapour, the mercury was deposited fairly evenly all over the plate, except just where the outside edges of the mica and the edges of some initials cut in it had been in contact with the silver. Here there was very little deposit, and the edges appeared as dark lines on a white ground. There was no sign of the black-paper design. The fact that the images were readily obtained from ordinary black-and-white photographic negatives is further evidence against the results being due to pressure.

First Experiment with Silver Leaf.—My first experiment was made on August 14 last with a piece of silver leaf laid down on a plate of glass coated with varnish, and exposed in the sun for a short time under a plain cut-out cardboard screen. On developing with mercury vapour, a faint image was visible, the mercury having deposited on the part exposed to light.

Next day the experiment was repeated. A similar plate was exposed under a black-and-white gelatine negative of some lace for half an hour in bright sunshine. On developing with mercury, a very distinct, though faint, image of the lace pattern was produced, the mercury again depositing on the parts exposed to light, as in Moser's experiment.

Effect on Polished Silvered Glass.—Thinking that these results might be partly due to some action of light upon the varnish underlying the silver leaf, a piece of polished silvered glass was exposed under the same negative for about an hour. Again a distinct image was developed with the mercury, but partly positive and partly negative. A somewhat similar result was obtained on another plate developed with the ordinary acid iron and silver developer already noticed.

Effect on Pure Silver Plate.—The next experiment was with a piece of nearly pure silver plate, carefully cleaned with "Globe" polish, and washed with benzine to remove all greasiness. After half an hour's exposure in dull sunlight and development with mercury, an image was produced similar to the two first on silver leaf, i.e., the mercury had deposited upon the exposed parts.

These experiments with three different forms of silver surfaces and two methods of development, all giving results similar to those obtained by Moser, seemed at any rate to prove the correctness of his observation, and the sensitiveness of ordinary forms of silver to light.

With the exception of the first, the foregoing trials were all made with a black-and-white negative on glass. Others were then made with cut-out black-paper screens and with like results.

Observation of Printed-Out Visible Image.—The first observation of an image visible on the silver surface after exposure and without any development was on a plate of nearly pure silver, cleaned with tripoli and ammonia, polished off with dry tripoli, and exposed on August 21 for about half an hour in sunshine under a black-paper cut-out screen. The parts exposed to light appeared lighter than the unexposed, but, on development, the mercury was deposited upon the unexposed parts. In this case the surface may have been affected by the ammonia used in cleaning, but it is also likely that the black paper used for the mask exercised some effect, as was afterwards found to be the case.

Another silver plate exposed for the same time under the same cut-out mask, but separated from it by a sheet of mica, did not show the visible image after exposure, though an image was readily developed with mercury vapour.

A day or two later, on August 24, the same experiment was repeated upon a plate of silvered glass exposed in the sun for half an hour under the cut-out mask, with a mica screen between it and the silvered surface. The image of the black-paper design could be faintly, but distinctly, discerned in a suitable light, again appearing dark upon a lighter ground. Development with acid iron and silver brought out clearly the images of the paper mask, and of some letters cut out of the mica screen, as well as the edges of the mica screen itself.

A piece of silvered glass was then exposed for forty-five minutes under the same black-and-white negative as used in the first experiments, the silvered surface being protected from contact with the negative by a mica screen. In this case also a faint image was visible after exposure.

Several other prints, both from the lace negative and the paper masks, were made on silvered glass with longer exposures, so as to obtain a distinctly visible image, and it was then found that there was a tendency to reversal of the image when developed with mercury vapour, *i.e.*, the mercury deposited upon the unexposed parts instead of upon the exposed. In one plate the image thus produced from the negative of lace, exposed for two hours in the bright August sunshine, has quite the appearance of an ordinary Daguerreotype picture on an iodised silver plate, though no halogen or other sensitiser was used.

Further trials of prolonged exposures of pure silver foil or plates, carefully cleaned with dry tripoli powder, have given very distinct printed-out images on the metal, so that there is no doubt about the fact that visible images can be produced on clean plain silver surfaces by light.

Blue Rays found to be Active.—In order to ascertain, if possible, what rays were active in producing these visible images upon the silver, and as it was hopeless to expect to obtain satisfactory results from observations with the solar spectrum, a slip of silvered glass was exposed under a small artificial spectrum of seven coloured glasses. After forty-five minutes' exposure in sunshine very faint images of the violet and cobalt blue glasses were distinguishable, but showed more distinctly when breathed upon. A similar result was obtained upon a pure silver plate, and, on developing with acid iron and silver the space exposed under the cobalt-blue glasses, developed out quite clearly, with traces of the violet and blue-green glasses. This result quite agrees with an observation made by Moser that only the blue and violet rays have any influence on pure silver, for he obtained very clear images by means of glasses of these colours, while only traces could be rendered visible when red glasses were employed, although they transmit more light and heat.

On another silvered glass plate, exposed under a similar colour screen or artificial spectrum, consisting of fifteen coloured glasses, for three hours in bright sunshine, the image has apparently reversed by over-exposure, the mercury being deposited on the spaces exposed under the red, orange, yellow, and yellow-green glasses, but not on those which were under the blue-green, blue, and violet glasses.

As we have seen, Robert Hunt was inclined to attribute Moser's results to the effect of heat or differences of relative temperature rather than to light or solar radiations, but his experiments were mostly carried out on copper, which is, as I have found myself, much more sensitive to rays of low refrangibility and to heat than silver is.

Developable Images Produced on Silver by Heat.—Towards the end of September, when the weather was much cooler than it had been at the commencement of my experiments in August, I found that there was a distinct falling off in the sensitiveness of the silver surfaces, and it

seemed that Hunt's view might, at any rate to some extent, be correct. I therefore tried an experiment to see if the same developable images could be obtained by heat as by light. A silvered glass plate was polished and put into a printing frame with the cut-out paper mask and mica screen, in which were the cut-out initials, just as if it were going to be exposed in the sun, but it was gently warmed for about five minutes over a spirit lamp, and then developed with mercury. The cut-out initials and edges of the mica came out distinctly in dark lines, just as they did in the pressure experiment, but there was also a clear image of the black-paper mask, which developed lighter than the ground, by the deposition of mercury, or the opposite of the ordinary action of light.

This is a very interesting observation, but recent repetitions of it with silvered glass plates and clean silver foil have quite failed to give such a distinct image of the black paper, though traces of it have been visible, and the edges of the mica and of the cut-out initials were always clearly impressed. In one case, when the silver foil was well heated to redness on both sides before being placed in the printing frame and the subsequent heating, no image of the initials was obtained, and only part of one edge of the mica screen with a faint trace of one corner of the paper mask where there was extra pressure. From this it would seem that heat does not play any active part in the production of the images, though the higher temperature of the summer sunshine, as well as its greater actinic power, may accelerate their formation by light. This is, to a certain extent, proved by the fact that the most perfect printed-out image obtained on a pure silver plate was exposed for three days at the end of September, when the thermometer exposed in the sun at the same time did not rise above 64° F., so that there could have been no question of heat producing the effect, as there might have been under the hot, clear sunshine of August.

Protection from Air.—In most of the experiments the plates were protected by glass during exposure, so that the outer air had no direct access to them. When plates were exposed under mica screens and without the protecting glass, the outside unprotected surface became distinctly yellow and tarnished with long exposures.

Under Surface of Silvered Glass Plate not Sensitive.—In order, however, to ascertain the effect of cutting off all atmospheric action on the exposed side, a silvered glass plate was exposed from the back or glass side under a cut-out mask made of thin aluminium sheet, and exposed for four days in October, two days being sunny and two cloudy. There was no visible image on either side of the plate after exposure, but breathing showed an image on both sides. The plate was then developed with acid iron and silver, and showed the image not very distinctly; but, as development was prolonged, traces of it appeared at the back of the silver film quite clear of deposit, so that apparently the developer had worked through the protected parts of the film, while the exposed part had taken the deposit of silver. When the plate was dry, there was, curiously enough, no trace of the image on either side of the plate.

This experiment was repeated in January, two silvered glass plates being exposed face to face for fifteen days, of which five or six were sunny and the rest fairly bright, with the object of also seeing whether an impression could be made through the upper plate on to the silvered surface of the under one. On developing with mercury, a fairly clear image of the cut-out design was obtained on the inner surface of the exposed plate, dark on a lighter ground, but neither on the outer exposed silver surface of the upper plate, nor on the silvered surface of the lower plate, was there any trace of an image. The experiment was repeated with a similar result. The only other case in which images have been obtained through the silvered film was on a plate partly fumed with hydrogen peroxide and developed with mercury, but much overdone. As far as they go, the experiments show that the visible image is not produced on the silver except more or less in contact with the air. Further trials in bright, sunshiny weather are required to prove this.

SCIENTIFIC TRANSLATION.

GLANCING over the list of scientific books which are published each year in ever-increasing numbers, one finds that not a few of them are translations of German and French works, which have been deemed of sufficient importance and value to warrant a reissue in England or the United States. The introduction to English-speaking scientists of works whose writers are respected as authorities is, says the *Scientific American*, undeniably praiseworthy; but the ragged English in which the thoughts of these foreign authors have been clothed must give us pause and cause us to reflect whether engineers and chemists would not do well to brush

up their German and French, mildewed by long disuse, and to read in their undefiled native language those works which are now presented in uncouth dress.

The translation of a scientific treatise is both more difficult and more readily accomplished than the translation of a novel or essay; more difficult because it requires, in addition to a mastery of two languages, a reasonably thorough knowledge of the subject under discussion; more readily accomplished because elegance of expression must give place to accuracy of translation. Indeed exactness is the prime requisite of a rendering of a foreign scientific work.

But sometimes it happens that a scientific writer is not only a man of thought, but also a man of considerable literary ability, who clothes his thought in phrases and sentences artistically formed and grouped. The translation of the writings of such a man ceases to be merely an intellectual task, it becomes an undertaking in which the feeling and good taste of the translator are called into requisition to reproduce as faithfully as possible the style as well as the intellectual traits of the original. A Frenchman who would construe into his mother-tongue the lectures of Huxley and Tyndall would seek to convey in his version something more than the mere thought of his original. He would endeavour to reflect the style as well—not that he would ever fully succeed, for the idiomatic grace of one language can never find an exact counterpart in another; but he would deem it necessary to convey to his readers something of the colour, the music, and suggestiveness of the English work. In short, he would attempt to reproduce the man, even to his mannerisms, as well as the thought of the man.

That most scientific translators fail to catch the style of the foreign author is too often due to a deficient knowledge of their own language. A well-known and most successful translator of novels, a woman who has presented to Americans many of the most popular works of German fiction, once remarked: "Anybody can find out the meaning of a French and German text; that is simply a matter of using a grammar and a dictionary. The secret of making an acceptable translation lies in the ability to express that meaning in good English."

But, granting that the dictionary is a matter of secondary importance to the translator of novels, it cannot be denied that it is well-nigh indispensable to the man who is rendering into English the works of a foreign scientist. As the late Master of Balliol was wont to say, no one is infallible—not even the youngest of us. No translator can be expected to know the English equivalent of every foreign technical term, he must of necessity have recourse to a good lexicon in which he is sure to find reasonably accurate translations of technical phrases. But unfortunately the dictionaries at present in use are most dangerous things; that they are for the most part old is pardonable, but that their definitions should often be inadequate and sometimes inaccurate is inexcusable.

Few works become so quickly antiquated as scientific dictionaries. An invention frequently requires the coining of an entire terminology to define the new contrivance and its functions. The introduction of the phonograph and telephone, the invention of the steam-engine and dynamo-electric machine, the discovery of the Röntgen rays, have each been the means of enriching our scientific vocabulary with words that have been immediately seized and absorbed in the technical speech of the day. Although of new mintage, these terms are as commonly used as any in ordinary mechanical parlance. Obviously the dictionary in which they are not contained is incomplete; and yet most of the purely technical dictionaries are so lamentably deficient in this respect, that, for example, many of the terms used in electrical engineering for the last fifteen years find no place in their pages.

For this reason the task of the scientific translator is rendered doubly difficult. In order faithfully to render a scientific treatise into English he must, in a measure, be independent of the lexicon; he must be sufficiently conversant with the topic under discussion to supply, when his dictionary fails him, a correct translation of a term, and to select from a number of meanings that which adequately fills his needs. We shall not readily forget a translation of an article on a German air ship, published in a prominent American newspaper, in which the German word for "car" (Gondel) was literally translated by "gondola," an example either of a too slavish adherence to the original or a lack of judgment on the part of the translator.

The habit of consulting a good technical dictionary is one of the means of cultivating a nice appreciation of distinctions in scientific synonyms. One acquires, moreover, an excellent understanding of the possibilities of one's mother tongue as well as a knowledge of its defects and of its advantages over other languages. The English translator will tell you that, of all languages, French is the most idiomatic, German the least;

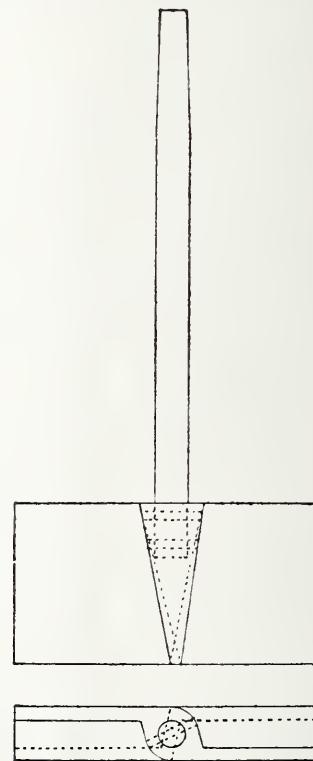
and, although he has not the blessed German privilege of compounding words *ad libitum* to meet his special requirements, he rejoices in that wealth of synonyms which enables him to render a foreign sentence into good Anglo-Saxon with much of its original vigour and idiomatic connotation, and to give to his translation all the marks of an English work, with no trace whatever of the foreign idiom.

GELATINO-CHLORIDE EMULSION.

II.

THE method of mixing is a point upon which the authors of various formulæ agree to differ, some saying that the silver must be added to the gelatine solution first, while others are equally as sure that it must be added last; the best way for any one to convince themselves, is to try both methods, and then the writer is quite sure that they will advocate adding the silver solution last, for, on adding it first, the gelatine will be found to discolour, especially if it stands in the light, as silver combines with gelatine, and this seems to be accentuated by the action of light, and a reddish-brown tinge is imparted to the gelatine which cannot afterwards be eradicated; so the writer unhesitatingly pronounces for adding the silver last, in any case it is not advisable to add free silver to gelatine, a much better result being obtained by forming citrate of silver first.

It will be found rather hard and tedious work to mix any quantity of emulsion by hand, besides which it occupies a good deal of time, and the grain obtained is not so fine as might be wished. The writer has found the following little contrivance succeed admirably, as the chloride is formed right through the emulsion; it may be driven by a treadle with the foot,



Mixer.

or, better still, by a small motor, either water, electro, or air; as very little power is required, it should be driven at about 150 revolutions per minute, and the writer is confident that a beautifully fine grain will be obtained, very much better than can be procured with the generally recommended shaking and stirring, at infinitely less time and trouble. The details will be seen from the following sketch.

This mixer should be made entirely of mahogany, both blade and stem. The latter should fit tightly into a hole drilled in the former, and be fastened in by wooden pins, also made of mahogany. No metal pins, nails, or glue, must be used for this, otherwise the emulsion may be spoilt. The writer has tried aluminium for the blade, and, although it does not hurt the emulsion, the alkalies forming the emulsion attack the aluminium, turning it black and making it difficult to clean. Before using the mixer, the blade and bottom part of the stem should be well soaked in methylated alcohol, to decolourise the wood as much as possible, after which no trouble need be feared with it. The only attention required is a wash in warm water after using. The top end of the stem should be tapered off, and may then be fitted into a socket, driven by a motor. It can be forced into the socket by hand, and is then easily

withdrawn when required. This will be found quite tight enough to drive, as very little power is required unless the quantity of emulsion is very large. The effect will be found very good, as it forms quite a vortex, and the chloride can be seen forming right through the emulsion from top to bottom, thus ensuring a very fine grain, more especially if the solutions are placed in a glass funnel having a small piece of glass tubing drawn out to a fine point, and attached to the stem of the funnel with indiarubber tube, with a small pinch-cock on this. The solutions are obtained in a very fine stream, which can be regulated at will, the funnel being supported upon a retort stand, thus leaving the hands at liberty. The emulsification proceeds with the greatest regularity, and, as it requires no attention, except to see that the funnel is kept filled, other preparations may be made during the operation. A small plugget of cotton-wool should be placed in the neck of the funnel to arrest any impurities which otherwise would stop up the fine tube.

When the gelatine is thoroughly dissolved, No. 2 should be heated to 100° F. and added. This may be poured in fairly quickly, stirring all the while, or mixed with funnel and mixer if desired. Up to the present the operations may be conducted in daylight, but the emulsification must be effected in a darkened room, an orange-yellow light being sufficient. Artificial light, such as candles, oil lamps, incandescent electric, or ordinary gas may be used, but not acetylene, incandescent gas, or electric arc. No. 1 should be heated to 100° F., and either poured in very slowly, stirring vigorously while doing so, or the mixer described above, and the aforementioned funnel should be used, when a splendidly fine-grained emulsion should result. A glass rod should be dipped into the emulsion, and if the emulsion has been properly prepared, on looking at gas or other light through the bead of emulsion which collects on the end of the rod, a rich orange colour should be noticed.

The writer thinks that no gelatine obtainable commercially is sufficiently hard for gelatino-chloride emulsions, so he advocates the addition of a hardening agent. No very great quantity is required or the gelatine will be turned into an insoluble lump. The usual hardening agents for gelatino-chloride emulsions are chrome alum and formalin. The former is a very good hardening agent, despite the fact that it contains sulphur, but, unfortunately, it gives the emulsion a peculiar greenish hue, so the writer prefers to add to the above quantity of emulsion one drachm of a four per cent. solution of formalin, this will be about the right quantity for either Winterthur's or Fischer & Schmitt's gelatines; but, if other gelatines are used, it will be necessary to experiment with them before adding, the aim being to get as tough a film as possible, without precipitating the gelatine, or detriment to the working of the film, so that any hardening agent should be used with discretion. If chrome alum is preferred, 6 grains should be dissolved in 2 drachms of water, and added to above before filtering. Formalin should be added after filtering. Concentrated solution of alum or formalin should not be added to gelatine. The emulsion should be raised to not more than 120° F., and filtered.

The mixer and filter should be kept in a dark room as much as possible after being used, for otherwise they discolour.

In making gelatino-chloride emulsions, a good result is obtained by adding a small quantity of alcohol, to make the emulsion flow more easily; no great quantity should be added, or the gelatine would be precipitated. The writer believes with Captain Abney that the best quantity of alcohol for the above amount of emulsion is 3 drachms. Methylated alcohol answers perfectly well, providing it is methylated with wood naphtha, and not mineral naphtha, as the latter is of an oily nature, and is sure to cause trouble in the coating. A simple way to test for the presence of mineral naphtha is to pour a small quantity of water into the alcohol, when, if mineral naphtha is present, the alcohol will immediately become cloudy, while, if wood naphtha is the methylating agent, no change in the brightness will take place. The alcohol, not necessary, should be added after filtering, and the emulsion should then be allowed to cool to about 90° F., which will be found the most convenient temperature for coating.

The following is a very good formula containing alum :—

FORMULA II.

No. 1.

Recrystallised silver nitrate	150 grains.
Citric acid	40 "
Distilled water	1½ fluid ounces.

No. 2.

Tartaric acid	20 grains.
Sodium bicarbonate	10 "
Alum (potash)	15 "
Water	1½ fluid ounces.

No. 3.

Hard gelatine	480-500 grains.
Sodium chloride	20 "
Rochelle salts	20 "
Water	7½ fluid ounces.
Alcohol	3 drachms.
Formalin four per cent. solution	50 minims.

In this formula the method given in Formula I should be followed. The effervescence in No. 2 should be allowed to subside before the alum is added, and left to dissolve before adding to the gelatine solution. This forms what is known in the dye trade as basic alum. Besides exercising a hardening influence upon the film, both the alums and formalin act as antiseptics to gelatine. It may be thought that, as formalin is obtained in a forty per cent. solution, it is a waste of time to dilute it to four per cent., and that five minims of the concentrated solution might be added; but the concentrated solution would precipitate the gelatine in lumps, without exercising the proper effect upon the film. The same remark applies with equal force to the alums, which should be well diluted before using. Some of the published formulas advise adding such a large quantity of alum, that a moderately hard gelatine is turned into an insoluble lump, so that, when trying a new hard gelatine, it is advisable to add the necessary proportion of alum or formalin to a small quantity of the gelatine, and see whether the effect is right, before wasting further time and chemicals.

Glass jars should not be used for making gelatino-chloride emulsions, as the heat is liable to crack them. The writer has seen large quantities of finished emulsion wasted, through the bottom of the glass jar cracking, and falling out, and, as any one who has worked with salts of silver knows, the stains upon the person, clothes, and floor are very difficult to eradicate. When possible, white or very light cane-coloured earthenware-jars should be used for gelatine-emulsion making, as they show up any dirt or old emulsion left in the jar, which would spoil the colour of the emulsion. The safest plan is to wash the jar out with warm water before placing the gelatine in it.

Glycerine is sometimes advised to be added to gelatino-chloride emulsions, but the writer disagrees with this view, as there seems no advantage in using it with a gelatine film, which can always be softened by immersing in water, while a great disadvantage is that it keeps the film in a moist state, and thus affects its keeping properties.

The writer strongly advises that only the sulphocyanide bath should be used for toning the above, as very much better and more satisfactory results are obtained with this bath than with any other, at a less expenditure of gold. The following will be found quite strong enough :—

Ammonium sulphocyanide	15 grains.
Gold chloride	1½ "
Distilled water	8 fluid ounces.

If a stronger bath is desired, the gold may be raised to 2 grains and the sulphocyanide to 25 grains, but it must be borne in mind that double toning is more likely to take place with this bath than with the former, although the stronger bath will give dark tones better than the weak one. A point to be remembered is that considerable reduction of the print always takes place on first immersing in a sulphocyanide toning bath, the prints assuming a peculiar yellowish colour; but the density is soon recovered, and toning should then proceed with the greatest ease and regularity if the bath is in proper working order.

As the question of coating and the kind of paper to be used will make this article rather too long, the writer proposes to deal with them subsequently.

C. T. SUTTON.

IMPROVEMENTS IN DEVELOPING AND FIXING.

[Thornton & Rothwell's Patent No. 17,292 of 1899.]

THE invention consists in preparing each sensitive plate or film with a developer or combined developer and fixer, applied thereto in suitable dry form, and protected by an air-tight covering, so that, by immersion in the necessary quantity of water, an active solution is formed at the time of development, separately for each plate, sufficient for developing and fixing the negative.

The patentees incorporate the developer and the fixing medium, so that, when dissolved in water, a solution is prepared which effects the double functions of developing and fixing the image. Although they prefer the developing and fixing medium mixed or incorporated, and then applied to the plate, the developing medium only may be so applied.

Any suitable developing or developing and fixing mediums may be employed, which can be put up and packed with the plates in dry form. The following may be taken as examples of suitable preparations, the proportions being enough for each plate of quarter-plate size :—

DEVELOPER.

Pyro	2 grains,
or—	
Hydroquinone	3 ,,
or—	
Metol	2 ,,
and—	
Hydroquinone	2 ,,
Carbonate of soda anhydrous	10 ,,
Sulphite of soda anhydrous	10 ,,
Potassium bromide	½ grain.

COMBINED DEVELOPER AND FIXER.

Anhydrous sulphite soda	15	grains.
Powdered caustic soda	9	"
Anhydrous hyposulphite soda	20	"
Grind together, and add—		
Kachin or pyrocatechin	9	"

The developing and fixing medium is made up in the form of a strong solution with sugar or dextrose, and then applied in one of the following ways:—

(a) The plate is coated on the back with the solution, and, after the latter is dry, over this is placed a sheet of air-tight material, such as paper, soluble gelatine, or other material, which will prevent the action of the air upon the developing medium, and will prevent it coming into contact with adjacent plates, and which will readily separate or dissolve on immersion in water.

(b) The prepared solution may be coated upon a paper backing sheath or envelope, which covers or protects the plate, and which, at the same time, serves as an air-tight protection for the developing and fixing medium as applied to rolls; the covering material may be attached to the back of the sensitive film, or a loose paper backing may be wound up with the film, and removed or discarded when the film is cut up into plates.

The effect of the combination of the developing and fixing medium is a great improvement upon what has hitherto been done, because it not only dispenses entirely with all chemical solutions in bottles (a great advantage to travellers), but it also renders a dark room entirely unnecessary, as the plate can pass from the camera, after exposure, direct into a trough or tank, in which it is both developed and fixed. By making this tank of red, yellow, or other non-actinic glass or transparent celluloid, the progress of development and fixing can be easily seen, and the plate removed when desired. It is, however, not essential to watch the progress, as, by combining the fixing with the developing operation, no serious result will happen to the picture should the plate be left in the tank rather too long.

By the invention it becomes possible to remove the plate from the tank in daylight as soon as developed, whereas this was not possible hitherto, because, if the plate was removed from the developing tank to a separate fixing tank in daylight, the image became fogged by the light during transference from one tank to the other, and all devices hitherto proposed in which the two tanks were enclosed from daylight by some box or covering chamber other than a dark room were unsatisfactory, as accidental mixing of the solutions frequently occurred and spoiled the image.

After the plates have been developed and fixed outdoors or away from home, we prefer to leave the necessary operations of washing to free the plate from all traces of chemicals until the operator returns home. In order to facilitate this, and prevent any injury to the plates in the mean time, a grooved box or equivalent device may be employed, into which the wet plates can be placed without touching each other. The box is closed by a lid or door, and may afterwards be used as a washing tank without removing the plates therefrom.

To develop, the covered plate may be immersed complete in the water, which dissolves the developer and softens the covering, permitting the latter to be removed or thrown away.

IMPROVEMENTS IN THE DEVELOPMENT OF PRINTING PAPERS.

[Thornton & Rothwell's Patent No. 17,738 of 1899.]

THE invention consists essentially in coating the back of the printing paper with a concentrated solution of the necessary chemicals to produce, when dissolved in water, a developing and fixing solution.

The patentees prepare a concentrated solution of the developing and fixing medium with a soluble cement or adhesive such as gum, starch, dextrose, sugar, or the like, which can be easily applied to the surface of the paper, will dry or set hard thereon, and be readily dissolved again when immersed in water.

The following may be taken as examples of suitable preparations:—

DEVELOPER ONLY.

Metol	2	grains.
Hydroquinone	2	"
Carbonate of soda (anhydrous)	10	"
Sulphite of soda (anhydrous)	10	"
Potassium bromide.....	$\frac{1}{2}$	grain.

DEVELOPER AND FIXER COMBINED.

Sulphite of soda (anhydrous)	15	grains.
Powdered caustic soda	9	"
Hyposulphite of soda (anhydrous)	20	"
Kachin or pyrocatechin	9	"

FIXER ONLY.

Hyposulphite of soda.

These materials are made into a strong solution with sugar or dextrose and applied to the paper, the concentration of the solution being regulated according to the amount required on the paper.

The back of the printing paper is rendered more or less waterproof by a coating of an impervious material before the solution of the chemical medium is applied, in order to prevent any penetration through the paper of the chemical medium which would damage the sensitive coating on the face. Celluloid or other waterproof varnish, or other suitable material, may be employed for this purpose, but we prefer the product obtained by treating or dissolving the zinc or aluminium salts of the fatty or resin acids, or a mixture of these salts, with a suitable volatile solvent, such as benzole, coal tar naphtha, benzoline, or other similar light hydrocarbon, and drying or solidifying the same in the presence of heated air.

Upon the paper is first spread the waterproofing material, then it is coated with the chemical medium and finally dried. The layer of chemical medium may be protected by a sealing sheet or coating of air-tight material solubly attached thereto, such as paper, soluble gelatine, or other suitable material, thus enclosing the chemical medium between the paper and the air-tight covering, which will prevent the action of the air upon the developing medium, and will prevent it coming into contact with and damaging the adjacent sheet of printing paper.

For development papers, such as gelatino-bromide of silver, gelatino-chloride of silver, and the like, we may use a developer only, but we prefer to use a combined developer and fixer.

For print-out papers, such as gelatino-chloride, collodio-chloride, and the like, we may use a combined toner and fixer, or, if the toning chemical is incorporated with the sensitised coating (as is possible and sometimes done), we simply apply the fixing chemical to the back of the paper.

In use, after the prepared sensitive paper has been printed in the ordinary way, it is immersed in water, and kept in motion therein until the chemical medium attached to the back completely dissolves. The solution thus produced develops, fixes, and completes the print, the paper being allowed to remain in the solution any desired length of time. It is subsequently well washed in running water to remove all trace of the chemical medium, and dried in the usual way.

Studio Gossip.

MOUNTING.—A mixture of gelatine and arrowroot makes a good mountant, which does not injure the glazed surface of P.O.P. so much as does simple starch paste, points out *Photographic Scraps*. Take of gelatine 100 grains, which should be by preference the thin colourless gelatine usually sold in sheets. Cut this up into very fine shreds and, after soaking it in 3 ounces of water for about five minutes, add to it 200 grains of arrowroot; mix well while cold and apply heat until the gelatine is dissolved and the arrowroot broken up, stirring well all the time. While still warm add 2 drachms of methylated spirit a little at a time, mixing thoroughly after each addition, and about 3 drops of oil of cloves. When cold, a firm jelly will be produced, which, with a stiff brush, may easily be worked upon the dry print. In mounting dry bromides considerable difficulty is usually experienced in making the print adhere to the mount round the edges, as a most persistent curl is generally present. To overcome this, when the print has been placed in position and squeegeed down, take a moist piece of chamois leather and gently press the edges of the print all round. This damps the gelatine surface, causing it to curl the other way, thus effecting perfect contact. When using the commercial mountants, care must be taken that none of the preparations strays to the front of the print, especially in very glossy ones, or the mark will be difficult to remove successfully.

A POSTER ACADEMY.—A writer in the June number of the *Poster* (an excellent publication) remarks that "the idea of a Poster Academy—the outcome of the article, 'Why not a Poster Academy?' in the last number of the *Poster*—is one which should secure the active support of both artist and advertiser. The artist, instead of hiding his talent in his studio, will be enabled to display such where it can be appreciated from both artistic and commercial standpoints. Further, the artist, aware of such an opening for the exhibition of his skill, will be encouraged to do his very best work. On the other hand, the wide-awake advertiser would be afforded an opportunity of inspecting a representative selection from the works of the leading poster artists. The busier and more important advertiser cannot waste so much time as would be involved in the visiting of even two or three artists' separate studios. Besides, he is deterred from adopting this, to him, extreme measure by fear of not finding something suitable, or through fear of being expected to purchase what he may not fancy. Looking at the matter, first from the artist's standpoint and then from that of the advertiser, I must say I feel that a Poster Academy is just the very thing needed to bring the artist's work and advertiser together. There is no better *locale* for the headquarters of such an Academy than the Crystal Palace, more particularly as the 'Great Glass House' is now so popular a centre for trade exhibitions. Since writing the last paragraph I see that the Poster Academy idea is taking practical shape. The initiative was taken by several well-known artists, including Messrs. John Hassall, Cecil Aldin, Robert Sauber, Tom Browne, W. S. Rogers. Mr. Austin Fryers has been selected as hon. scribe. I wish them every success."

News and Notes.

ROYALTY AND ANIMATED PHOTOGRAPHY.—The *Daily Telegraph* states that Mr. R. W. Paul, whose services at their river *fête* were invaluable, succeeded in obtaining a very good animated picture of the Prince and Princess of Wales at Chelsea. It is a unique animated photo of their Royal Highnesses, as they approach the camera (passing down the lines of soldiers' wives) in such manner as to give most effective portraits. The Princess has asked for a copy, and the picture is to be exhibited at the Alhambra.

MR. J. E. AUSTIN.—Of this once well-known exhibitor of photographs the Camera Club *Journal* tells us that, "playing in the Croquet Championship Meeting at Wimbledon last month, he beat all comers, and is now the Champion Croquet Player. The *Illustrated Sporting and Dramatic News*, of June 1900, contains a portrait of our member playing in his own particular style and with his own particular mallet, which mallet is his own particular invention, and to which he gives his own particular name. Mr. Austin is an old Rugby boy, and a member of Oxford University. At the Camera Club he is known as a consummate story-teller. He is a man who excels in everything that he takes up. Some years ago it was photography, now it is croquet. We understand that Mr. Austin only took up croquet-playing seriously about four years ago. The rapid way in which he has risen to the top is characteristic of the man."

THE ABSENT-MINDED BEGGAR "TIT-BIT" FUND.—Mr. William Tylar sends us a copy of a letter just received from Dr. Hall-Edwards, acknowledging receipt of photographic sundries, the result of the Tit-Bit Camera Fund, to which we gave publicity a few months ago:—"Imperial Yeomanry Hospital, Deelfontein, South Africa, June 11, 1900. DEAR MR. TYLAR.—The box containing the apparatus kindly sent by you as the outcome of the Tit-Bit Camera Competition, reached me yesterday, and I can hardly tell you how delighted I was with the contents. I am distributing the stereoscopes and slides to the various wards, and am sure the patients will derive much pleasure from them. I have given the field glasses away so generously sent by Mr. Kent, optician, Staines, and you may be pleased to hear that each of our five Birmingham policemen have had one. I took several photos with the stereoscopic camera this morning, and they all turned out well. I have done a very large amount of photographic work, over 300 whole-plates and 250 quarters. I gave the views on the Thames to our commandant (Colonel Sloggett), he has decorated his house with them and they have been much admired. Please convey my most grateful thanks to the subscribers to the Fund and accept same yourself.—In great haste, yours very truly, J. HALL-EDWARDS, L.R.C.P., &c., Surgeon-Radiographer to I.Y.H."

Commercial Intelligence.

MESSRS. WYNDHAM & CO., of Mill Hill Park, Acton, London, W., write that they have purchased the business carried on since 1896 by Messrs. Walford & Co., Limited, together with the premises, machinery, negatives, and their process for the production of photographs in nature's colours.

PHOTOGRAPHS OF CORSICA.—The series of views in and around Ajaccio, recently taken by Mr. A. L. Henderson, are now being published, and prints, enlargements, and lantern slides from the original negatives (which include all the principal views, churches, hotels, characteristic studies, street scenes, and objects of Napoleonic interest) can be obtained of the Brighton Photographic Company, Clarence-square, Brighton.

THE CLIMAX ALBUMENISED PAPERS.—Messrs. John J. Griffin & Sons, Limited, of 20-26, Sardinia-street, Lincoln's Inn-fields, W.C., inform us that they have taken over the sensitised-paper business carried on by Mr. J. D. Mucklow, at 2, Turtle-road, N., and have been able, by comparing methods of manufacture, to produce a paper practically free from defect, and combining the qualities most desirable in sensitised paper—softness and depth, with entire absence of meanness.

KNOWLEDGE.—*Process Work* for June gives the following piece of sound advice on the subject of knowledge in business: "It is a fallacy to suppose that money can make up for lack of knowledge of a business, because you can afford to hire the knowledge at so much per hour, per day, or per week. You must have knowledge yourself before you can employ profitably the knowledge of others. The hugely successful businesses of to-day are nearly all run by men who have been 'through the mill' and have an intimate knowledge of the working of every department. The heads of some of the great businesses may not seem to exert much influence, and may have almost retired from the concern; but, if we inquire into its past history, we invariably find that the man who runs it took an active part until he perfected his organization to such an extent that he was able to draw himself away from his drudgery. Instead of doing the work himself he trained up young men, or got in specialists and was able to tell them what he wanted, thus gradually making a head for every department. The employer's duty thus became simply the control of so many heads of departments, and, as the business grew larger, even this could be lightened by placing 'heads' over 'heads' like the successive officers of a ship or an army. Thus the demand is keen in all businesses for men with knowledge, that is to say, a knowledge above the common ruck of things. The constant cry of employers is for men with their 'heads screwed on the right way.' Everybody knows what that means, and every one who has anything to do with running a business knows how difficult it is to get them. Nature does not seem liberal in the production of such men or our social or educational system is at fault. Boys are turned out of school thoroughly unfitted for the battle of life, because they have not been taught to think and act quickly. What is the remedy? We fear there is none. We must abide by the law of the 'survival of the fittest,' and trust to the incentive of ambition for advancement to produce more and more of the right sort of men. As foreign competition makes the demand keener for good

men, we may take it that the incentives will become greater, and the standard of intelligence will rise higher and higher; but it will be a slow process, and meanwhile foreign nations, with their soberer, steadier, more industrious, and highly educated workmen will be forging ahead and ousting us from the commercial marts of the world. Well, it will be our own fault if we lose ground in the commercial race of nations. No nation has had greater advantages and opportunities offered than ours, and no nation has so slowly grasped them. We can only lament the fact and give a word of advice to those who will take it. All who would succeed in life must learn the value of perception and observation, and the importance of observing and thinking for themselves, opposing strenuously blind belief in authorities of any kind. They must rely on their own labour and research, yet not be ashamed to ask concerning that which they do not know. Those who possess knowledge find it a pleasure to impart it to those who are really willing to learn. We must all utilise more the knowledge we possess. Men should think more, read more, and question more; but, as regards reading, we must remember that it is valueless unless we pause and reflect on what we read. Acquaintance without real knowledge is too common a characteristic of to-day. There are plenty of men whose knowledge is a versatile as a volume of *Tit-Bits*, but what is wanted in the serious battle of business life is the man whose knowledge is thorough on some one subject. There is no harm in knowing a bit of everything, but we must know one thing well, and that must be the business we depend on for our bread and butter. To sum up we would say: Learn your business in its entirety, understand thoroughly all the details, watch its operations, improve where you can, never resting content to do the same as others, always striving to do better."

Patent News.

THE following applications for Patents were made between June 25 and June 30, 1900:—

ANIMATED PHOTOGRAPHY.—No. 11,575. "Improvements in Mechanism for Taking a Series of Photographs upon a Sensitised Band of Film and for Projecting the Same." W. HOCKLEY.

ROCKER.—No. 11,723. "The Automatic Rocker and Washer for Washing and Rocking in Photographic and similar Processes." H. HUGGINS.

ANIMATED PHOTOGRAPHY.—No. 11,745. "Improvements in the Fixing and Guiding of Pictures in Kinetoscopes." Complete specification. P. WOLFF.

"**PHOTOGRAPHY.**"—No. 11,746. "Improvements in Photography." F. BOISSONNAS.

SHUTTERS.—No. 11,786. "Improvements in Everset Photographic Disc Shutters." J. E. THORNTON.

STAND.—No. 11,867. "New and Portable Stand for Photographic Cameras." S. E. PARKER.

RELIEF PHOTOGRAPHY.—No. 11,873. "A Process and Apparatus for the Production and Representation of Objects in Relief or Intaglio by the Aid of Photography." Communicated by K. Kutzbach and H. Burkert. A. J. BOULT.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
15.....	South London	{ Irish Excursion to Co. Fermanagh and Sligo. Leader, H. Esler.
16.....	South London	{ Beginners' Difficulties F. Goddard.
17.....	Gospel Oak	{ Short Papers by Beginners: Prize awarded for best.
17.....	Hackney	{ Thornton Film. W. D. Welford.
20.....	Birmingham Photo. Society	{ Excursion: Tewkesbury, Gloucester, and the River Severn. Leader, C. S. Baynton.
21.....	Ashton-under-Lyne.....	{ Excursion: Bolton Abbey and Woods. Leader, Charles Lord.
21.....	Croydon Camera Club	{ Excursion: Limpsfield to Edenbridge.
21.....	South London	{ Excursion: Ashstead, Surrey. Leader, H. E. Beckett.
21.....	West London.....	{ Excursion: Burnham Beeches.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 5.—Mr. S. Herbert Fry in the chair.

Mr. PHILIP EVERITT said a question was put to him at a recent meeting as to the new Unar lens, which two of the members, if he recollects rightly, contended had a close resemblance in construction to the Cooke lens, of which they considered it to be as close a copy as was permissible under patent law. Mr. Everitt took exception to this opinion at the time. He had now bought one of the Unar lenses for examination, thinking that those interested in photography professionally would like to see it and gain an idea of its capabilities. The lens shown was one of eight-and-a-quarter-inches focus, listed to cover, at its full aperture of *f*-5, a plate measuring $6\frac{1}{2} \times 4\frac{1}{2}$. Two photographs were shown, taken at full aperture; but, as they were on $7\frac{1}{2} \times 5$ plates, a corresponding allowance would have to be made. The qualities claimed for the lens were flatness of field, great rapidity, and extensive covering power. The lens was of the same rank as the Petzval portrait lens for rapidity, but with a much larger angle and more even illumination throughout the field. He had only just received the lens, so that his practical experiments were limited to the two negatives shown. One of these was to indicate the possibilities of the lens for portraiture at full aperture. The quality of the definition he considered very fine. The second plate was of a drawing-room

window, showing blinds, curtains, &c., all of which was faithfully rendered to the edges. Mr. Everitt thought a lens with the qualities claimed for this was especially valuable to the professional man. It was a portrait lens, a group lens, and a lens for practically every purpose. Each half was composed of two lenses with an air space, yet no disturbing reflections arose—a great achievement in an instrument of this kind. At present there was nothing published about the constructional details of the lens. A cursory examination showed that the back half of the lens was about seven inches focus, and was uncorrected chromatically. The burden of correction for colour was thus thrown on the entire combination, and the two halves could not be separately used. The back lens, however, was corrected for astigmatism. It would be seen that the lens was of a very different type from the description given to it at the previous meeting to which reference had been made. In the Cooke lens the burden of correction was thrown upon the central lens, which was nearly equal in focus to the combined focus. The lens was shown upon a camera erected in the meeting-room. In response to a remark by the Chairman, Mr. Everitt repeated that the chief claim made for the Unar was "rapidity." As to the suggestion that, granted greater rapidity, its other powers were not superior to those of Zeiss or Goerz lenses at f-7 or thereabouts, he did not think that any other factor need be considered. It might not be superior in defining power to the other Zeiss lenses, and, as a matter of fact, it covered a less wide angle than some of them. The advantage it had was its rapidity. Again, in some of the modern lenses one found reflections, but not so with the Unar. A lens was always a compromise. Certain types have special advantages over others. For specially rapid work he should choose the Unar rather than the stigmatic. If he wanted a lens that could be divided up and used for a number of purposes, and extreme rapidity was less important, then he would prefer the stigmatic. In reality the Unar was perfection at a large aperture.

Some discussion ensued on this matter and that of celluloid films.

FORTHCOMING EXHIBITIONS.

1900.

- July 13, 14 Photographic Convention of the United Kingdom (Newcastle-on-Tyne Meeting). Hon. Secretary and Treasurer, F. A. Bridge, East Lodge, Dalston-lane, London, N.E.
- August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
- Sept. 21-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- November 12-17 Ashton-under-Lyne.
- " 21-23 Hackney Photographic Society.
- 1901.
- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

- ** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
- ** We do not undertake responsibility for the opinions expressed by our correspondents.

COATING MACHINERY FOR P.O.P.

To the EDITORS.

GENTLEMEN,—I notice in the last issue of the JOURNAL an inquiry by "P.O.P." re "Coating Machinery for P.O.P." and your reply referred him to Flimsch & Co., of Offenbach a/M. I beg to point out that there is no necessity for going about for machinery of that kind, as Messrs. Masson, Scott, & Co., Limited, engineers, of York-place, Wandsworth, S.W., are makers of all kinds of paper-coating, printing, printing ink, and paper-making machinery, and have, to the best of my knowledge, made and supplied paper-coating machines to the Britannia Company, Limited, Ilford; Messrs. Berger & Co., Hampstead; Cadett & Neall, Ashtead, and other firms in this country.—I am, yours, &c.,
92, St. John's-hill, London, S.W.

E. FENSKE.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:

- H. Barrett, Spondon, Derby.—Photograph entitled "The Village Blacksmith."
- J. Norval, 123, New-road, Dunfermline.—Two photographs of survivors of the "Thin Red Line."

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

SMOKE IN FLASHLIGHT PHOTOGRAPHY.—FLASHLIGHT asks: "Could you kindly suggest the best way to avoid smoke in making flashlight photographs?"—The only way is to either conduct the smoke into the open air, as in Salmon's and similar apparatus, or to trap it, as in Weiss's or contrivances of a similar type. There is no way of avoiding the flashlight yielding smoke.

BOOK ON PHOTOGRAPHY.—A. CARROLL says: "I want to know if there is a good book on all-round photography, one that would give professional work to suit one in the trade. If so, would you kindly let me know where to get it, and the price?"—There are several books published for the assistance of amateurs and beginners, but we know of none for professional photographers. They are supposed to know their work before they commence business, therefore such a work would be useless to them.

NAME OF BOOK ; PLATINOTYPE PRINTING.—PLATINO asks: "(1) The name of a book on the business of photography, giving details of the keeping of books, negatives, &c.? (2) what platinotype paper and developer to use to get pure velvety-black colour?"—1. Write to Messrs. Dawbarn & Ward, Farringdon-avenue, E.C. 2. Ordinary commercial platinotype paper. Use the formulae supplied with the paper, and you need have no difficulty in getting rich blacks. Of course, some little practice and skill are required to get uniformly the best results. These are not always obtained in the first attempts.

RECOVERING GOLD RESIDUES.—W. THOMPSON writes: "I wish to recover the gold from old toning baths, and should esteem it a favour if you would let me know if I am on the right track to do so. I have put a little sulphate of iron into a bottle, and have put in the solution when I have finished toning. I leave it in the bottle for about two days, then pour off and fill up again. If this will not deposit the gold, what would you recommend, and how to use it?"—The best way is to put the old toning baths into a bottle, and, when it is nearly full, add a solution of sulphate of iron, acidified with sulphuric acid, and then well shake the bottle. The gold will then be precipitated.

IDENTITY OF A PICTURE.—F. YATES writes: "I should be much obliged if you could give me some information about a picture I have hanging up here. The subject is the Madonna of Raffaelle in the Dresden Gallery. In left-hand corner is 'Kerblarum Art' (or Herblarum); in right-hand corner is 'F. Muller Sculpt.' I believe it is a photograph, though it might almost be taken for an engraving. I shall be grateful for any light you can throw on the matter."—Without seeing the picture we can offer no opinion. It may be an engraving or a photographic reproduction from one. The Dresden Madonna has been reproduced in so many ways and by so many methods that it is impossible for us to say whether the one in question is an original engraving or photographic copy.

PHOTOGRAPHING PLASTER CASTS.—AJAX asks: "1. When photographing a white plaster cast that has figures in slight relief, and using side light, is it necessary to cut off top light? I find that using side light only I do not get the whole surface equally lighted. The part of the cast furthest from the light does not develop as dense as that part nearer the light. I put the cast at the back of a deep box, painted black inside, from which one side and most of the front had been removed. 2. I noticed in your Answers column, a few weeks ago, that some one else had taken the pseudonym of 'Ajax.' I do not know that this can be prevented, but it seems likely to cause confusion."—1. It is clear that the cast was not evenly illuminated, hence it would necessarily not have even density all over. No set rules can be laid down as to how different subjects are to be lighted, it is simply a matter of judgment on the part of the operator. Why put the cast in a box at all to copy it? 2. Correspondents who do not wish their answers to appear under their own name can, of course, adopt any pseudonym they choose, the same as our correspondent has done.

COPYRIGHT QUERIES.—SIMILE asks: "1. Has an employé need to concern himself about the question of copyright when he is told to make a copy of a work of art, either by photographing it or by painting or drawing it? and does it matter whether he is paid wages or for the job? 2. If such a work of art turned out to be copyright, would the blame fall upon him, or his master, or both? 3. In the case where two or three took a part in the work of copying, would they all be responsible? 4. Supposing the job consisted in a sort of composition or compilation of several pictures, as, for instance, a head from one, a figure from another, an accessory from a third, with perhaps a background and colouring from imagination, so that the result as a whole would appear to be something new, yet, if the proprietors of copyrights discovered bits of their own in it, could they all come down on the artist, still supposing that he is working under his employer's direction?"—These queries seem framed with a view to evading the Copyright Act. 1. If the employé was aware that the work was copyright, he would know that he was infringing the law. 2. Probably both. 3. This would look very much like a conspiracy to evade the law. 4. Probably the owners of the copyrights could proceed against all that were concerned in the transaction, but we decline to give a definite opinion.

** Our notes on the Newcastle Convention will appear in the JOURNAL of next week.

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EX CATHEDRÀ.

As a supplement to this number of the JOURNAL we give a phototypic reproduction of the group of members of the Photographic Convention of the United Kingdom, taken at Jesmond Dene on Wednesday afternoon, July 11, 1900. The negative was made by Mr. W. Parry, the well-known photographer of South Shields. This is the fifteenth Convention group that has been taken, and it is the general opinion that it compares very favourably indeed with the best of those produced at former meetings of the Convention. A beautiful natural background assisted Mr. Parry to secure an effective piece of grouping. The original photograph is 15 x 12 inches, and, the negative being of very good quality, rich prints on surface paper are the result. Copies of the picture may be obtained of Mr. Parry at the address above mentioned. There are 112 figures in the group, and next week we shall give a key of names.

* * *

A FREQUENT contributor to our columns, Mr. J. A. Reid, of Cutliffe-grove, Bedford, is issuing a shilling book, entitled,

The Environs of Bedford. It illustrates points of interest in the county, and supplies a map. The guide is arranged in sections suitable for "day tours" in all directions, taking the tourist along the best roads, prettiest scenery, through quaint and typical English villages and places of special interest, and past the famous residences of Bedfordshire notabilities. The author tells us that he has undertaken every one of the tours personally, and he hopes that his production will prove of utility and interest to the always increasing number of cyclists desirous of enjoying a pleasant day's spin in the country. The routes will be found suitable and convenient for drives, rides, or walks, and they can be curtailed or extended at the will of the tourist. Photographers as well as cyclists will find Mr. Reid's book worth adding to their collection of local guides. Bedfordshire, photographically speaking, has been somewhat neglected by those who tour with the camera, but it has many quiet and beautiful spots where, though comparatively near London, the photographer can follow his hobby far enough from the madding crowd to secure immunity from interruption.

* * *

THIS week the marvellously fertile publishing house of George Newnes, Limited, adds a new periodical to its long and successful list of publications. It is called the *Traveller*, and, at the price of sixpence, is issued weekly. Photo-typically illustrated articles, interesting alike to travellers and "stay-at-homes," fill its pages; and it is superfluous to add that in style and get-up the new-comer is faultless. The prospectus tells us that the business of modern travel has assumed such enormous proportions that it is remarkable no high-class weekly journal has yet been published to reflect and represent this important phase of life. The *Traveller* is designed to be such an organ—a high-class weekly journal, abundantly illustrated, and devoted to the great business of holiday travel and tours, both at home and abroad, for health, sport, and pleasure. The journal will be so arranged as to appeal to all classes at all seasons. The plan of campaign has been very widely laid down, and it includes a page for the amateur and his camera. Mr. A. Kemp, an old photographic friend, is associated with the management of the *Traveller*, to which we wish the utmost success.

WHO does not know the name of Charles Reid, of Wishaw in connexion with the photography of birds and animals? For many years past he has had a very great reputation for these by no means easy kinds of work. His latest catalogue lies before us. It contains some exquisitely dainty reproductions of negatives of blue tits, sheep, Shetland ponies, cattle, dogs, poultry, swans, sporting dogs at work, &c., all showing mastery of selection, and skill in photographing a subject happily and characteristically. Of his very large collection Mr. Reid tells us that it numbers several thousand subjects, to which additions are constantly being made. The portraits of typical animals of the different breeds form but a very small portion of this collection; and, while care and judgment have been exercised in endeavouring to show individual animals to advantage, by far the greater part of the photographs have been taken with a view to the obtaining of pictures rather than of portraits. Lovers of the bird and animal kingdoms should possess this catalogue. It will serve to briefly introduce them to one of the largest and most varied collections of photographs from nature that exists in the United Kingdom.

* * *

THE prolific novelist, Mr. S. R. Crockett, has written a little book published by Messrs. Newman & Guardia, of Shaftesbury-avenue, W.C., in which he tells us why, in the compilation of sketches and memoranda for his novels, he was led to substitute the camera for the pen and the pencil. He yearned for some method more complete, certain, and permanent of recording and filing his impressions. "So, in a moment of inspiration, it chanced that I strolled into a railway terminus. I stood a moment undecided at the bookstall, and then demanded a copy of *Nature*. The brisk young gentleman behind the counter offered me a choice between *Tit-Bits* and THE BRITISH JOURNAL OF PHOTOGRAPHY. Being at the moment frivolously inclined, I chose the latter, and, lo! on the second page I saw for the first time the mystic letters 'N. & G.' It was a modest advertisement, drawn up with the lack of enthusiasm of a builder's specification." Our author has many agreeable things to say of the fine "N. & G." cameras which are perfectly well deserved, and his book is written all through in an amusing style. We hope his frivolous mood has not passed off, and that he remains a constant reader of the JOURNAL, to which he owes his introduction to the camera of which he thinks so highly. When frivolity next attacks us, we will buy one of Mr. Crockett's novels, and trust a perusal of it will profit us as much as a glance at our pages appears to have done the celebrated writer of *The Raiders*, *The Lilac Sun Bonnet*, and other charming books.

LEAKY ROOFS—THEIR REPAIR AND PRESERVATION.

A CORRESPONDENT was replied to in the Answers column last week on a subject that has always been a source of trouble to professional portraitists, namely, the making and keeping of the studio in a water-tight condition. The querist said, "I find the usual way of putting and painting lasts only a little while, and then lets the rain in." Now, nothing conduces so much to an unsightly appearance in the interior of a studio as a leaky roof and its concomitants, stained and discoloured blinds and curtains. Much time and money are frequently expended in remedying the evil, but it is often found that, after a very brief period, the state of affairs becomes very much as

before, and this seems to be the substance of the complaint of the correspondent who wrote us.

This subject has more than once been dealt with in these pages, and the reason why we again refer to it is because now, or will be shortly, is the best season of the year to deal with the trouble, as the necessary work can be the better done when the woodwork is dry and shrunken with the hot weather than when it is in a moist and expanded state, as it will be after the wet season has set in.

One of the most fertile sources of leaky studio roofs is the lack of stability in the sash bars themselves, so that they give under the pressure of a heavy wind, thus causing the putty, after it has become hard and lost its elasticity, to crack and separate from the glass, or from the wood or iron, as the case may be. Wood, iron, and even glass will yield, but *hard* and *dry* putty will not—that breaks. Too often, particularly in the case of the more ancient studios, which were built with the view of admitting the greatest possible amount of light, the sash bars—both roof and sides—were unnecessarily slight; so indeed they are in some modern ones. Where that is the case, it may happen that repairing will, instead of mending matters, make them, after a time, worse rather than better, because the weight of the painter on the roof may cause the bars to bend sufficiently to separate the hardened putty from the glass on the under side. This will not be manifest to the eye, and the applied paint on the outside will not remedy the injury caused, hence the water will eventually find its way through.

The first thing to be done in rendering a roof sound and lasting is to make the sash bars absolutely rigid and unyielding. This is best done by affixing, laterally, on the inside, two or more, according to the length of the sash bars, bars of tee (T) iron. As this form of bar has great strength and rigidity, it need be but small, hence it will stop off but little light. That being done, all the old putty that has become hard and cracked, or loose, should be "hacked" out and thoroughly cleared away. Next a coat of thin paint should be given. The paint should be so thin that it will run, or penetrate, between the glass and putty on the under side if that has separated from the glass. Then a second coat should be applied after that has dried. After this has become dry, the new putty, which should be made of the best linseed oil, whiting, and a little white lead, must be put on with good pressure, so that it is forced well between the glass and the bars. Finally, after the work has stood for a few days for the putty to harden somewhat on the surface, a couple of coats of tolerably thick paint, made with the best white lead and linseed oil, with a minimum of dryers, should be given. A comparatively slow-drying paint is better than a quick-drying one for this purpose. In this way a sound roof will be obtained. We may here give a practical hint: it is that it is not always advisable to have the work done by "contract," as then the requisite time, and quality of material, is not always expended upon it so as to ensure a durable result.

A sound roof having been obtained, the next consideration is the best means of preserving it in that state. The best way to do that is to, every six months or so—say spring and autumn—lay on a fresh coat of good paint, even if the work does not seem to require it for the time being. If this were periodically done, we should hear less of leaky roofs than we do. A photographer we knew, always towards the end of the summer, made it a practice to have a coat of thin tar, to which a little tallow had been added, applied warm, or while

the sun was upon it, to the outside of the sash bars of the studio as a means of keeping the roof water-tight, and this it did effectually.

Some weeks ago we reproduced, from the *Camera Obscura*, a formula for a cement to take the place of putty for studio roofs that looks well in theory. It stands thus: Tear ordinary newspaper into small pieces, place in an enamelled vessel, and cover it with caustic potash lees; boil it, and add, with constant stirring, one-third the quantity of turpentine; thoroughly mix, and keep the solution hot; then add the following ingredients, which must also be dissolved in boiling turpentine: ordinary pitch, 10 parts; resin, 3 parts; gutta percha, 10 parts; wood tar, $2\frac{1}{2}$ parts. The solution should be well stirred, and boiled until it becomes a thick paste, and then it should be used while still warm. It is scarcely necessary to tell our readers that this composition is highly inflammable, and therefore its preparation should be conducted out of doors. The claim made for this composition is that, being somewhat elastic, it gives with the unequal expansion and contraction of the glass and the sash bars.

We have said that this formula reads very good in theory, but we cannot say how it would answer in practice. We should ourselves rather adhere to the old and well-tried putty system, with an occasional coat of paint, taking, of course, the precaution that the sash bars are made sufficiently rigid, in the first instance, to withstand the pressure of the strongest gales without their yielding. Without that condition we consider that nothing will render a studio lastingly water-tight.

A Copyright Case.—A decision was given in the Chancery Court one day last week that is of considerable interest to photographers, although photography was not directly concerned in the case. Briefly, the case was this: The plaintiffs issued a catalogue containing a dozen illustrations, with price-lists attached. Another firm were desirous of using the same blocks for their catalogue, and the plaintiffs declined to lend them, but agreed to sell electros of them, which they did. These electros were handed to a firm of printers, who agreed to do the printing at a special price, on the understanding that they could use the electros for other catalogues, a permission that the purchasers of the blocks, as they had bought them, thought they had the right to give. The plaintiffs contended that, as they had sold the electros for a specific purpose—to be used for the purchaser's catalogue—they should be used for no other, and therefore sought an injunction to restrain. In this they were successful, Mr. Justice Byrne, in a reserved judgment, ruling that, as the electros were sold for a specified catalogue, they could not be used for any other, and he therefore granted an injunction, with costs of both the action and the interlocutory motion. This case is specially interesting to photographers, as showing that when they sell the right to use their copyright photographs, say to an illustrated paper, the purchasers have no right to use the blocks for any other, and they can be restrained by law from doing so. In the forms supplied by the Photographic Copyright Union, copies of which are printed in the ALMANAC, there is an express stipulation that the permission is given "for one issue only, and the subject may not be reproduced or sold as an independent illustration separate from the above publication and its accompanying letterpress. If any other use is desired, a fresh permission and payment is required." Our readers, when they sell the right to reproduce their pictures, would do well to formally make this stipulation, notwithstanding the decision in the case above referred to. Litigation is costly, and it should always be avoided when possible.

Phosphoric Fumes.—In our Foreign News and Notes, last week, were given the results of experiments by Dr. R. E. Liesegang

with the fumes of phosphorous on photographic silver papers, and plates. The Doctor finds that P.O.P. exposed to the fumes given off from non-safety phosphorus matches reduces the silver on the surface in a couple of hours, and produces a strong colouration with a metallic lustre. The knowledge of the reduction of silver from its salts to the metallic state by the fumes of phosphorus is by no means novel; indeed, it was one of the old methods of obtaining a conducting surface, in electrotyping, on objects that were too delicate to stand black-leading. The method was this: The article was brushed over with a solution of nitrate of silver, and then exposed to the fumes of phosphorus, obtained from the evaporation of either an alcoholic or ethereal solution, where a deposit of finely divided metal took place, forming a good conducting surface. A salt of gold or platinum may also be used in place of the silver salt, though that was the one usually employed. The method of obtaining a conducting surface by the reduction of silver by the vapours of phosphorus is given in the third edition of Smee's *Elements of Electro-metallurgy*, published in 1851. Hence it will be seen that this property of phosphoric fumes in reducing silver to the metallic state is not altogether a new discovery.

Objectionable Photography.—Photography, we are sorry to say, is often followed in an objectionable manner. We read that Governor Roosevelt, candidate for the Vice-Presidency of America, has been greatly annoyed by the action of a couple of photographers who took "snap-shots of him while he was bathing in Oyster Bay." The thought that he must go on record, possibly in public print, as he appears shorn of rough-rider hat or glasses, in an ordinary bathing suit, has, it is said, raised his anger to white heat; and no wonder. The publication of such photographs would be very annoying to any one, even were he not a candidate for the Vice-Presidency of America. Why we allude to this here is that we have recently heard, as we frequently have before, of the offensive behaviour of some amateur photographers with hand cameras at seaside places in hovering about the ladies' bathing places to "snap-shot" them as they leave, or return to, their bathing machine. Such conduct is highly reprehensible, and tends to bring photography into contempt, because ladies, of course, have a very strong objection to being photographed, surreptitiously, when they are in a state of *deshabille*, as they necessarily are when enjoying the morning dip, and with the possibility that the photograph may eventually be shown on the screen to the amusement of scores of people. Some ladies, just returned from the seaside, remarked, in our presence, that the pleasure of bathing was much marred by two or three "snobs" besetting the ladies' bathing place with their hand cameras every morning. Such conduct is not only discreditable, it is really disgraceful; but, unfortunately, there is, at present, no law to prevent it.

Value of Engravings.—During last week Messrs. Sotheby conducted several sales of engravings that, on the whole, brought good prices. For example, a portrait of Miss Palmer, after Reynolds, engraved by J. R. Smith, realised 90*l*. *Rural Amusement*, after G. Morland, engraved by Smith, printed in colours, fetched 61*l*. A damaged engraving, after Raffaello, *The Massacre of the Innocents*, which had been skilfully repaired, went for ten guineas. Many others realised from twenty to forty pounds a piece. Although these high prices are sometimes realised at auction sales, it should be borne in mind that they are only given for exceptionally fine proof impressions, of which there are only a very limited few taken from each plate. Therefore these prices may be looked upon as fancy ones, and must not be taken as a criterion as to what ordinary prints from the same plates may be worth. It may sometimes happen that a fine proof impression will realise as many pounds as some prints from the same plate, after it has been well worn, are worth pence.

War Portraits.—The number of portraits of generals and prominent officers now serving at the front, to be worn as buttons or badges on the dresses of their admirers, must be reckoned by millions. Almost everybody one met a little time ago was wearing one or several as a mark of loyalty. The majority of these portraits

were photographs, and, of course, very little time or care was bestowed on their production, and, as a matter of course, they are not proving very stable. During the past few weeks we have noticed many being worn that have become, by the continued exposure to light, in a very woe-begone state. A few days ago we were travelling in a train, and a lady opposite us had two portraits of generals on her dress, but the images were almost obliterated by the deep yellow colour caused by imperfect fixation. What more could be expected for the price at which these pictures are produced, considering that they carry two or three, sometimes more, profits before they are sold complete, retail, from a penny to twopence each? Yet, unfortunately, they tend still more to confirm the general idea of the majority of the public that "all photographs fade."

NEWCASTLE CONVENTION NOTES.

I.

LIKE many of its predecessors, the Fifteenth Convention at Newcastle-on-Tyne opened in tears and closed in smiles and sunshine. Two hours before the Mayor, Sir Riley Lord, with a humorous apology for the absence of his chain of office, took the chair at the opening ceremony, and made one of those direct, cordial little speeches of welcome which the Convention was to hear repeated by so many of its Northumbrian hosts during the week—two hours before the Mayor reflected the first ray of official sunshine upon the proceedings, Newcastle was indeed a city of dreadful night to the newly arrived Conventioner. A dank mist hung over the river, rain fell heavily, and a moist November day seemed to have stolen out of the calendar and surlily intruded itself upon the strawberry-laden kingdom of the month of July—a chimneysweep had darted into the rose-scented boudoir of a dainty lady. Despair shone in many a face. A wet week in Northumberland was a refinement of torture and disappointment which would hit the fine-weather-loving Conventioner hardest of all.

II.

But the cheery phrases in which the Mayor extended Newcastle's welcome to the Convention helped to raise their spirits. Sir Riley Lord spoke enthusiastically of the historic interest and natural beauties of Northumbria, and, as members listened to him, their hopes of a bright morrow also rose; and when Tuesday came the sun had replaced the mist and the rain, and the rural Tyne gleamed between its delicately greened banks as the large party were leisurely conveyed by the North-Eastern Railway Company to Hexham. June had lent one of her choicest days to her sister month! The Hexham excursion was a great personal triumph for Mr. Pattison Gibson, whose hard work on that occasion will never be forgotten by those who profited by it. In the early part of the day he led the party over the old abbey, the principal features of which he painstakingly and minutely described. The light was very good, and a considerable amount of interior work was attempted by the members. In the afternoon a drive of some miles took the Convention to the Roman Camp at Walwick Chesters, the Great Wall again giving Mr. Gibson the opportunity of convincing his hearers that he has the history and legend of this deeply interesting part of Northumberland at his finger tips.

But there was a third delight in store for a large party of the Conventioners, who were chosen by lot to drive to Haughton Castle, the border home of Mr. W. D. Cruddas, M.P. for Newcastle. The kindly host paid the Convention the exceptionally high and much-appreciated compliment of travelling specially down from London in order to be present at the reception. Mr. Cruddas and the ladies of his family entertained the visitors at afternoon tea, and every opportunity was given for taking exterior photographs of the Castle. Hexham was again reached by brake as the sun was setting, and the party arrived at Newcastle at a quarter to ten, charmed with an excursion which had afforded them exceptionally fine opportunities for photographing buildings and remains of historical interest and world-renowned picturesqueness. The indefatigability of Mr. Pattison Gibson, and the kindness of Mr. Cruddas in throwing open his "border home," added a touch of gratefulness to one of the most successful Convention Tuesdays yet experienced.

III.

The sun still shone on Wednesday, the day on which the principal business of a Convention has to be transacted. The General Meeting

elected the House list of members of Council for 1900-1901, as printed in these pages on June 22nd last, and the Local Committee were thanked for their labours, the name of Mr. Edgar G. Lee (Local Hon. Secretary) being warmly coupled with the vote. Expression was also given to a sincere regret that illness had prevented Mr. W. Thompson (the joint Hon. Sec.), who had been working hard for the Convention for months past, from participating in the fruits of his labours. A vote of thanks of an especially hearty character was passed to Mr. F. A. Bridge (the General Hon. Secretary and Treasurer), and, with the selection of Oxford as the meeting place of the Convention for the year 1901, general business was brought to a close. At the Council meeting which followed Sir William Herschel was unanimously chosen as President of the Convention for 1901-1902. The morning business was over very shortly after eleven, and members hastened away to take advantage of the sunshine. There was a dread—an apprehension—that it might go at any moment, but it stayed with them all the week.

In the afternoon Mr. Bainbridge, the President of the Newcastle and Northern Counties Photographic Association, "took the field," if the expression may be allowed. He held a reception of members of the Convention at Jesmond Dene, a paradise for stereoscopic photographers. Here, amid the trees and the undulating walks by the rocky stream, members strolled and photographed for an hour, and then came the solemn ceremony of the group. Later in the afternoon the Banqueting Hall was the scene of Mr. Bainbridge's hospitality, and yet again one was reminded that the Photographic Convention usually fixes its meeting at a time when strawberries are at their very best. The afternoon passed away to the perfect satisfaction of every member of the Convention.

IV.

The sweet and plaintive Northumbrian pipes, with the haunting little melody, "Take a peep at Peggy's foot," were a feature of the dinner, which was a pleasant and successful function. In responding to the toast of the Newcastle and Northern Counties' Photographic Association, Mr. Bainbridge, the President, spoke of the pleasure it had given them to welcome the Convention to the North, and said that, when it was Newcastle's turn to be again visited, an even better programme would be better prepared for their entertainment.

The following was the list of toasts: "The Queen and Royal Family;" "The Photographic Convention of the United Kingdom," proposed by the President and responded to by Mr. Bridge; "The Newcastle and Northern Counties' Photographic Association," proposed by Mr. Bridge and responded to by Mr. Bainbridge; "The President," proposed by Mr. C. H. Bothamley; "The Ladies."

Telegrams and letters of regret from the following members, who were prevented by illness and other causes from being present at Newcastle, were read: Messrs. H. P. Robinson (Past President), Ralph Robinson, Harold Baker, Fred W. Hindley, Thomas R. Dallmeyer (President of the Royal Photographic Society), Colonel J. D. Lysaght (who cabled specially from Capetown), Messrs. C. G. Emery; H. Vivian Hyde, Hedley M. Smith, Dr. P. H. Emerson; Mr. James Gribble (Paarl, South Africa), &c., while many verbal messages of a similar tenour were conveyed to principal officers.

V.

The lantern arrangements in the hands of the Rev. J. W. Ogden and Mr. Milburn, of Sunderland (colour), were exceptionally well carried out, and the show of pictures on the screen on the Monday, Thursday, and Friday included some of the best slides recently produced. Amongst the contributors were the following:

Graystone Bird, Bath,	Ernest Marrage, South Woodford,
H. C. Leat, Bristol,	Mrs. Annie E. Blake, Bedford,
Harry Wade, Manchester,	Mrs. Welford, London,
John Gunston, London,	A. Brooker, Hastings,
R. R. Rawkins, London,	A. T. Crane, London,
E. R. Bull, London,	A. E. Smith, Kingston,
Alex. Henderson, London,	H. G. Frost, Deal,
Wm. A. Fraser, New York,	Alfred Rogers, Stretford.

This collection was arranged for by Mr. W. D. Welford.

Amongst local workers, Messrs. Bainbridge (President), J. Pattison Gibson, W. S. Corder, Edgar G. Lee, and W. Parry were especially prominent in delighting those present at the meetings, which were exceptionally well attended, considering the fact that the Grand Hotel Assembly Rooms are situated a considerable distance from the centre of the town. On the Friday evening Mr. Watson showed an amusing cinematographic view of the members of the Gloucester Convention,

ch had been specially brought for the purpose by Mr. W. Crooke, the sident on that occasion. Mr. E. J. Wall superintended the display of es by the Joly, Ives, and Sanger Shepherd superposition process, the er being very much admired. Every one connected with the optical tern arrangements at Newcastle deserves to be congratulated. We e seldom seen better slides better shown.

VI.

Sunshine again on Thursday, when Major White and Mr. Robert uxwell led the Conventioners over Durham Cathedral and Castle. thin the space of a few lines "we are not equal" to describing the ries of those grand old piles; let us, then, take refuge in the remark t a perfect wealth of possibilities in architectural photography was ed at the disposal of Conventioners. The classic view across the er (it must be nearly twenty years since we saw McLeish's *Misty rning on the Wear* on the walls at Pall Mall—what, we wonder, has some of its producer?) attracted the attention of many a lens, and in afternoon Finchale Priory drew a small party away from the oppre- heat of the old city.

But who of those present will forget the charm of taking lunch in the eat Hall of the Castle (or University), one of the finest of the kind in kingdom? The portraits of dead and gone Masters of the University ked down from the walls, it seemed, in dignified approval when the nks of the Convention were conveyed to Dr. Plummer, the present ster, for the great privileges he had placed at the disposal of members. Major White (the President of the Durham Camera Club) and Mr. Gray e Deputy Mayor) also acknowledged the thanks that were tendered to m. After the pleasant meal in this historic and academic hall, away more camera work in the Cathedral and the Castle. Then, at the se of the afternoon, home to Newcastle to the serious business of pers and lantern slides.

The papers that were read at the Convention will be found at the end these notes. Sir Benjamin Stone, M.P., was detained in London by s political duties, and Mr. Scamell (Hon. Secretary of the National otographic Record Association) kindly deputised for him. The Hon. Secretary read the papers by Mr. E. Howard Farmer and Dr. Emerson, d Mr. Webber supplemented his brief paper by a practical demonstra- on of blow-pipe work with some of the precious metals. All four ntlemen who contributed papers were cordially thanked by the ettings.

VII.

"All aboard! All aboard!" cried the leader of Friday's excursion, hen the brakes had conveyed Conventioners a few miles through the agnificent natural park at Alnwick. The ungroomed wilderness of this plendifid domain, combined with the crisp fresh breeze that tempered the eat of the sun, supplied a vigorous feast of nature that came well at the end of a splendidly varied week. The party had left the brakes at a lofty emorial tower erected by a former Duke of Northumberland, when

All aboard! All aboard!" cried the leader, the Rev. Mr. Perry. Re-ellious looks were cast at him. Nobody likes to be hurried on a Convention excursion, especially in such a place as Alnwick Park. But the enial guide would not be denied. He knew better than the Conventioners what was in store for them. So "All aboard" they got, to be driven more miles through this matchless expanse of unspoilt grandeur, to be given the opportunity of photographing at the ruins of a Carmelite bby on a hill top; to be pointed out a column-crowned eminence re-sembling the real Mount Carmel, and then to be taken for still more miles through the park into the old border town of Alnwick itself, and to be "All aboard" at lunch almost to the minute of time, thanks to Mr. Perry's prompt generalship. Mr. Bainbridge, who had provided aloon carriages for the party, had induced the North-Eastern officials to pitch the Convention train on to a convenient "Scotchman," and had secured an extension of time for the party in Alnwick, was again cordially thanked for his kindness, and especially enthusiastic were the thanks given to the Rev. Mr. Perry who had proved himself such a successful eader in a splendid country. The remainder of the afternoon was chiefly passed in exploring and photographing Alnwick Castle, and when the day had ended, and the party once more sought the train, a feeling of intense satisfaction with a grand day's outing was expressed by all. At the departure from Alnwick the Rev. Mr. Perry was again heartily thanked, and when the President of the Newcastle Association, Mr. Bainbridge, detrained at Morpeth, the cheers that followed him were not only the expression of the members thanks for his week-long activity and kindnesses, but were also an indication of their delight at their days' presence in the land of the Percies.

VIII.

"One of the best Conventions yet held!" "Second only to Dublin!" "Successful all through!" were some of the criticisms passed on the Newcastle Convention. Not a discordant note was heard during the week. Perfect weather favoured the excursions, and the chances for serious photography which Hexham, Durham, and Alnwick offered were taken advantage of to the utmost by those members who were anxious to put in some good work with the camera. The local organization worked with machinelike precision, and Messrs. Bainbridge, Pattison Gibson, Edgar Lee, and their co-workers in Newcastle and the three excursion centres named, may be assured that what they did on behalf of the Convention was crowned with absolute success and caused the liveliest satisfaction to the visitors.

An exhibition of photographs was held in the meeting room, where there were also exhibits by members of the local association, the Sandell Film Company, Mr. Godfrey Hastings, the Thornton Film Company, and others. The Platinotype Company had a large series of platinotype portraits and reproductions of paintings on view, and the presence of their electrically controlled oxy-magnesium light in a specially erected studio supplied them with the opportunity of demonstrating its great utility by taking the portraits of most of the prominent members of the Convention present in Newcastle. In this manner some six dozen 12 x 10 plates were used. The evening meetings were remarkably well attended, and much real interest in the papers and demonstration was manifested. On each occasion the meeting room was well filled. The local press reported the Convention proceedings with the greatest possible fulness. In fact, from whatever aspect it is regarded, the Newcastle Convention bears the marks of splendid success. A glance at the names of those associated with it will show that it was attended by prominent representatives of all phases of modern British photography, and, if the total attendance fell slightly below that of previous meetings, the exceptional circumstances of an exceptional year provide a sufficient explanation. The meeting was, photographically, pleasant and profitable throughout, and the kindness of every individual member of the Local Executive, we are sure, will never fade from the memories of the visitors from near and far.

In writing these few Notes of the Convention, we have had, of course, to keep in mind the fact that the pen is being directed by one who had the honour of acting as the official head of the Newcastle meeting. This circumstance obviously precludes the insertion of a report which gives any degree of prominence to the name of a President who is also Editor of this JOURNAL. It is hoped that the notes, written in a mood of the utmost self-detachment, will meet the needs of readers. But the President cannot let slip the opportunity of heartily thanking the troops of friends who came to his support during the Newcastle meeting. Their splendid loyalty and comradeship will gladden him all his days.

DIARY OF A CONVENTION PRESIDENT.

SUNDAY.—Take much physical exercise. Golf in the morning; walk in the afternoon; rowing in the evening; walk after supper. Feel very fit.

Monday.—To escape crowd journey alone to meeting place. Arrive an hour before opening. Learn that Hon. Sec. and local committee have been searching for me all day. Sorry. Mayor arrives. Am installed. Wonder if I have lost presidential address. Last recollect seeing it on dressing table 300 miles away. Search in pockets. Find it at last mixed up with cloak-room ticket, bunch of keys, Mr. Watkins' table of plate speeds, and other railway literature. Much handshaking after the meeting. Asked by sixteen people whose plates I consider best. Reply that I always use films.

Tuesday.—All-day excursion. Aggrieved photographers discuss copy-right with me on outward journey. Am induced to lecture on astigmatism to crowd in Abbey. Get in the way of twenty people all photographing at once. Am liberally reviled. Smile. Lunch off cold roast lamb, salad, and the orthochromatism of ordinary plates. Resume journey in brake. Discussion: lantern slides by contact or reduction. Arrive at Castle. Am asked whose films I use. Say I have brought plates. Speech. Am photographed by twenty Conventioners. Return journey occupied in considering the hardening effects of formalin. Arrive home at 10. Delightful day. Wonder what the scenery was like. To bed at 12. Knocked up at 2.30 a.m. by Conventioner, changing plates in own bedroom, wanting to borrow sheet of ruby paper. Endeavour to be polite.

Wednesday.—Speech-making from 10 to 11.45. Short drive in town. Discussion *en route*, collodio-chloride versus gelatino-chloride. Reception in Park after lunch. Temperature in shade 92°. Silk hat and frock coat delightful wear. Asked whose lenses I consider best? Suggest the

Kew Test. By request explain it. Group taken. Nearly precipitated in water. Smile. Afternoon tea diversified by the examination of several double-toned prints, over-exposed negatives, and the changing mechanism of fourteen hand cameras. Much photographed again. Annual dinner 7 to 10.30, followed at 11.55 by examination of negatives showing dichroic fog. Discussion adjourned at one o'clock. Woke at three by Conventioner who had been making midnight exposures from the High-level Bridge and had mistaken his room. Blessed him.

Thursday.—Excursion. Discussion *en route*, the cure of distortion given by single lenses. Irreverent small boys in town call Presidential badge Victoria Cross. Resolve not to get in anybody's way in Cathedral. So go on river. Photographic discussions barred for one hour only. Lunch in University Hall. Speeches. Deputy-Mayor self-declared to be the discoverer of method of exposing plates through the backing! Announcement received with deafening applause. After lunch am asked to explain (1) U.S. system of marking stops; (2) meaning of phrase, "Gauss Points"; (3) wave-length theory of light. Friendly hands rescue me and bear me off to the quietude of a ruined priory. Home at 7.30. Papers and lantern slides from 8 to 10. Informal discussion, "Is photography an art?" from 11 to 12.30. Adjourned. Woke at two by member anxious to know if I had key that would fit his bag. Hadn't.

Friday.—Excursion. Attempt to "do" the third largest county in England in eight hours. Discussions *en route*: colour photography, stereography, and benzole derivatives. Am asked to give formula for best developer. Reply: H_2O =hydroxyl-mono-hydride, q. s., qualified according to taste and circumstances. Photograph Norman archway with crowd looking on. Shutter sticks. Crowd sniggers. Told camera wasn't level; that it had moved; that I had over-exposed, under-exposed, and not exposed at all. Smile benignly. Lunch. More speeches. Tell a story—for the first time not about parrot and dog. Everybody delighted and shakes hands with me. Castle of Five Acres! Not big enough. Still chided for getting in the way of Conventioners giving ten minutes' exposures on one-second subjects. Homeward journey devoted to taking photographs of President. Novel experience! Start dinner at 7.45. Finish at 7.59. Papers and slides 8-10.30. Discussion on things in general, 10.35. 12.30, to bed. Woke up at 2.30 by Conventioner anxious to tell me the latest good story. Saved him the trouble as politely as I could. Made an enemy of him.

Saturday.—Alive!

Sunday.—A liver!!

NATIONAL PHOTOGRAPHIC RECORDS.

[Paper read before the Photographic Convention of the United Kingdom.]
THE value of obtaining a systematic collection of permanent photographs that may prove of value to the future historian or scientific man is now so well established that it is unnecessary to dwell at any length on that point. The only questions now are: What to take, how to take it, and how and where such a collection should be stored.

With regard to the first—what to take. If in any doubt, let us consider the value a print of a similar scene or incident of the past would be to us at the present day. Our only sources of information now of the dresses and customs of the past are to be found scattered through the old manuscripts, or in such work as the Bayeux tapestry, in which we have a splendid record of the dresses, arms, armour, shipping, &c., of that age; or if we come to later date we have to refer to Hogarth, Rowlandson, or some of the old sporting prints, but in every instance we only get a record of the event as represented by the artists of the period, and have to make allowances for their peculiarities and idiosyncrasies, whereas with the camera we ought to obtain a true and unbiased representation, and one that our successors may rely on.

As far as possible records should be obtained of the manners, customs, ceremonies, and sports of the people which, especially in the villages, are in a transition state, thanks to County Councils and School Boards, and this class should include types of people, groups of school children, &c., as these may prove of the highest value to ethnological students; also portraits of local celebrities, geological subjects, especially when fresh excavations are being made for railway cuttings and similar purposes; coast scenery, which is ever changing by the action of the sea; our shipping and means of transport, which is being revolutionised, thanks to the introduction of electricity and motor cars; and, of course, architectural subjects, which, owing to the restorer, are always changing.

For obtaining such prints a special effort should be made to induce amateurs and others to look through their stock of old negatives, as there is any amount of work invaluable from a record point of view, now valueless because unknown; and, even if the owners cannot be induced to make prints, they might be persuaded to forward lists of such

negatives to headquarters or local secretaries, so that prints could be obtained if particularly required. As an illustration of this, the National Photographic Record Association have been favoured with the loan of some old quarter-plate negatives of bits of London which have now disappeared or have been altered, from which enlargements have been made. The views include such subjects as Old Hungerford Bridge, Somerset House before the Embankment was built, Cremorne Gardens, &

With regard to the method of working, the object of all record societies should be to arrange and carry out the work in a systematic way. To begin with, the committee of management should be composed of members representing the archaeological, antiquarian, and photographic societies, so that one branch could select and direct the work which another branch could carry out. Membership may consist of two classes, one qualifying by an annual contribution of not less than six prints, and the other class by an annual subscription, which need not be heavy (the National Photographic Society is fixed at 10s. per annum, the Warwickshire, 2s. 6d.), as the expenses should not be great, the principal item being for mounts. At the same time, if funds are plentiful, part might be available for the purchase of prints of anything of special interest from the professional photographer.

The first county to take up the work seriously was Warwickshire, and it is due to Mr. W. J. Harrison, who, in December 1889, read a paper on the subject before the Birmingham Photographic Society. The principle points in their system of working are as follows: In the first instance they adopted the old county divisions of "hundreds" as their large boundaries, and the Ordnance 6-inch map as subdivisions. Each square of this map as published represents about six square miles, and forms the distinct field of work for one or two members; by so doing it prevents all overlapping and duplication. The list of objects in each district is carefully prepared by the committee and published for the use of photographers.

The Guildford Society have adopted another method, that is, to divide the Ordnance map into distinct blocks with natural boundaries, and to furnish the members to whom a block is allotted with a corresponding plan cut from the one-inch Ordnance map mounted on card.

The question of issuing tickets to members requires very careful consideration, but it has been found best to grant tickets or cards of membership annually, and that they should not be reissued to any one not doing satisfactory work or abusing their privileges. One of the Warwickshire by-laws states each member may, upon application, obtain a printed permit authorising him to photograph within the limit of his allotted square.

It requires a certain amount of unselfishness on the part of the photographer, as the first thing he must bear in mind is the object for which he is working—viz., to secure a record—and must study the subject from that point of view, and not from the artistic or picture-making side, and must be content to work steadily on, and not just skim through the district, and pick out the choice bits and leave the less interesting though, perhaps, from a record point of view the most valuable, to his successor.

The standard size of the picture generally adopted is the whole-plate, at the same time smaller ones should not be refused, as much architectural detail can be well shown on half or even quarter-plate prints.

The style of mount adopted is as shown, consisting of a light bulb mount with a cut-out portion of grey board over. The colour suits the prints, and do not fade, and, being cut out, the prints can be stacked without fear of rubbing or being damaged. The one shown is 14 ins. \times 11 ins. outside measure, the cut-out 9 $\frac{3}{4}$ ins. \times 7 $\frac{1}{2}$ ins. This size allows of one whole-plate print, two half-plate, or four quarter-plate.

On the back of the mount are printed headings to be filled in, viz.:

- Subject.
- Date.
- Name of Contributor.
- Address.
- Remarks.

The remarks should mention the orientation of the building or direction from which the view is taken, focus of lens, and a brief and accurate (particular care being taken upon this point) description, and the title should be as comprehensive as possible. The cost of these mounts is 2s. 6d. per dozen.

Only prints should be accepted that are produced by some permanent process, such as platinum, carbon, photogravures; no silver prints should, under the circumstances, be received; and all prints should be sent in unmounted, so that they can be mounted at headquarters in a uniform manner.

In every instance, where possible, a scale should be introduced, to give an idea of the size of the object photographed. For this, the Society of Antiquaries, Burlington House, have published a very useful one, giving

English and French measures, price 6d. Failing this, the introduction of a figure will give an approximate idea of the size of the subject.

Then comes the question of storing and indexing. The best place, no doubt, is the British Museum; but, if possible, two copies of each print should be obtained, one for the local museum and one for the British; and the subject of cataloguing requires to be well considered, as no collection is of any real value unless it is readily available for reference. The Warwickshire Society have adopted the system of classifying all pictures of a certain locality or parish together; the Birmingham Reference Library prefer the alphabetical method at present; the British Museum have adopted the county method; but, in any case, a copious index and a complete catalogue should be kept at the headquarters of each survey society wherever the prints are kept.

In order as far as possible to encourage and arrange the work through Great Britain, Sir J. Benjamin Stone, in July, 1897, called a meeting of representatives of twenty of the Royal and scientific societies to discuss the matter, and the National Photographic Record Association was formed, a council and hon. secretary appointed, and a scheme of work and model by-laws were drawn up, and Sir E. Maunde Thompson, on behalf of the British Museum, undertook to receive all prints. Since then some 1400 prints have been received, mounted and forwarded to the Museum, including portraits of the leading Members of the House of Parliament and views of the House, a series of views of Windsor Castle by Sir J. Benjamin Stone; a series of studies of London slum life by Mr. Malby and Edgar Scamell; of Irish antiquities by Mr. Welch, of Belfast; of antiquities of North Britain by Mr. Diveri, of Huntley, N.E., and many others. From this district we have received thirteen from Mr. H. R. Leighton, Co. Durham, and various societies have been started in different parts of England.

In conclusion, on behalf of the Association, I ask all present to assist in the work, and if they will forward us some prints they may be assured they will be well cared for, and, if not prints, I shall be very much obliged if they will let me have a list of any negatives in their possession, of which a register will be kept, so that, if required, we may know where to apply.

I now propose to show some slides as specimens of the work required, and must ask you to consider them from the record point of view, and not as specimens of slide-making.

The slides shown will comprise views of the House of Commons, Westminster Abbey, portraits by Sir J. Benjamin Stone, Irish antiquities by Mr. Welch, antiquities round Elgin by Mr. Diveri, slum life by Edgar Scamell, Stratford-on-Avon by Mr. and Mrs. Snowden Ward, some old houses from my own negatives, and sundry others.

GEORGE SCAMELL.

BUBBLES.

[Paper read before the Photographic Convention of the United Kingdom.]

SOME of you may remember *A Study in Gum*, by an American, published in *Photograms* for 1899. It was a rather awkwardly posed girl showing a "sticky back;" and I hope some can remember a much more perfect girl's back by Mr. Fellows Wilson in last year's Royal Exhibition. The two portraits will serve well as a comparison of the bad and the good.

It is now almost universally acknowledged by artists that the one distinctive and precious quality of a good photograph is its delicate gradation (hardly to be equalled by any other black-and-white medium), and its power, for certain subjects, of rendering texture.

The study in gum referred to gives us a back that looks as though it suffered from a bad attack of eczema, and yet we are told this is what we are to live up to, that this is an advance, that this is Art.

Now, before we accept these mentors we want a reason (artistic) for changing our opinions. These gumists may shrug their shoulders and squeak and gibber for "perfect freedom," and shrilly ejaculate, "Art!" but we will not accept such shifty arguments. It is useless crying liberty when there is no liberty. We are hard bound by the mechanical conditions of our craft, and if these workers require that "perfect freedom" which they are always crying for, let them become artists and adopt media where there is perfect freedom, and leave us poor photographers alone.

Again, some of you may remember the photograph of a quite commonplace *River Scene at Hampton Court*, frame and all. The sail is altogether wrong in value, the water is woolly, and the photograph is as bad a bit of river scenery as it has ever been my lot to behold. Compare with this the neat little seascape, *Landing Cattle at Morocco*, exhibited at the

Royal. In this latter we have true values, delicate gradations, unobtrusive forms, fine texture, and no frame.

These examples will serve well to illustrate what a section of the photographic world are giving up for a mere smudge, false in every pictorial essential.

I may be told these are not fair examples, but others could easily be produced. In all the best gum work I have seen these essential and fundamental errors abound.

Now, in looking at the examples of fine carpentry or cabinet-making, shall we say, in which these precious daubs are enclosed and afterwards photographed, one is constrained to think that the ideal these amateurs set before themselves is to produce something like a *photograph of a painting*, and they imagine this is progress, this is art.

All of us, even the youngest, are liable to err, so I was careful to place a number of these gum-caricatures before one of our best painters. Shall I ever forget the jeering guffaws with which he picked up the prints; and, having been in France a good deal, he said, with a wicked smile, "Ce sont des articles de Paris," for the names of some well-known French daubers were beneath them. Now, it seems to me this "gum" printing is one of the greatest bubbles floated upon the limpid stream of pure photography, or pictorial photography, or whatever name you may be pleased to call it.

Those who would have us sell our birthright for a mess of gum will, I feel confident, never succeed in their object; and, when they talk to us of art, I, for one, will burst into mocking laughter at their solemn pretentiousness; and I regret to see amongst their number some who used to glibly talk of "subtle tonality," "values," &c.—evidently gum-paint cant on their part, and I should like to know what the young woman with the sticky, diseased-looking back thinks of the outrage. I'll warrant her back is far more lovely than such a sickly representation of it.

France has given us much in true art to be thankful for; but these *bourgeois* French photographers make us begin to wonder if the seeds of Philistinism are there, as the seeds of political and social decay are there, and strongly sprouting. As I have said elsewhere, at the last Paris Exhibition I could only discover that Scandinavia had struck any new note in art; and perhaps, after all, art itself in Paris is merely imitating a splendid tradition, and so becoming as sterile as its population. Such things have repeatedly happened in the history of Art; but I, for one, hope fervently that those ridiculous photographic travesties are perpetrated by the uneducated Philistines of that country, and a French Philistine is hard to beat. One of these scribbles a deal and causes us much amusement, and thus adds to the gaiety of nations, and gives such artists as Mr. J. Pennell a fine subject for satire.

To sum up this point: the gum process destroys tone, texture, and with it values and atmosphere; it makes the result coarse and false, and to look like the photograph of a painting—a *pis aller*, which is merely a rough index of the painting, and which no real artist is satisfied with or cares a toss about, except merely as a rough and crude memorandum to keep when he has sold his picture; and some prefer a simple pen-and-ink sketch for this purpose. And, lastly, it is hand work, and not photography. Another bubble of less pretentious size and less objection is the "dodged printing fake," for sometimes that might come true, but it rarely does. I have been greatly amused to read, in a shilling guide to pictorial photography that the greatest care must be taken in selection of the view, and in exposure, &c., so that the values may be true; and straightway he gives a ponderous apparatus for "faked printing," and advises the use of clouds taken with a small aperture, an error I long ago warned the operator against. His advice continues in the same vein, that is, to "sun down" the print, and in his work he does not hesitate, by scraping the film or some other dodge, to make garish high lights. In short, his chapter on printing is a pocket encyclopædia of how to ruin values, and often textures, and all this after telling us to work in the initial stages most carefully in order to secure true values!

Dr. Hurter and Mr. Driffield show us how to do that scientifically, so far as exposure and development go, and I have endeavoured to do it with regard to other matters, and what is the result? The same issue of *Photograms* contains a print produced by this "sun downer," and I ask you frankly, "Is it art?" It is certainly false in many respects, has a meretriciously deceptive appearance to the unwary, and deceives the amateur. But what has the landscape painter to say to it? I showed some of these prints to a great landscape painter, and he simply asked, "why the fellow did them; what was he after?"

I ask the same question: If pure photography is not good enough or "high" enough for such as he, by all means let him become an artist, and leave us alone and not try and foist "fakes" upon us.

I suppose these fakers appear in all arts—"il faut être dans le mouvement," dear boy; "must conspire with 'notions,'" like the cheap-jack; "when one stock of rubbishy goods fails, must bring out another, old friend," I suppose is the explanation. It's commerce, but is it art? It isn't photography. We all remember a painter who tried the faked photo dodge, using photography as a basis; we all, doubtless, remember what his fellow artists said; and yet he is the prince of photo-fakers, if he care to assume the title; and the poor "sun-downers" are far, far behind him at the game.

I do not suppose you, I, or any sane man cares one brass farthing or the proverbial "two penn'orth of gin" what our fakers do in the faking line if they only don't pretend to us it is something new, something we are to follow—"Art, dear boy!" The British public will have the fake of retouching, and the photographer must live; but we should think him an ass did he begin to shout and yahoo that he had found the recipe—the new recipe, mind you!—the solution of the pictorial photograph—in faking.

The appreciator of the gum plaster and photo-faking is, doubtless, the type of scribbler who is responsible for foisting the sickly monstrosities of Aubrey Beardsley upon the unwary public, and for driving Mr. Whistler abroad, and for causing dishonest dealers to cover old and worthless pictures with white of egg, and let this dry in cracks to cheat the ignorant, another form of gum-work, in fact.

Returning now to the two principal Exhibitions of last year and to *Photograms* of 1899, one meets with the gum landscape of an American. Now, if this conveys anything to any one, I ask to be instructed. A meaningless smear is said to represent *Mountains in North Carolina*. Now, it is said Americans do things on a big scale; but, to judge by that plaster, the mountains of North Carolina look very much like a photograph of a scrubby English hedge that has been "treated" by a good brawny British road-scraper who has set about clearing the countryside up. So much for the great rushlight of the American school. Mr. Steiglitz and Mr. Day are the best exponents of American photography, and I rejoice I've seen no gum-plasters or fakes by either, and I hope I never shall. Then we have the French "school" and its infants. In *A Spring Snow* we find the composition is childish; in *A Lark Shooting*, which might have been good had it been pure photography, though it only proves the Frenchman as ridiculous at *le sport* as M. Tartarin, of Tarascon; the coarse daubs of white, and lack of tone value in what might have been a beautiful and delicate distance, ruin it, and prove the 'prentice hand. Next we find another worker's theatrical and ill-posed women. They recall the sweepings of the worst type of Paris *atelier*. The chief interest is that this amateur has an island where he retires with his models, an idyllic picture that makes one long Mrs. Grundy were dead and her soul gone to Paris. This series finishes with two commonplace, most penny-plain peasants, *Returning from the Fields*, and *A Study*, a young woman performing athletic feats with lilies; and all along with this jumble of inanities we have the most solemn, inane, and pretentious letterpress by the great and original gum-splodger himself. It is, indeed, a relief to turn to the manly and healthy works of our Colonial brethren in New Zealand.

But to continue. Of what avail is such a picture as that hung in last year's Royal, *In June?*—woolly trees, degraded lights, impossible grass—and all to represent June, the glorious month of light and leaf. The photo looks like a miserable December evening, with the leaves as though suffering greatly from cell congestion. Another equally bad Salon companion picture was a *Gleam of Sunshine*. "Subtle tonality," again, I presume—only gone wrong. As dismal a sun as one could expect in Hades.

I appeal to you, is this photography? I am sure it will not last—cannot last; and we will welcome the new parlour biographs, if only as a sure and certain kill-all for these pretentious bubbles.

A painter and I sat down one night to select, from the publication referred to, what we considered the two best photos in it pictorially, and what think you they were? Mr. Tingley's *Light Beyond* and Mr. Campbell's *Messengers of Death*, and, lo! we found the latter was included in the *Technical Section*. On the other hand, the very worst in the book—to which we adjudged, too, the wooden spoon—was *A Pond at Weston Green*, which seemed to us to possess every ill that photography is heir to; and this to me was all the more regrettable since the producer of that abominable daub has done some beautiful things in pure photography and platinotype, and may he renounce false gods and return to the style of his saner days.

There was a time when the great bubble of sharpness enveloped the photographic world, but that has burst, and the explosion thereof seemed to have upset the sanity of some, who have been carried away in the ex-

plosion and lost all reason and sense, all tone and texture, those vital and great qualities of photography.

Another bubble that seems to get into the eyes of some of our chemical friends, and which they are constantly playing shuttlecock and battledore with, is the "control in development" question. By all sorts of high-sounding devices they are constantly telling us how they can modify results, and therefore, say they, P is A, or Photography is Art. Now, our good chemical friends are the most respectable of men—the fathers of families, eke churchwardens—but they have never even told us how by stirring up something we can make one specific tone lighter as against another. They give us varied results which have no real bearing on the issue at all; but, until they can tell us how a certain wall (say) is to be made lighter or darker as against a certain other wall, and the rest of the picture to remain *in statu quo*, they cannot legitimately deduce P is A, or else they are but logically arguing after the manner of cause and effect of Tenterden Steeple and the Goodwin Sands.

This is a small matter to them, perhaps, but it is of fundamental importance concerning the point at issue, and Dr. Hurter and Mr. Driffield told me it could not be done; and, until one of our friends does it, I shall continue to say P is not A, and add Q.E.D. after the manner of dear old Euclid.

I claim no originality in further destroying these bubbles. I have let them grow and grow, unopposed by me for years, to see if they could give us a new and valuable hint of any kind; but are they doing us any good as a body? We have been held up to ridicule by an able artist, Mr. J. Pennell, in one of the leading reviews; by an artist who was a photographer, and I trust the home truths in the perhaps unpalatable article to many have not been forgotten, though the writer went too far to prove his case, but he said many truths that should not be allowed to drop, for it must not be thought he had any ulterior motive. That I don't believe for a moment; the pretensions in framing and daubing would naturally arouse the ire and sarcasm of any good artist, and many artists I know have said similar and worse things than Mr. Pennell enunciated. To many of us his remarks in no way referred; and if any of us wish to gain the esteem of artists, and, in the long run, of photographers as well, I feel sure the abjuration of all these illegitimate and resuscitated "fakes" is the only royal road. And it delights me to find the responsible press of the photographic world has sternly set its face against such humbug.

DR. P. H. EMERSON.

RESIDUES, AND WHAT TO DO WITH THEM.

[Paper read at the Photographic Convention of the United Kingdom.]

It can hardly be expected at the end of such a busy week that the subject of residues can be fully dealt with, for an amateur to address an audience chiefly of professionals seems a little out of place. Further, I have little to add to what the press has so fully written for years past.

Briefly, I may tell you that I found the residues of the gold toning bath so much resembling the residues I had to do with in my business of a goldsmith, that I determined to find what the value of the old toning baths really were. To that end I dissolved 2 ounces of sulphate of iron in a quart of hot water. This I put into a two-gallon jar, and as the baths were used up they were poured into the jar after two years. The precipitate was filtered, dried, and burned in an iron ladle; it was then a heavy brown powder. To this I added twice its weight of pearlash, after much mixing in a mortar, put into a crucible and submitted to a strong heat for an hour, and this gold was in the bottom of the crucible and weighs $\frac{1}{2}$ ounce troy.

I had it flattened out to what you see, just in the state in which gold-beaters use in the manufacture of gold leaf. The amount of gold recovered I estimate to be seventy per cent. of the twenty-four 15-grain tubes bought. I expected to have found some silver from the albumenised paper toned, but I did not. The gold by assay is 23 $\frac{5}{8}$ carats of fine, or 996 in 1000.

This is another button similar to the first, only heavier. Of silver residues I have only saved the first washings and trimmings of albumenised paper. Common salt was used as a precipitate, and treated generally the same as the gold; it weighed over 11 ounces when it was put into the crucible, now it weighs nearly 5 ounces.

These products prove most conclusively the value of residues.

Having introduced the residues, it is now my duty to demonstrate to you the uses to which they can be put, or at least one use.

I was asked by the Committee of the Council to repeat a demonstration which I had given shortly before at the Camera Club, London, and I have prepared material, and am ready to proceed to make a ring, if you, sir

MEMBERS OF THE FIFTEENTH ANNUAL PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.
HELD AT NEWCASTLE-ON-TYNE, July 9th-10th, 1900.

Henry Greenroot & Co., Printers and Publishers, 2, Wellington Street, Strand, London.

Negative by W. Parry, Photographer, South Shields.





Mr. President, give the word and necessary time. I propose to make a gentleman's hoop ring, weighing about $\frac{1}{2}$ ounce, by alloying 9 dwts. of fine gold with 2 dwts. of F silver and 1 dwt. of F copper, producing 12 dwts. of 18 carats gold.

To melt these with a common blow pipe, and a gas flame, upon charcoal, to cast same into an ingot of gold, to forge, shape, and prepare for soldering the ends, thus completing the circle.

The finishing the ring must be left for another time, it is getting late, and I will not weary you any longer.

S. B. WEBBER.

DESICCATED DRY PLATES.

A PRELIMINARY NOTE.

[Paper read before the Photographic Convention of the United Kingdom.]

It is well known that dry plates, as ordinarily used, retain a considerable percentage of water, mainly in molecular combination with the gelatine. I find that the presence of this water in the film at the time of exposure has a large influence on the image, all the chief characteristics, i.e., definition, detail, density, speed, time of development, &c., being affected. Moreover, very small differences in the quantity of this moisture materially affect the result, so that negatives vary with the atmospheric conditions, as to temperature and humidity, at the time of working.

The drier the film, the better the definition and the greater the power of rendering fine detail; in lesser degree, the greater the speed and facility of developing density.

This property of the film can be utilised by desiccating plates for work where definition, detail, brilliancy, or maximum speed are desired, and in exposing plates wet where softness of image or the destruction of small textures and details are sought for. Extra-rapid plates or orthochromatic plates, in which the former of these qualities are usually found lacking, gain them when thoroughly desiccated to an extent hitherto only found in wet collodion or other specially prepared films.

A perfectly flat-topped kettle containing boiling water is a convenient appliance for desiccating plates. They are simply laid on the flat top of the kettle with a piece of bibulous paper between to equalise the heating, and kept there a few minutes at a temperature of 200° before being placed in the slides, or a thick copper slab with an asbestos cover can be used. Too great or too prolonged heating will crack the film or induce fog.

Desiccated plates have been (with increasing satisfaction) in daily use here at the Polytechnic for several months past, and are already widely adopted in the trade and for scientific work.

E. HOWARD FARMER.

THE SENSITIVENESS OF SILVER AND OF SOME OTHER METALS TO LIGHT.*

[A Paper read before the Royal Society, May 31, 1900, and reprinted from the *Chemical News*.]

Images Formed on Both Sides of Exposed Glass Plate.—In connexion with this action through glass, a curious result obtained on a plain glass plate may be mentioned. A piece of clean glass plate was exposed for a day and a half in October under the same aluminium screen, with another glass plate over it, so as to protect the surface from the air. It showed a clear breath image, but mercury vapour did not produce any image. Iron development, however, brought out part of the design very clearly, the silver depositing upon the unexposed parts, and giving an image darker and clearer than the ground. The image of the design appeared by breathing on both sides of the exposed glass plate, so that the action of light went through both plates.

Effect Produced on Varnished Silver Glass.—With the same object of ascertaining whether the images could be produced when the silver surface was protected from the air by varnish, a silvered glass plate was coated over one half with photographic negative varnish, and then exposed in the usual way, under the cut-out paper mask and mica screen, in October. After exposure for two days, the image of the black-paper mask, the cut-out initials, and edges of the mica screen were not reproduced so clearly as usual, though they appeared readily enough on the unvarnished half when breathed upon. The distinct heightening of the effect under the varnished part is apparently due to some chemical combination, probably oxidation, or the formation of an organic silver compound sensitive to light. When the varnish is removed the strong image remains, and there is a distinct change of colour in the exposed part of the silver surface, which takes a

sort of yellowish olive-grey tint. Recent repetitions of the experiment with silvered glass, and with a plate of nearly pure silver, gave exactly the same results. It may be noted that with iodised silver plates the same varnish has been found to exercise a decidedly retarding effect on printed-out images.

Probable Cause of the Effects Described.—As regards the cause of the peculiar effects described, and the nature of the visible and invisible but developable images produced by the action of light upon plain silver surfaces, it is very difficult to give any definite opinion. It would seem that in this, as in most photographic processes, the first action of light is principally molecular, but, if the exposure be prolonged and takes place in the air under ordinary conditions, there is a certain chemical decomposition of the surface of the plate, and the impressed image becomes distinctly visible.

Moser.—Moser was of opinion that the action of light does not necessarily consist in the separation of two chemically combined bodies, even in the Daguerreotype, in which process he maintained there is no separation of iodine from silver under the action of light. (We now know that the iodine evolved is absorbed by the underlying silver.) He brought forward his experiments on pure surfaces of silver, where, he says, there can be no possibility of a chemical action to show that the effects of the Daguerreotype could be produced in quite a different way.

Waidele.—Waidele (*Pogg. Ann.*, 1843, vol. lix.), although he does not refer to Moser's observation of the direct action of light upon silver, and concerns himself more with the contact actions attributed to invisible light, concludes that Moser's effects are not produced by any action of invisible light, but must be rather explained by the action of atmospheres on bodies and the absorption of gases. He points out that polishing powders, such as tripoli, charcoal, &c., ordinarily contain moisture and absorbed gases, for which they have a strong attraction, and, if used in this state, they give up these vapours to the surface polished. If, however, they are heated to a red heat to drive off all moisture and gases, they then act as absorbents, drawing out the moisture and gaseous impurities from the surface of the metal, and producing a far purer and more perfect polish. He also notes the effect of carbonic acid, hydrogen, and other vapours on iodised silver Daguerreotype plates.

So far as my experiments go, I do not think that the nature of the polishing materials has had much influence on the results obtained, though it is an interesting point, which might be looked into.

Roscoe.—Roscoe (*Watts's Dict. of Chem.*, 1872, ii. p. 805) also attributes the Moser effects to absorbed gases, and says: "Almost all of the singular phenomena first investigated by Moser, and ascribed by him to the action of latent light, may be more rationally explained by the authenticated facts of the absorption of gases by solid bodies." He also refers more particularly to the contact or "breath" images produced by laying coins, &c., upon polished plates of metal.

Action of Gases.—It is evident that, if there be any chemical action on the silver under the influence of light, it must be produced by the agency of gases or vapours contained—

- (i.) In the silver itself.
- (ii.) In the layer of air or condensed gases in immediate contact with the plate.
- (iii.) In the surrounding atmosphere.

(iv.) In the masks or coverings under which the exposures are made.

What the exact nature of the decomposition may be, and to which of these agencies it is attributable, is not easy to ascertain, nor does the appearance of the visible image give much clue to it. From the dull-grey colour of the exposed parts it seems, however, probable that oxygen plays an important part in the action; but whether the oxygen is drawn from the air or is disengaged from the metal itself, or whether both actions take place with interactions of other gases occluded in the metal itself or present in the atmosphere in contact with its surface, there is nothing so far to definitely show. It seems also probable that, as in many other photographic processes, the presence of watery vapour is necessary to bring about the decomposition. These points require further investigation at a time of the year when the light is bright, and the effects can be observed under the most favourable conditions. From the fact that in most of my experiments the external air has been excluded by the outer glasses of the printing frames, we may, I think, conclude that the effects are due more to the gases or vapours occluded in or attached to the silver surface or to the screens rather than to any outside atmospheric influences.

Oxygen Found in Silver by Graham.—With regard to the presence of oxygen in silver, Graham found that silver heated and allowed to cool in oxygen could occlude 0.745 volume of oxygen, which was permanently fixed in the metal at all temperatures below an incipient red heat. I.

*Concluded from p. 442.

did not tarnish the bright metallic surface of the silver, or produce any appearance suggestive of the oxidation of a metal. He further showed that silver in the form of sponge can occlude eight volumes of oxygen without any visible tarnish. Silver appears to have a relation to oxygen similar to that exhibited by platinum, palladium, and iron to hydrogen. Silver can also occlude variable quantities of hydrogen, nitrogen, and carbonic acid (*Phil. Trans.*, 1866, p. 434).

Dumas' Observations.—According to Dumas (*Comptes Rendus*, 1878, vol. lxxxvi. p. 69), 1 kilo. of pure silver, prepared by fusion with borax and nitre, was heated in a vacuum to a temperature not exceeding a dull red, about 500° or 600° C. The evolution of gas continued for about six hours, and it was received over mercury. The gas given off was pure oxygen, amounting to 47 c. c. at 0°, and 760 mm. of pressure for 1 kilo. of other silver, and weighing 82 milligrammes. In two experiments in which silver was fused in a more oxygenated atmosphere, as much as 158 c. c. of oxygen, weighing 226 milligrammes, and 174 c. c., weighing 249 milligrammes, were obtained from 1 kilo. of pure silver in each case. He found also that silver which contains oxygen does not lose it all in a cold vacuum.

Mallet's Observations.—Professor J. W. Mallet, in some investigations on the atomic weight of aluminium, notes these results obtained by Dumas, and states that, in his own observations of the same kind, but using a lime support for the silver heated in a hard glass tube to a moderate redness, he obtained only 34·63 c. c. of oxygen from 1 kilo. of silver (*Phil. Trans.*, 1880, p. 1020).

These different observations show that silver, apparently pure, may contain a very considerable quantity of oxygen, and I believe it is a well-known fact, especially in the mints, that oxygen is nearly always present in silver, with or without hydrogen, carbonic acid, and other gaseous impurities in much smaller quantities.

Whether occluded oxygen is the cause of the photographic effects produced on surfaces of apparently pure silver might readily be proved by extracting all the oxygen from a silver plate by the above methods, and then exposing the resulting purified silver to light, a similar plate from which the oxygen had not been extracted being exposed at the same time. I have not the appliances at my disposal for making this experiment.

Effects of Heating Silver Plates to Redness.—With regard, however, to the effect of simply heating the silver plates to redness, the following experiments may be of interest, and seems to show that the heating whether accompanied by subsequent "blanching" or "pickling" in dilute sulphuric acid or not, causes a distinct loss of sensitiveness, and in some cases may destroy it entirely.

A piece of thin, pure silver plate was first of all heated to a red heat over a spirit lamp, then plunged into dilute sulphuric acid, and, after being washed with distilled water and dried, was exposed for about two days and a half, partly in sunshine, at the end of September last, under a screen of mica carrying a cut-out design in tinfoil, which had also been passed through the flame of a lamp. No visible image was produced, nor did one appear by breathing on the plate. Development with acid ferrous sulphate and silver nitrate brought out traces of the opaque tinfoil mask, and of parts cut out of the mica. The free ends of the plate, which were exposed to the air all the time, did not show any distinct attraction for the developer.

Another plate of pure silver, well cleaned with "meteoric" polish (No. 2), and exposed as usual under a mica screen with black-paper mask only one day longer than the last plate, gave a very strong visible image requiring no development. There must, therefore, have been a considerable difference in the conditions of the surfaces of the two plates.

In the plate which was heated and then treated with dilute sulphuric acid, it may be assumed that any surface layer of condensed gases must have been destroyed, and a surface of pure metal exposed, which, as one would expect, was not visibly sensitive to light. In the other case, in which the plate was probably oxidised (it had been lying by for several years), and was simply well cleaned with a dry polishing powder, the surface of the metal was left so sensitive to light as to give a strong visible image. This difference of action in two plates, which were exposed to the same conditions of light, seems to show that the effect produced by light on surfaces of metallic silver are chemical rather than merely molecular in their nature.

A repetition of this observation gave similar results. Further, a plate of thin silver foil, well heated over the spirit lamp and exposed under a mica screen, which was also heated, for two days, including some hours of sunshine, showed no image, even on development with mercury, although distinctly visible images had been obtained on the same piece of foil when cleaned in the ordinary way and exposed under the same or similar screens. Further experiment on this point is still necessary.

Effect on Silver Surfaces Fumed with Acid and other Vapours.—A

good many experiments have been made with silvered glass plates or silver foil, fumed with various vapours, which might possibly be present in small quantities during the exposure to light, among them hydrogen peroxide, nitric acid, ammonia, also sulphurous acid; these plates have all shown visible and developable images of a somewhat similar character to those formed on the plain metal.

Nitric Acid.—By fuming silvered glass plates with ordinary pure nitric acid (1·420), or, better, with the same acid diluted with an equal volume of water, very clear positive printed-out images have been obtained, even with the comparatively short exposure of one hour in the February sun. With a longer exposure the image was clearer, the exposed parts appearing lighter than the protected parts, as is also the case with the plain silver surfaces.

Dilute Ammonia.—Dilute ammonia, containing one part of the solution at 0·880 in thirty of water, gave a similar image, but the film was not so sensitive as with the nitric acid. Further experiments have, however, to be made.

Dilute Sulphurous Acid.—Dilute sulphurous acid, formed by acidifying a solution of sodium sulphite with sulphuric acid, gave a weak image of much the same character.

Hydrogen Peroxide Solution.—Silvered glass plates, fumed with various strengths of hydrogen peroxide solution, have given fairly sensitive films, sometimes a little white in appearance, but as a rule the printed-out images produced on exposure to light are just the reverse of those produced on plain plates and those fumed, as noted above, i.e., the parts exposed appear darker than the unexposed parts, and do not attract mercury vapour, so that a positive picture is produced from an ordinary black and white negative. By long exposure this effect is sometimes reversed. The visible images produced on silvered glass plates fumed with the peroxide quickly fade away, though the details may still remain visible on breathing. The same effect of fading out has also been observed on plain silver plates.

Rain or Boiled Distilled Water.—Silver plates exposed under fresh, clean rain water, or boiled distilled water, gave distinct images on development with mercury, but not very readily, and further observations are necessary.

Exposures in Fluid Hydrocarbons.—In order to ascertain whether the images would be produced on silver surfaces exposed in fluid hydrocarbons containing no oxygen, silvered glass and pure silver foil were exposed in fluid paraffin, benzole, xylol, and toluol.

Paraffin.—In clear, colourless, fluid paraffin very strong dark olive-yellow images were produced by light on silvered glass and silver foil on the parts exposed freely in the fluid or under the parts cut out of a black cardboard mask, but under a mica screen, which covered part of the black mask and of the plate itself, there was no darkening action whatever. The darkening appears to be due to sulphuration, but why it should not occur under the mica is not clear, unless the latter cuts off the rays which are active in producing it.

Benzole.—Silver foil well cleaned and exposed in ordinary rectified benzole under a cut-out black-paper mask, and also half covered with mica, showed very clear, yellow images of the cut-out design on the part uncovered by the mica, apparently by decomposition of the thiophene or other sulphur compound present in the benzole. This darkening required strong sunshine to produce it, and on prolonging the exposure in the sun the metal became quite bronzed in the uncovered exposed part, while the part protected by the mica also took a light tint. It may be noted that, as a rule, the backs of these clips of foil (which were exposed in test tubes) were not protected by any covering, but showed no perceptible change of colour; the darkening of the exposed foil was therefore solely an effect of light.

Effect of Heating the Foil.—A piece of the same foil was exposed in the same way in the same benzole after being heated to redness. This did not show such a strong image, even by long exposure in the sun.

A piece of pure foil (assay foil) was exposed in a purer sample of benzole, and also gave a distinct yellow image as soon as the sun acted upon it after some days' exposure, the light being dull till near the end of the period. Another piece of the same foil, heated to redness and exposed at the same time, only showed a very pale yellowing.

Xylol.—A similar very faint, but browner, change of colour was noticed on a piece of the same foil, not heated, exposed for several days in commercial pure xylol.

With toluol similar results were obtained after long exposure.

Effects of Light upon other Metals.—A few observations have been made as to the action of light upon other metals; but, with the exception of lead, none of them have proved very sensitive, and further work is necessary in good weather.

Gold.—Images developable with mercury have been obtained on gold leaf by prolonged exposures, but scarcely any trace of a developable image could be obtained on some highly polished well-gilt buttons exposed for several days in good sunshine in October.

Lead Foil.—On pure lead foil I have obtained a very distinct darkened image visible after exposure. Very distinct darkening was also produced on lead foil exposed in pure benzole.

Copper.—On copper, distinct visible images have been obtainable sometimes, but the metal is not so sensitive as silver to light, though I have readily obtained heat images on it, developable by mercury. Pure copper foil exposed in sunshine in pure benzole showed a distinct darkening, but, exposed in xylol, it did not change colour.

Nickel, Platinum, Aluminium, Palladium.—Nickel, aluminium, and platinum appear to be quite insensitive to light, but with a small button of palladium, kindly lent to me by Mr. T. Bolas, which was exposed for some days under a black-paper mask, there appeared a slight but fairly distinct trace of deposit of mercury on the exposed parts. The spot was too small to make sure of.

Trial with Röntgen Rays.—With the kind assistance of Mr. F. H. Glew I was able to make a few experiments with the Röntgen rays upon silvered glass and pure silver plates, exposed for several hours to the rays, but without any visible or developable effect.

The above is a summary of my observations in this direction so far as they have gone. I hoped to have made them more complete, but the dull winter weather has been very much against such work. I hope, however, to go on with it during the summer, but think it advisable to publish the results already obtained now, in order that others may be able to extend them at the same time. They show, I think, that most of the phenomena that occur by the exposure of ordinary photographic plates containing haloid compounds of silver can be observed upon a plain silver plate exposed to light in the air under ordinary conditions. It seems not impossible, therefore, that the key to the hitherto unsolved problem of the production and constitution of the so-called "latent photographic image" may be found within these limits.

MAJOR-GENERAL J. WATERHOUSE, I.S.C.

THE AMATEUR PHOTOGRAPHIC ASSOCIATION EXHIBITION.

SUPPLEMENTING our last week's notes on the Exhibition of the Amateur Photographic Association, of which the Judges were the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, Major-General G. F. Kaye, Mr. J. Lillie Mitchell, and Mr. Butler Humphreys, we append a list of the exhibitors, with the number of the photographs entered for competition in each class:—

Class A.—Robert O. Milne, 9; W. Smedley Aston, 3.

Class B.—S. Bourne, 4.

Class C.—Robert O. Milne, 2; Albert S. Hicks, 4; S. Bourne, 4; Hugh V. Smith, 18; E. Cecil Hertslet, 4; W. Smedley Aston, 4; Rev. Edward Jervis, 4; Hesketh Pembroke, 4.

Class D.—Robert O. Milne, 3; Hugh V. Smith, 4.

Class E.—Hugh V. Smith, 5; Robert O. Milne, 2; Mrs. S. F. Clarke, 8; Albert S. Hicks, 4; W. Smedley Aston, 4.

Class F.—Mrs. S. F. Clarke, 4.

Class G.—None.

Class H.—Edward Kennard, 1; Robert O. Milne, 4; F. S. Schwabe, 3; H. Gething, 1; Flag-Lieutenant M. A. Kennard, 1.

Class I.—None.

Class J.—Robert O. Milne, 2; Hesketh Pembroke, 1; E. Cecil Hertslet, 1; Captain L. E. Kennard, 1.

Class K.—S. Bourne, 4; A. S. Hicks, 4; J. W. Budd, 6; R. W. Kennard, 1.

Not for Competition.—Captain L. E. Kennard, 3; Flag-Lieutenant M. A. Kennard, 2; Edward Kennard, 2.

Class L.—None.

Class M.—None.

Exhibits consisted of a frame or frames containing one or more photographs.

The following awards were made by the Judges:—

Class A (Champion).—No award. The Judges did not consider that the number of entries warranted them in awarding the prize.

Class B.—The custody of the Challenge Bowl is awarded to Albert S. Hicks, Stoneleigh, Bromley, Kent (for Exhibit No. 25); the prize of 5*l.* 5*s.* was withheld, as there was not a sufficient number of artistic pictures in competition.

Class C.—First prize, Albert S. Hicks, Bromley; second, W. Smedley Aston, 7, Newhall-street, Birmingham; third, E. Cecil Hertslet, H.B.M.S. Consul, Havre.

Class D.—First prize, Robert O. Milne, Leamington; second and third withheld.

Class E.—First prize, W. Smedley Aston; second and third withheld.

Class F.—First prize withheld; second, Mrs. S. F. Clarke, Louth, Lincolnshire.

Class G.—No entries.

Class H.—First prize, Edward Kennard, The Barn, Market Harborough; second, Robert O. Milne, Leamington; third, Flag-Lieutenant M. A. Kennard.

Class I.—No exhibits.

Class J.—First prize, Robert O. Milne; second, Captain L. E. Kennard, Meerut, India.

Class K.—First prize, S. Bourne, Brightlands, The Park, Nottingham; second, J. W. Budd, 24, Austin Friars, E.C.

Classes L and M.—No entries.

Class N (consolation prize).—No award.

We are asked to state that Mr. Butler Humphreys, one of the Hon. Secretaries, whose address is 106 and 108, Regent-street, W., will be pleased to give any information additional to that contained in the book of rules from which we quoted last week.

PHOTOGRAPHIC SOPHISTICATION.

[A Paper read at the May Meeting of the Photographic Society of Philadelphia.] THERE was a time when the veracity of the evidence afforded by the camera was accepted with unqualified acquiescence, but a time followed quickly when confidence in its results, as an unfailing index of facts, began to suffer by probation; and those who had implicitly believed in its infallibility learned that, like the witches which Macbeth met upon the blasted heath, photography could "lie like truth."

The *Deus ex machina* often made it become a "lying spirit to deceive," so that on occasions it could prevaricate with the aid of certain angle lenses, or by elevation or depression of tripod legs. It is not our object at present to discuss the ethics of photography, but to show how a qualified deception is legitimate, nay, even expedient, from an artistic standpoint of judgment, since the deception, like the cheat of vision in legerdemain, is admitted for the compensation which the deluded sense receives in the pleasure experienced. Hitherto monochrome photography has held whatever art status it possesses, in *fee simple*, by its faithful representation of nature in whatever phase she is presented to us, by methods peculiar to photography, and not by artistic dodges or devices.

Painting has its peculiar, legitimate methods which hitherto have not been considered peculiar or legitimate to photography. Painting, justly, because of necessity, has recourse to all sorts of tricks to cheat the imagination, to convey to the mental vision the impression which a superbly coloured landscape gives to the mind through the physical eye. The "faking" or "dodging" which painting must make use of is resorted to not because the painter despises to give us an actual transcript of the harmonious colouring, but by reason of the limitation of his means to do so. Painting suggests nature, and is consistent in the treatment, but in suggesting is often compelled to give us a colour or a form which is not an actual embodiment of the thing (a form, we say, because colour often deforms objects to human vision, though not to the eye of the camera).

My opinion is perhaps not of much weight with the shining lights of the new photography—I have not yet found out how to get ecstatic over symphonies in yellow or nocturnes in blue—but it seems to me that photography is running on crutches when it forsakes its own legitimate method of monochrome, and endeavours to imitate the results of the painter in colour. Such photographs look only like poor copies of paintings, and, despite the ability displayed in the composition, one grows weary of them. Photography has won "golden opinions," which should be "worn in newest guise, not cast aside so soon." The photographer's "style" is simply his way of setting forth his ideas, and though the rules of art, in its application to photography, are somewhat restrictive, yet they are sufficiently general to allow scope for individual action. Indeed, there is a tendency to too great laxity in photographic style, and photographers are sometimes rather rash in their attempts at originality of conception, presuming that the correctness or falsity of the idea is dependent upon the power to please some one, believing that art, like poetry, is addressed to the world at large, not to a special jury of professional masters, and that the technical qualities are only means to the public end.

To a great extent this is true, and the question after all is, How far do pictures, by brush or camera, tend to the object of all the fine arts—enduring pleasure?

The public cares little for method—it is the effect produced which excites in people pleasures, and perhaps here, too, the public is right.

The poet is not restricted to measure of a certain kind in giving expression to his thoughts, and we are told that one painter lays on the paint so smoothly that not a brush mark is perceptible, while another uses a palette knife, a trowel, or, it may be, a shovel. Photography, like painting, has a tendency to drift away from nature's simplicity, and the photographer tries to persuade himself that he is dressing up nature to advantage by studio tricks, by sensationalism, or by bizarre posing.

These tricks, with the gloss of novelty upon them, pass current a while for the gold of art. The ruling fad sanctions them, and false taste and prejudiced Salon Judges demand pictures made by such facile artifices, until, by familiarity with what is false, one gets so perverted in taste that it becomes impossible to distinguish or appreciate the beautiful and the true. When some one, who, braving the *turn-downs* of the jury, has courage to offer a natural picture, lovely in management of light and shade, but modest in conception, we view it through the defracting medium of a set standard of fashion, and adjudge it altogether too commonplace or ordinary in treatment and illumination.

Sensationalism is a step downward, since it tempts the photographer, by its very demands, to dash and coarseness, to carelessness of manipulation and disregard of technical qualities, and the assumption of the various other forms of mere effect. Then, in turn, it leads the photographer to subjects either vulgar or profane—profane in the sense of disregard of the true aim and province of photographic art.

When photography undertakes to present on the walls of our photographic rooms the agony of Golgotha, and has a yellow baise exhibition, space all to itself and a set of counsellors, skilled in art-puffery, to glorify its merits in our photographic magazines, photographic art has reached a dangerous pinnacle of sensationalism. It is by this adulation, as well as by the ability displayed by the photographer in the production of such pictures as the *Dead Christ*, the *Crown of Thorns*, or the *Crucifixion*, that the dangerous effect upon photographic art is heightened.

As Charles Lamb says: "Instead of realising an exalted idea, we have only materialised and brought down a lovely vision or a sublime and intense feeling to the low standard of the flesh."

But I am afraid I am like Josh Billings, who announced a lecture on "Milk," yet made no other allusion to the lacteal fluid than in the announcement (but this is my infirmity). My topic is "Photographic Sophistications;" and, as sophistication may be defined as that which gives the impression of truth and reality by falsity and unrealness, I shall endeavour to show by a few illustrations that such a method might be accounted as legitimate, in accordance with the *dictum* of the modern school, for inciting effect in the beholder.

In other words, I have made the camera a "lying spirit to deceive," and have sought to cheat the sense of vision by presentation of natural scenes, in which the natural objects of landscape have no lot or portion.

If faking of negative and print is admissible to produce pleasurable effect, why not faking of the original scene itself?

I have collected a few twigs, pieces of stone, moss, coal, sand, ashes, a bar of soap, old corks of bottles, rags, cinders, &c., and have endeavoured to build up with them the simulation of a landscape picture.

The endeavour was begun in a mere spirit of mischief, but I builded better than I knew, and the result demonstrated to me that the method of pictorial effect in the hands of some one possessed of more artistic perception might result in something far more rare and strange.

The amount of personal enjoyment derived from the exercise of the faculty would more than compensate for the pains bestowed in the creation. I hope the pictures I show will not be too severely judged artistically, since I have revealed the *modus operandi* of their evolution.

JOHN BARTLETT.

GAUT AND ROUSE'S IMPROVEMENTS IN CAMERAS.

[Patent No. 7474 of 1900.]

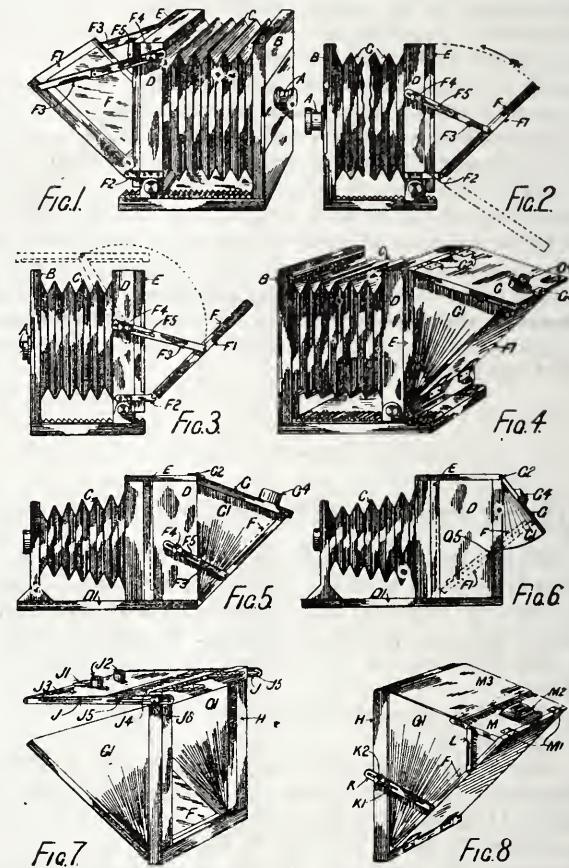
The invention has been specially devised in order that the operator at the camera will be able to observe a reflected image of the object to be photographed as it appears on the focussing screen with said image in an uprightly uninverted position, that is to say, not reversed vertically as such reflected images have heretofore been seen. The reverse image cast by the lens on to the focussing screen direct or transferred from the lens on to said focussing screen by a reflector will be reflected uprightly uninverted to the operator's vision.

The improvements consist primarily in the combination and arrangement with the focussing screen of the camera of a mirror or reflector set

angularly upwardly and outwardly from the lower edge, or from near the lower edge, and to the rear or outwardly of said focussing screen.

Fig. 1 is perspective view of a bellows camera with these improvements attached, the angularly set mirror or reflector at the rear of the focussing screen being of a very simple construction. A is the lens, B the front frame of the camera, C the bellows, D the back frame of the camera, which may include a "swing back," E the frame of the focussing screen attached to the back frame, D. The angularly set mirror or reflector, F, is held in a frame, F¹, jointed at the lower part of frame, E, by means of tag-pieces, F², screwed on to the back frame, D, or the swing back forming part thereof which form a hinge upon which the lower part of the reflector frame, F¹, has movement. The upper end of said frame, F¹, is supported by side bars, F³ (jointed in the centre so as to facilitate folding), adjustably affixed to the frame, D, by set screws, F⁴, through slots, F⁵. It is easily to be seen that the inclination or angularity of the mirror or reflector, F, may be adjusted by the movement of the slot, F⁵, backward and forward of screw, F⁴.

This camera is used with the ordinary focussing cloth, and the image cast by the lens on to the ground-glass focussing screen in the frame, E, is reflected upon the said mirror or reflector, F, and it appears there in an uprightly uninverted position, that is to say, unreversed vertically. As well understood, when the image is properly focussed, the ground



glass in the frame, E, is replaced by the dark slide and the sensitive plate exposed. For carriage, the frame, F¹, is folded inwardly on to the frame, E, the medial joint in the side bars, F³, allowing of such, or, if preferred, the frame, F¹, may be sprung from the tag pieces, F², and the side bars, F³, removed from set screw, F⁴.

Fig. 2 is a side elevation of a similar camera to that shown in fig. 1, with the angular mirror or reflector angularly set in a similar manner to that shown in fig. 1, and in this figure similar letters of reference denote similar parts to those described with reference to the latter. In this case the side bars, F³, are set lower down on the frame, F¹, and the set screw, F⁴, is set lower down on the frame, D. In all other respects the parts are similar. The position to which the frame, F¹, with the mirror, F, may be swung, if it is not desired to use the same, is shown by dotted lines.

Fig. 3 is a side elevation of a similar camera, to which an angular mirror or reflector is attached, in substantially the same way as in figs. 1 and 2. In this case, however, the tag pieces, F², have jaws in which to receive pintles upon the frame, F¹, and the side bars, F³, are joined to it at about midway of the frame, F¹, so that, as shown by dotted lines, when it is not desired to use the reflector or mirror, it may be swung upwardly out of the way.

Fig. 4 is a perspective view of a similar camera, to which a hood or covering for the angular mirrors or reflector is affixed so that the focusing cloth is dispensed with. In this case the parts of the camera are of similar construction to those described, and are as follows: the front frame, B; the bellows, C; the back frame, D; the focussing

screen frame, E; and the angular mirror or reflector, F, with its frame, F¹. This frame is hinged to the frame, D or E, as shown, and between it and the frame, E, is stretched the bellows-shaped side piece, G¹. The top of the cavity thus made is closed in by rigid lid or cover, G, hinged at G², to the frame, D, or to the frame, E, and fastened to mirror or reflector, F, by spring clasp, G³. In this cover, G, are spy holes or eyepieces, G⁴.

In use, the operator directing his vision on to the mirror or reflector, F, through the spy holes, G⁴, will perceive thereon a picture in an uprightly uninverted position. For carriage, the clasp, G³, being unloosened, the mirror or reflector, F, is closed in on its hinges, compressing the bellows sides, G¹, and the top, G, being then closed down over them both. The spring clasp, G³, can be utilised to keep the whole in place.

Figs. 5 and 6 show these improvements attached to those classes of photographic cameras which have a cavity at the back of the focussing screen frame for the purpose of carriage of dark slides and the like. In fig. 5 the reflector, F, is hinged to the end of the hollow frame, D, which forms the cavity, or it is hinged to the baseboard, D¹. It has side bars, F³, and set screw, F⁴, on the side frame, D. It has bellows sides, G¹, between itself and the back end of the frame, D, and it has a rigid top or cover, G, hinged at G² to the top of the frame, D. It also has a spy hole, G⁴, and a spring clasp not shown. In this case the operation is the same as that described with reference to fig. 4, and the mirror or reflector, F, is, if so desired, made to close at, and form the back of, the cavity formed in the frame, D.

In fig. 6 the angular mirror or reflector, F, is hinged inside the frame, D, at the lower part of the frame of the ground-glass screen, E, or upon the baseboard, D¹, and it has friction catches, or springs, or rollers, G⁵, on its edges, which press against the sides of the recess, D, to hold the mirror at the required angle, and prevent easy movement. The upper back of the frame, D, is hinged, as shown at G², and this upper part moves upwardly, having bellows or folding side connexions, G¹, and a spy hole G⁴. In this case, for carriage, the angular reflector is folded up against the frame, E, and is held there by the springs, G⁵, the back part, G, closing down into place.

So far as has been described, the improvements form part of, or are incorporated into, the construction of the camera itself, but they are equally as well applicable to, and may be manufactured into, a structure integral in itself, adapted to be temporarily attached to the back of a camera. Figs. 7 and 8 show in perspective two such constructions, it being understood that these may be attached to the back frame of the camera or to the frame of the focussing screen in any well-known manner by hinges, or screws, or set screws, or by grooves and buttons, and that the frame, H, of such attachment may, if desired, hold the focussing screen, and said frame take the place of such focussing screen frame.

In fig. 7, H is the front frame for attachment to the camera, and this frame may, if desired, hold the focussing screen in the usual manner on its back or on its front, and this frame may be attached to the camera in a similar manner to that in which the focussing screen frame is now ordinarily fastened. F is the angular mirror or reflector hinged at the bottom to the frame, H, and having bellows or flexible sides, G¹, between it and the frame, H. J are the side arms or frames for the top or lid of the cavity just formed. This top has a spring clasp, J¹, to affix it to the top of the reflector, F, and it has spy or eyeholes, J², on the rigid part, J³, of said top, the other part, J⁴, of said top being of flexible or textile material, so that the side frames, J, moving with their slots, J⁵, on set screws, J⁶, will allow the angularity or set of the reflector, F, to be adjusted. For carriage, it will be seen that the reflector, F, and the top may close the one upon the other.

Fig. 8 is a similar construction to that of fig. 7, differing in that the mirror, F, is supported by side bars, K, having slots, K¹, through which passes set screws, K², to the frame, H. The angular reflector, F, in turn, by means of side bars, L, supports the rigid top piece, M, hinged at M¹ to it, and having collapsible eyepiece, M². The part, M³, which reaches from rigid piece, M, to the back of the frame, H, is made of flexible and/or elastic material or fabric, so that it will allow for adjustment of the angular set of the reflector, F. Between the reflector, F, and the frame, K, are bellows sides, G¹.

Where the image, instead of being cast direct from the lens on to the front of the focussing screens is reflected by an intercepting reflector or mirror and cast on the front or inside face of a focussing screen in or on the side of the camera or relatively to the lens parallel with the axis thereof, the angularly set reflector or mirror is attached in a similar manner to those herein described, but in this case it is essential that the plane of the mirror be parallel with the axis of the lens, and the angular set must start from the lower edge of the focussing screen and incline inwardly or outwardly and upwardly.

the Waterworks Clauses Act. Mr. Lee, the Town Clerk, who appeared for the prosecution, said the maximum penalty for allowing water to run to waste was 5*l.* The waste of water in Dewsbury had been a serious matter, and four years ago an Inspector was appointed, whose duty it was to detect such waste. On June 23 last the Inspector saw the water running from the defendant's dark room. The premises were then closed for the week end, and on the morning of the 25th ult. the water was still running, and it had been allowed to run to waste all the week end. Some thousands of gallons must have been wasted. A representative of the firm was present, and pleaded guilty, saying it was through an oversight. The Bench imposed a fine of 5*s.* and costs,

A COPYRIGHT CASE.—In the Queen's Bench Division, before Mr. Justice Channell, a copyright case was decided last month. The plaintiff, Mr. George Bagshaw Bradshaw, who carries on business at High Bank Studio, Church-street, Altrincham, under the style of G. B. Bradshaw & Co., photographers, obtained a perpetual injunction restraining the defendant, Mr. James Littler, Stamford-street, Altrincham, hairdresser, his servants, agents, or workmen, from printing or producing by photographic process or otherwise, or selling prints or copies of a certain photograph of the "Amateur Naval Brigade and 4·7 Naval Gun taking part in the procession of 'Patriotic War Fund,' Altrincham, of which the plaintiff was the registered owner." The facts, which were incorporated in affidavits, showed that the plaintiff, on February 26 last, took on the Devisdale, Bowdon, on the occasion of the patriotic procession, a negative of the Amateur Naval Brigade and 4·7 Naval Gun taking part in the procession, his plate being a 12-inch by 10-inch size. He subsequently developed the negative, and produced photographs, which had a ready sale. The defendant obtained possession of one of the positives, and then proceeded to copy the plaintiff's photograph, reproducing a photograph in a smaller size, 5 inches by 3 inches, signed with his name and address. The plaintiff registered his photograph at Stationers' Hall as copyright, and the defendant subsequently sold a copy to a Miss Bacon, for which she paid 9*d.* The infringement being established, the Court, by consent, made the injunction perpetual, with costs in the plaintiff's favour, with liberty to apply for inquiry as to damages if the matter was not settled between the parties.

News and Notes.

MR. FRANK T. ADDYMAN, B.Sc. Lond., F.I.C., of St. George's Hospital has in hand for publication this autumn a volume on *Practical X-ray Work*. It will be issued by Messrs. Scott, Greenwood, & Co., 19, Ludgate-hill, E.C. Mr. Addyman will give a course of lectures on X-ray work at St. George's Hospital early next year.

THE DELAYROUZE LIGHT.—Messrs. Crayon (Limited), of 49, Brecknock-road, N., write: "Re Answers to Correspondents' address wanted, the address of the Delayrouze Light Syndicate is 28, Victoria-street, S.W. Perhaps this may help Mr. Malkin. We are using one of the Delayrouze torch burners, with which we are well satisfied."

WE have received an advance press copy of the Great Eastern Railway Company's booklet, giving particulars of new Continental tours via the Royal Mail Harwich Hook of Holland route. A sight of the little book makes one long to take advantage of the excellent facilities for reaching European pleasure spots provided by the Great Eastern Company.

THE R.P.S. EXHIBITION.—We are requested to remind our readers that the last day for the receipt of applications for space in the Professional Section and the Appafatus Section of the Royal Photographic Society's Exhibition, at the New Gallery, October 1 to November 3 next, is Saturday, July 21, after which the allotment will immediately be made.

THE Glasgow Camera Club's Annual Exhibition will be held in the rooms at 46, Gordon-street, Glasgow. It will open on Monday, November 12, and remain open until Saturday, November 24, 1900. The Judges are Messrs. J. Craig Annan, F. H. Newberry, and W. Goodwin. The following class is for open competition: Class G (any subject, any size), one silver and one bronze medal.

THE ASHTON PHOTOGRAPHIC SOCIETY'S ANNUAL EXCURSION.—The Annual Excursion, under the leadership of Dr. Hamilton (President), came off on Saturday, July 7. Lincoln was for a second time the place selected. The weather was splendid throughout the day, and the members thoroughly enjoyed their outing. As many as 342 plates were exposed, but in 1894 this was exceeded by fifty-eight.

THE *Woodbury Reproductions of Old and Modern Masters*, just issued, set forth, in a cheap handbook, many interesting particulars concerning reproductions of the chief artistic masterpieces from the world's greatest art galleries. It is illustrated with numerous reproductions of great pictures, and possesses an additional attraction in including excellent examples in carbon, Woodburytype, and colotype, depicting the processes adopted by the Woodbury Permanent Photographic Company, of Great New-street, E.C., the publishers of the work. Its price is 1*s.*

WORKMEN'S COMPENSATION.—At the Clerkenwell County Court, on Friday last, before his Honour Judge Edge, Henry George Brown sued Messrs. Fordham & Co., of 8 and 9, Lensdon-place, N.E., photographic mount-makers, to recover compensation under the Workmen's Compensation Act. It appeared that the defendants had paid 1*l.* 1*s.* into court, with a denial of liability. The applicant stated that his finger was injured whilst working a machine, and it has since lost its sensitiveness. After evidence had been given on both sides, his Honour said that he had every desire to assist applicant, but he was satisfied that he was not prevented from earning full wages. He had to guard against workmen obtaining compensation from one firm and then going to another firm and earning full wages. He would award the plaintiff 7*s.* per week from February last to June 30 last, or 5*l.* 19*s.* in all.

Studio Gossip.

A SINGULAR PROSECUTION.—Messrs. Eddison (Limited), photographers, of Dewsbury, were summoned at the Dewsbury Police Court for an offence unde

AT the Somerset Quarter Sessions, on Wednesday last, John Stuart, aged forty-two, photographer, was indicted for obtaining, by means of false pretences, from Louisa Cox the sum of 9s. in money, on March 25 last; also, on March 31 and June 18 and 19, various other sums from divers persons. The prisoner pleaded guilty. Mr. Vachell, who appeared for the prosecution, stated that the prisoner was an army pensioner, and lived at Hotwells, Bristol. He had been about the country with a dummy camera, pretending to take photographs of farmhouses, for the London Stereoscopic Company, to be used in railway carriages and for magic-lantern slides. Upon those representations, and upon a promise to send copies of the photographs, when finished, he received the various sums of money mentioned in the indictment. The Chairman said the prisoner had been guilty of a deliberate and carefully laid system of fraud, and he would be sent to gaol for eight months with hard labour.

MICROSCOPIC PHOTOGRAPHS.—“These were first originated and produced by Mr. George Shadbolt [a former Editor of this JOURNAL.—EDS. B. J. P.] then President of the Microscopic Society. ‘They were so minute as to appear to the naked eye as a mere ink-spot. I termed them ‘dot photographs,’” writes Mr. F. H. Wenham in the *English Mechanic*. “I have specimens in my microscope cabinet of the portraits of several esteemed friends (all since deceased), and also some buildings, the details of which, under the microscope, are quite visible. They were taken by the wet-collodion process, which in itself has a structure apparently coarse under high magnification. With the modern instantaneous process and dry films better results could be obtained. The subject appears to be forgotten; but, on account of its undoubted utility, I should be glad to see it revived, for where secrecy is desirable the camera could be disguised as an ordinary snuff-box. The lens, of course, would be a perfectly corrected micro-objective.”

THE PRESENT POSITION OF RÖNTGEN-RAY WORK.—At the recent meeting of the Röntgen Society, Mr. Wilson Noble, in the course of his presidential address, said no very striking discovery with regard to the rays had to be recorded, but a steady improvement had taken place in general practice. It was now possible to shorten exposures, and to get far better definition, both in scograms and on the screen. In the latter case there was much greater clearness, and, what was of even more importance, an absolutely steady image. It was also possible to localise foreign bodies with certainty, and the importance of stereoscopic radioscopy, seeing objects in relief on the screen, was an accomplished fact. There were many things difficult to see, or, at all events, to distinguish with certainty, when seen as a flat surface, but which came out with wonderful clearness when seen in relief. One had only to look at an ordinary stereoscopic slide, first without and then with a stereoscope, to appreciate this. More particularly was this the case with objects showing but little contrast, and ill-defined, such, for instance, as the early patches of tuberculosis in the lung. He could not but think that the diagnosis of this disease would be enormously facilitated when stereoscopic radiography became general. Many minor improvements had been brought before the Society during the past year. One noticeable feature of the present practice was the adoption of the influence machine by many workers. It was too soon to say whether that machine would ever supersede the coil. In South Africa the rays had rendered admirable service. It was a fortunate circumstance that the work for which they were most wanted on the battlefield—*i.e.*, for the localisation of foreign bodies—was the easiest to perform, for the employment of the rays anywhere than at a well-appointed base hospital was accompanied with enormous difficulties. The number of cases constantly coming in, the necessity for hurrying through them, and the constant impossibility of keeping the tube in good working condition, the difficulty of charging the accumulators, and many other serious inconveniences, made it a marvel how any satisfactory work could be done.

Commercial Intelligence.

WE are informed that Major-General J. Waterhouse has joined the Board of the Britannia Works Company (Limited).

MESSRS. ARCHER & SON, of 71-73, Lord-street, Liverpool, have had the word “Optic” registered as their telegraphic address.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to the Rev. W. T. Reeder, The Vicarage, Carlton, R.S.O., Yorks.

MESSRS. B. J. EDWARDS & CO., LIMITED.—We are pleased to find included in the list of Limited Companies registered during the past week the name of our old friends Messrs. B. J. Edwards & Co., the well-known manufacturers of isochromatic plates, &c., who will in future carry on the business under the title of B. J. Edwards & Co., Limited. We learn, on inquiry, that Mr. B. J. Edwards will still retain his interest in the new firm, and that associated with him in the management will be Mr. Roland Stone, son of Sir Benjamin Stone, M.P., the well-known amateur photographer. The firm will shortly remove their factory to new and commodious premises at Ealing, and, as the new works will be fitted up under the personal supervision of Mr. B. J. Edwards, it is certain that every possible facility will be secured for the manufacture of the highest class of goods. The latest and best appliances will be used throughout, including Mr. B. J. Edwards’s patent coating machine, which has already been adopted, not only by the most important firms in Great Britain, but also in Germany, the United States, and elsewhere. In addition to this are other improvements, &c., of more recent introduction, including a machine for cleaning and preparing the glass previous to coating. By this new method the plates are not only rendered chemically clean, but they are also coated with a substratum which effectually prevents all chance of frilling, so that in this respect the new Company starts with an important advantage.

THE BRITISH MUTOSCOPE AND BIOGRAPH COMPANY (LIMITED).—At the Ordinary General Meeting of the shareholders of this Company, held at St. James’s Restaurant, Regent-street, under the presidency of Mr. Snedle the Chairman, in moving the adoption of the report and accounts, said that had sent out to South Africa, at a very considerable expense, a number representatives to take views of the war. As a result, they had received some very excellent views, some of which had never been taken before under similar circumstances. The Company’s operators were under fire at the batt of Colenso and elsewhere. Notwithstanding the whole of that expense the average price of negative films had gone down about fifteen per cent during the year. Their positive films, those used in running the biograph had gone down fifty-five per cent. per foot, which was less than half that at which they stood at the beginning of the year, and was even less than the cost price of the films. That had been brought about by their doing business with other companies. When they received the films from South Africa, they were developed for this Company, and additional positives of the films were sold to companies in other countries at a very handsome profit. During the year the had purchased the patent rights of the automatic banjo and other machines for £1,649. The automatic banjo was one of the most successful venture they had at the present moment, and was earning a handsome dividend on their entire capital. The biograph had a competitor in the cinematograph but he believed he was right in saying that the cinematograph could not show pictures such as they exhibited, especially as regarded size and steadiness. Their negative was from seven to nine times as large as that of the cinematograph, and was run at a much greater speed. The records of their pictures which were accumulating, were, of course, of the greatest value. It was astonishing how prominent men in all countries willingly lent themselves to be photographed for the biograph and mutoscope. The German Emperor had been especially good in this respect. He thought the time would come when their war pictures taken in South Africa would be of great value, and the negatives would be, he was going to say, beyond price. They had mad arrangements for representatives to go to the seat of war in China, and the pictures obtained there would be of great value. Some people thought the mutoscope a novelty that would go off, but that was not his view. The novelty of the mutoscopes had worn off to some extent, but not the novelty of pictures which would become of greater interest as time went on. No doubt, the novelty of the illustrated newspaper had worn off years ago, but the selling power of illustrated newspapers had not been reduced, but was increasing. The thirst of the public for illustrations was increasing, and the thirst for moving illustrations was also growing. The difficulty was to find some mean for the mutoscope to be under the control, and within reach, of the public. If an illustrated newspaper could be produced by which the public, as they turned over page after page, could see a moving picture of events, they would probably buy that journal, and no other. The Company was now introducing the display mutoscope, which formed an excellent means of advertising. The Company had taken a studio, where they were able to take moving pictures at any time of the day or night, and he believed the effect of that would be that within twelve months it would be the rage to be photographed in a moving position. They were also introducing “The Home Mutoscope,” for which small rental would be charged, and a change of reels would be sent to the user every week. They had also secured a new system of photographing porcelain, which was absolutely different to anything which had hitherto been introduced in that line, and the photographs would be of permanent character. He had the fullest confidence in the future of the Company, and he believed they would maintain a ten per cent. dividend, and improve the business year by year. The motion was seconded and carried unanimously, and the proceedings, after a short discussion, were concluded.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
23.....	Southampton	Retouching. A. Freeman. The Pictures taken in Competition by Members at the Cannock Excursion will be on view, and the Judges’ Awards made known.
24.....	Birmingham Photo. Society	Warm Tones on Velox. Donald C. Nightingale.
24.....	Hackney	Excursion: Carshalton. Leader, F. W. Levett.
28.....	Borough Polytechnic	Excursion: Gatton Park and Hall.
28.....	Croydon Camera Club	Excursion: Chipstead and Neighbourhood. Leader, G. Moore.
28.....	Croydon Microscopical	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 12.—Mr. T. E. Freshwater in the chair.

Mr. PHILIP EVERITT showed a photographically corrected magnifying pocket glass made by Steinheil, and magnifying twelve diameters. It consisted of three lenses cemented together, and was remarkably flat of field although the field was not very large. It was a vast improvement upon the ordinary pocket magnifying glass.

Mr. J. E. HODD showed several photographs of the recent partial eclipse taken at Balham by Mr. G. H. Gill. Plates of several makers were used—the Sandell, the Warwick, and the Chromatic plate, all with yellow screens, and the exposures varied from one-sixtieth at f/22 to one-half at f/16, most of them being at f/16. The time was from 3.20 p.m. to 3.43 p.m. In two of the plates the Chromatic at one-fifth second and the Sandell at one-half second, the sun’s image was reversed, the print showing a negative image. There was an additional point of interest in a thin white line which surrounded the reversed

image in one of the pictures, the cause of which it was desired to ascertain. "Halation," and the well-known fact that a high light in juxtaposition with a shadow gave this effect sometimes, were mentioned in explanation, but the point was one not easy to settle. The six prints were examined with considerable interest.

Mr. EVERITT said he had a photograph of the eclipse taken with a four-inch telescope, the image of the lens measuring three inches in diameter; also one lone with part of a R.R. lens of eleven inches focus, the image being about one-tenth of an inch across.

PHOTOGRAPHIC CLUB.

JULY 4.—Mr. J. W. Zaeheinsdorf in the chair.

Mr. J. W. MASON, on behalf of Messrs. Newman & Guardia, showed the new Nydia camera, a pocket folding camera, taking eight plates or twelve films in sheaths, and in a changing box which really formed part of the camera. The shutter was seen to work without hitch or jar of the slightest description up to one-hundredth of a second, and the sheaths and changing mechanism were of effective and simple design. The workmanship is characteristic of Newman & Guardia's productions, and the camera was thought to be a very creditable piece of apparatus.

The CHAIRMAN said that, with reference to iron specks in papers, which, of course, were in the highest degree detrimental to photographic pictures, from an examination of some old books dating back to 1800, he thought he had traced the trouble to iron specks from the rollers rather than to the iron present in spring water. The iron had oxidised in the paper, and produced a network of peculiar lines. He could not imagine that the mere trace of iron in spring water used for paper-making could be enough to cause trouble.

Mr. E. W. FOXLEE believed that the same defect in paper might be attributable to the "devil," the instrument used to tear up the rags, &c., from which the paper was prepared. Particles of metal from this got mixed up with the pulp, and the same with any metal buttons on old linen which might get overlooked.

Mr. FOXLEE showed some further tests with old kachin developer kept for some thirteen or fourteen months. In the intervening period he had made several trials of the old used solution, and some of them have been shown. The two negatives taken together in a bi-lens camera, and shown, were developed, one with new solution, and one with the old stock. Apart from the fact that the old solution required for complete development sixteen minutes to four and a half minutes with the freshly made solution, there was no practical difference. Opinion was evenly divided as to which was by the old and which by the new developer, and Mr. Foxlee himself confessed that only by a private mark could he tell.

The rest of the evening was devoted to an attempt to solve a question put by Mr. Müller, viz., given a plate correctly exposed, and requiring to reduce the whole of the light-struck silver bromide, would it matter what developer was used?

Mr. J. W. MASON was convinced that, in the first place, what might be a correctly exposed plate with one developer would not with another.

Mr. FOXLEE believed there were many who held that so-called tinkering with the developer had very little to do with the ultimate result, but he thought it did. Theoretically, perhaps, any of the developers should thoroughly reduce the exposed bromide of silver; but, when one was dealing with a negative from which a print was required, other factors came in, and the matter resolved itself into a different one altogether. He believed that the thinner the film, provided one gave correct exposure, one more nearly approached the condition of things suggested by the original question.

Mr. MÜLLER defined what he considered a correct exposure in the case of a sheet of print as one which allowed the maximum of action by the white parts of the paper without permitting the black points to influence the paper.

FORTHCOMING EXHIBITIONS.

1900.

August 21..... Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.

Sept. 21-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.

October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.

November 12-17 Ashton-under-Lyne.

,, 21-23 Hackney Photographic Society.

1901.

January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE TANQUEREY PORTRAITS.

To the Editors.

GENTLEMEN,—As you will see from the enclosed, which I have received by post from Paris, the enlargement swindle is not confined to England only. Both the first and the second letters are cunningly written, with the aid of English press cuttings to deceive the English public. I thought you might like to warn the public.—I am, yours, &c.,
Graphic Works, Tunbridge Wells, July 9, 1900. CARL NORMAN.

[We have been warning the public for years against the methods of Mr. "Tanquerey," and, indeed, scarcely a week passes without we receive a batch of his literature. The British postal authorities hold the only key which would lock the door on Mr. "Tanquerey," but they refuse to turn it.—EDS.]

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Apropos of your remarks under Ex Cathedrâ in the JOURNAL for June 29 on the introduction of figure models into stereoscopic work, and the pleasing and interesting effects they may be made to produce when artistically posed and arranged, I send you, for inspection, a set of six slides representing the six acts in *La Dame Blanche*. These slides were purchased by me many years ago, some time after the first Paris Exhibition. They are transparent and are coloured at the back, and, when viewed in the stereoscope by transmitted light, the scenes are most lifelike, and the stereoscopic effect perfect. Whether the figures are living models or mere dolls I am unable to determine; it has always been a puzzle to me. If the latter, I can understand them being taken with a single camera and lens, on the Latimer Clarke principle, which was the method in use in those days; but, if the former, that is, taken from life on the stage of a theatre at a matinée or a rehearsal, it is difficult to conceive how the scenes could be so well lighted, and how the living figures, especially in the ballet scene, could maintain their position long enough to enable the operator to take the photographs.

It is possible you may have seen similar slides before, but they are unique in my experience and very interesting. I regret that two of the slides are damaged, but I think they can be put right with a little transparent parent glue.—I am, yours, &c.,

Tho. MITCHELL.
Ffynonau, Harrow-road, Newport, Mon., July 11, 1900.

[We are much obliged to Colonel Mitchell for sending us the set of Paris theatre slides, which we have returned to him. The figures are life models, which, we should imagine, were posed against scenery placed in the open air.—EDS.]

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

W. J. Anckorn, 12, West Port, Arbroath, N.B.—Photograph of Rev. G. K. Cuthbert.
W. Fisher & Sons, Rutland-street, Filey.—Two photographs of the Rev. J. Stalker, D.D.
E. G. Brewis, 8, New Bridge-street, Newcastle-on-Tyne.—Two photographs of G. W. Waller.

PYRO-ACETONE.—A. M. Z. asks for a formula for a good two-solution pyro-acetone developer for negatives.—You will find the formula, with instructions for use, on p. 1072 of the ALMANAC.

ADDRESS WANTED.—LENS writes: "Could you oblige me with the address of Darlot's, optician, London?"—So far as we are aware, there is no Darlot, optician, London. Darlot's address is 125, Boulevard Voltaire, Paris. Shew & Co., Newman-street, W., are the London agents.

DIRECTORY OF PHOTOGRAPHERS.—ACCO asks if there is any book published containing the names and addresses of all the photographers in the United Kingdom.—In reply: Messrs. Percy Lund, Humphries, & Co., of Bradford, publish a directory of photographers, price, we believe, 7s. 6d.

COLLODION.—W. MINNS. The plate arrived broken; but, by putting the pieces together, we can see there is no fault with the collodion itself. The streaks are due entirely to the coating. The plate was not properly rocked as the collodion was poured off, so that the film became equalised.

DESCRIPTION OF PRINT.—A. VIVIAN writes: "Would you be good enough to tell me by what process or paper the enclosed print is produced? By so doing you will greatly oblige."—It appears to be an ordinary bromide print on glossy paper. What brand we cannot say. Similar results may be got on Velox and suchlike papers.

RIGHT TO THE NEGATIVE.—SAWBONES. With all deference to the opinion of your solicitor, the negative does not belong to you, but to the photographer. That point has been settled over and over again in Court, and that you will find out if you proceed with the summons. We fancy your solicitor is not well posted up in what has gone before.

MEALY PRINTS.—S. BARROW says: "I have been trying the acetate toning bath with albumen paper, and all the prints turn out like the three I have sent you. Can you tell me the reason?"—Evidently the toning bath was used too soon after it was made. This bath should be made up about twenty-four hours before it is used to get the best results.

GELATINE versus COLLODION.—J. R. SIMES asks: "Will you please tell me how much slower a wet-collodion plate is than a gelatine one?"—This is really a ridiculous question, seeing that some gelatine plates are very many times more sensitive than others, and wet-collodion plates vary in sensitiveness according to the collodion and the condition of the bath.

VALIDITY OF AGREEMENT.—S. S. S. According to the wording of the agreement, several knotty points might arise in Court, therefore we should not like to give an opinion. We should advise you to submit it to a solicitor before taking any action in the County Court. In fact, we are not sure if it would be a County Court case at all; we rather suspect it would be a case for a higher Court.

LENS.—WARDER says: "I have bought, at a pawnbroker's, a portrait lens bearing the name of M. P. Tench, Fleet-street. It is three and a half inches diameter and about ten inches focus, and it wants some repairs. I cannot find the maker's name in the *Post Office Directory*, and he is not now in Fleet-street. Can you give me his address?"—Mr. Tench has been out of business for some years now.

DISCOLOURED PAPER.—T. WICKS writes: "I have bought, as a 'job line,' several gross of P.O.P., cabinet size, but I find it is all a little off colour, like the piece I am sending you. It prints all right. Can you tell me how I can get pure whites in the toning?"—No, we cannot. The paper has become spoilt by long keeping. You say it is a "little off colour"; we should say it is very much so. It is quite useless, except for the residues.

RAPID FIXATION.—"HYPO" asks: "Can you tell me of anything that will instantaneously fix a dry plate, acting the same as cyanide of potassium does on a wet-collodion plate?"—There is no such thing as an instantaneous fixer for dry plates. Cyanide of potassium does not fix collodion plates instantaneously, though it fixes them very quickly if the solution is strong; but, if it is used strong, it is very liable to injure the delicate tints of the negative.

REGISTRATION.—"COPYRIGHT" asks for "The address of the registration offices, and the terms applying to photographs and printed matter. Is the charge the same for both, or is it a different scale for the latter?"—Stationers' Hall, off Ludgate Hill. In the case of photographs, the registration fee is one shilling. In the case of books, no registration is necessary, but a certain number of copies for the different libraries, British Museum, Bodleian, &c., must be deposited.

MAGNESIUM RIBBON.—A. W. asks for "The best system of using magnesium ribbon or powder for taking a large group in a hall or studio. I have used some flashlight lamps, but they do not give the same brilliancy as the ordinary ribbon. I wish to know the best mode of using the ribbon so that a good even light could be got."—If you desire to employ ribbon, the best way will be to use several ribbons slightly twisted together, so as to increase the light. In the case of large halls, several strands might be used in different parts of the hall.

DEFECTIVE PRINTS.—W. MURRELL writes: "Will you be kind enough to criticise the two photographs sent? No. 1. Group, light coming from the side, but blocked out with curtains; on the other side, white-washed. The eyes seem to glare; is it the fault of the whitewash being too white? Please find all faults."—The photographs show that the figures were lighted by far too much direct front light. The single figure was similarly lighted, and the negative appears to be badly fogged. Stop off the direct front light, and use a side front light.

PHOTOGRAPHING FURNITURE.—J. & H. write: "We expect to have a commission to photograph, for the manufacturer, a number of articles of furniture to illustrate a new catalogue. Will you please give us a hint as to how to combat the high gloss upon it?"—As you are to do the work for the manufacturer, get him to let you take the negatives before the articles are polished, but after they are glass-papered up for the polisher. If you explain to him that you can get better results when the work is at that stage, he will be pleased for you to do it while in that state.

GASOLINE, &c.—A. H. K. asks "where gasoline can be obtained, and whether a fifteen-inch or sixteen-inch roll burnisher heated with gasoline heater would be a success. Are there any good roll burnishers successfully heated with spirit, large size?"—We suspect you will have a difficulty in getting gasoline, as, owing to its dangerous nature, there are great restrictions on its carriage. We do not know the address of any makers of it. Probably some of the wholesale dealers in oils would procure it for you. Yes, up to the size you mention, but the larger sizes are usually treated by gas.

BACKGROUND PAINTING.—BACKGROUND WRITES: "Can you kindly give directions for background painting in distemper, or refer me to a reliable handbook on the subject?"—We cannot afford space in this column to give such directions as would be materially useful for painting backgrounds. Distemper colour, however, is made by mixing whiting, lampblack, or other colours, with size and water in such proportions as will yield a thin, tremulous jelly when cold. The colour should be applied in this condition. There is no handbook published on the subject that we are aware of.

STUDIO-BUILDING; LENS FOR HAND CAMERA.—B. W. C. writes: "1. Can you tell me of a work on studio-building? I am thinking of putting one up, and should like a hint or two. 2. In substituting a double combination lens for a single in a hand camera, how shall I tell the distance to fix it from plate?"—1. Mr. Bolas's work on the subject published by Marion & Co. 2. The lens must be fixed at its focus whatever that may be. Place a piece of ground glass in the place of the prepared plate, and adjust the lens so that the image is perfectly sharp upon it. Then fix it there, supposing it is a fixed-focus camera.

SPOTS ON PRINTS.—VANDYKE writes: "I enclose a print, which, you will notice, is covered with spots. They have been a great trouble to me. I have tried various remedies, and have got all my solutions between 60° and 70°, clean dishes, &c., and then they show. It does not matter whether the paper is new or old, they appear just the same. I have used the albumen paper before, but never got into this trouble. For your opinion as to the cause of the trouble I should feel greatly indebted."—The spots appear to be due to air bubbles on the paper while in the fixing solution. Apart from the spots, the print is nearly fixed. Use a stronger fixing bath and allow a longer time in it keeping the prints in motion all the while. The print forwarded shows great want of care in the manipulations.

A QUESTION OF COMPENSATION.—G. F. writes: "Your advice on the following will oblige. I ordered a photographic studio from a well-known firm that manufacture them on June 1 of last month, and the firm stated, in their letter before I ordered the studio, that they could have a photographic studio ready for me in about fourteen days. I forwarded the order, and enclosed cash, on June 1, and told them to let me have it in the time mentioned, as I require it urgent, and it has not been sent yet. Can I claim compensation for the time lost through starting my business here, now three weeks and a half over time, and cannot commence without studio, and have to turn people away through not having studio ready?"—Under the circumstances, we should say that an action for damages could be sustained; but, before commencing one, we should advise you to consult a solicitor.

VARIOUS QUERIES.—A. H. BOULTON writes: "1. What is the best tint, and that which is preferred by the printers to work up photographs on machinery, &c., in water-colour for half-tone blocks? 2. What is the best way to make the water-colour 'take' to the paper? Is there an medium to take away the greasiness? 3. How shall I obviate marking on negatives which come during development? I trace them to the alum bath. The alum seems to eat into the gelatine surface, and score and marks it all over, almost spoiling the negative for printing. Is this due to the hot weather, or is it likely that my alum bath is too strong. It is according to the Ilford directions."—1. Usually black is preferred. 2. Wash the surface over with very diluted ox-gall, as sold by artist colourmen. 3. Probably the trouble arises from the plate not being sufficiently washed before it is put into the fixing bath; if so, the remedy is obvious.

LOST FILMS: A QUESTION OF LIABILITY.—LIABILITY writes: "An amateur left thirty Bullet-size films with us to be printed. We sent these to a trade printer, who has failed to return them, and suggests his messenger boy lost them in bringing them to us; but the boy can't remember, or won't, what he did with them. Our customer is furious, and, after threatening to do us all the harm he can, rushes to a solicitor, who writes to us demanding the films in three days, or, in default, the sum of 10L, as the subjects are foreign scenery. We wrote asking for more time, and suggesting non-liability as the custom of the trade. We have printed at the foot of our list, as every other dealer, that we cannot accept any liability, &c. 1. Are we liable? Would the custom of the trade hold good? 2. If liable to the customer, is the trade work liable to us? 3. The films were fourth-rate; is not the amount absurd? 4. Would it not be as well to have a combine to take up a matter of this sort, as every dealer is liable to having an amateur placing an absurd value on his negative, while the same, as in this case, is of no use whatever, except as a souvenir to the owner?"—1. We are inclined to think that the notice printed at the bottom of the price-list would not apply in such a case as this; it is understood to apply to negative broken or lost in transit through the post to or from the customer, or broken in printing, and not when they are sent to a third party without the customer's sanction. 2. Yes. 3. We should say, as the negative were of foreign scenery, the claim is moderate, it being less than 7s for each negative; and, of course, they could not be retaken for anything like that sum. Under the circumstances, it is not at all surprising that the customer is "furious." 4. That is a matter for the consideration of dealers; we can offer no opinion on the subject.

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EX CATHEDRÂ.

WE are very pleased to learn that the two new sections of the Royal Photographic Society's Exhibition, which opens on October 1st next, at the New Gallery, Regent-street, W.—those in which general professional work and non-competitive exhibits are admitted—have been exceedingly well supported by those in whose interests these subdivisions were made. Apparatus makers and others have taken up the whole of the space allotted to this kind of photographic production, and in the general professional section many eminent firms of enlargers and others have come forward. The support of the professional photographer—the “bread-and-butter man”—is not so great as there was every reason to hope it would be; but this may be due to the fact of his omission to realise that he should have applied for space by Saturday last. Still, we suppose that if he comes forward by the dozen, or the score, during the next few weeks, he will not be denied the opportunity of showing his photographs under their proper classification. All things considered, the first exhibition in the New Gallery, which the President of the Society, Mr. T. R.

Dallmeyer, will open two months hence, bids fair to be very large and varied. By the way, all our readers will learn with regret that the Past President of the Society, the Earl of Crawford, has lately been ill, and has been obliged to go abroad. It is to be hoped that the noble lord will speedily regain his health.

* * *

THE name of Professor Nipher has recently been tacked on, many times, to the record of some experiments connected with reversed images on gelatino-bromide plates. As it has not been quite clear what the Professor has aimed at or succeeded in doing, we have refrained from noticing the matter. To last week's *Nature*, however, the Professor, writing from St. Louis, sends a letter, in which he says that he “has shown that a plate which, on account of over-exposure, will develop as a zero plate in a dark room, will develop as a positive in a light room. The paper contains a half-tone reproduction of a positive obtained by a camera exposure of one minute, and developed within a few inches of a sixteen-candle incandescent lamp. The plate was an instantaneous Cramer plate. Since that time the same results have been reached by first opening up the plate-holder and exposing the film to the lamp-light until it is all converted into the zero condition. If covered with an opaque punched stencil, no trace of the design will appear on the film when developed in the illuminated bath. The slide is then closed and the plate afterwards exposed in the camera in the usual way. Such a plate cannot be over-exposed in any reasonable time. It may be exposed for a minute or for four hours to a brilliantly lighted landscape, and the most superb results can be obtained. There is no restraining developer needed. The tendency to fog when the exposure is too short is corrected by taking the developing bath nearer to the light. It seems probable that on very short exposures it might sometimes be advantageous to use a developer which will yield a positive with an under-exposed plate. In the two eclipses of long totality which are now [June] approaching this method seems to promise very valuable results, and the attention of those who will have the work in charge is earnestly directed to this matter. The results described have been reached but recently, and there is need of preliminary experimenting by any one who wishes to avail

himself of these methods." We have successfully experimented in the phenomena of reversal by making positives from positives and negatives from negatives, but we have made no observations as to the influence of the developing light. Some amount of incompleteness strikes us as characterising the Professor's experiments; however, those of our readers interested in reversal may like to be placed in possession of his ideas. The last line of his letter is probably exceedingly true.

* * *

THE Pan-American Exposition, to be opened at Buffalo on May 1, 1901, is already receiving notice in our Transatlantic contemporaries. Mr. J. V. Noel, in *The Professional Photographer*, tells us that it "will afford a splendid opportunity for interesting work to those lovers of photography who will be able to attend this great educational event. The artistic arrangement of the entire plan of the buildings, the beautiful gardens with their foliage of both temperate and tropical zones, and the wealth of architectural beauty in the buildings of the Spanish Renaissance style, will all give the intelligent photographer vast scope and innumerable opportunities for the development of the artistic appreciation of his surroundings. In and about the lakes, near the canals, where gaily bedecked boats and gondolas will glide, in the park itself, striking views will be taken by those who see a line of beauty in every ripple and in every twig and leaf." The article from which we quote is illustrated with views of the chief buildings to be erected, and Mr. Noel urges photographers not to miss the opportunity held out to them of using their cameras at the Exhibition. They will be asked to pay a tax of fifty cents a day for the privilege of taking views on the grounds with photographic apparatus carrying plates not larger than 4×5 inches, or at the rate of \$1.50 per week. The photographer is advised not to bring his tripod to the grounds, for its usage will not be permitted. Large and convenient dark rooms will be provided by the official photographer, Mr. C. D. Arnold, at the free disposition of all, and for their special convenience, plates and films will be sold at the usual rates. We do not suppose that many of our readers will visit the Pan-American Exposition, but they may be interested in knowing that photographers there are limited to the use of cameras not exceeding 5×4 in size, at an approximate charge of 2s. a day, or 6s. a week. It is amusing to note the dread of the tripod in the grounds, especially as 5×4 is the maximum size allowed. The official photographer apparently hopes to make money in two ways—by photographing large direct views himself, and selling plates and films to those whom he limits to snapshot work. He seems to be a very shrewd person.

* * *

THIS week the annual meeting of the British Pharmaceutical Conference has been held in London under the presidency of Mr. E. M. Holmes, F.L.S. A glance at the programme shows that pharmacists in their yearly peripatetic gatherings occupy themselves much in the same manner as photographers who attend the Convention. A presidential address, receptions, the reading of papers, excursions, a concert and dance, a garden party, and a photographic group were the principal items in the proceedings of the Pharmaceutical Conference, which is now in its thirty-seventh year. From what we can gather, the Conference, though largely composed of members of the Pharmaceutical Society, has an entirely separate organization. It is twenty-four years since it last met in London.

The meeting occupied four days, and if the programme was carried out in its entirety, a great deal of work and pleasure was got through in the short space of time at the disposal of members. For a society of this kind, which, we suppose, has no permanent home, thirty-seven years is a long life, and it goes to show that, if properly directed, pleasant annual reunions of the kind which so frequently take place in the summer and autumn, may easily retain the uninterrupted favour and support of those on whose behalf they are held. We hope the members of the Pharmaceutical Conference had a pleasant meeting.

* * *

THIS week, too, the twentieth annual Convention of the Photographers' Association of America is being held at Milwaukee. Here is an outline of the proceedings:—Monday, July 23: Art Hall open to exhibitors to permit them to drape or readjust their pictures.—Tuesday, 24: Opening of the Convention. Address of welcome by Hon. D. S. Rose, Mayor of Milwaukee. Reading communications. President's address. Reports of committees. "Progress of Photography," by W. I. Scandlin. Lecture by Professor O. W. Beck. Subject: "What are the Principles of Beauty in Art?" Demonstrations of the MacDonough process in colour photography. Theatre party by special invitation of the Wisconsin State Association.—Wednesday, 25: Reading communications. Treasurer's report for 1899. Secretary's report for 1899. Copyright question of to-day by B. J. Falk. Appointment of Committees on nominations. Routine business. Lecture by Professor A. H. Griffiths. Subject: "Topics of Interest and Value to the Photographic Profession Generally." Reports of committees. Informal discussion. Layton's Art Gallery. Lecture on the art works in the gallery by Professor C. E. Eldridge. Grand summer night concert at the Deutscher Club by special invitation of the Club.—Thursday, 26: Reports of committees. Selection of next place of meeting. Nomination of officers. Election of officers. Lecture by Professor O. W. Beck. Subject: "Does Lighting Insure Art?" Demonstration of the Ives-Kromskop process in colour photography. Excursion to Whitefish Bay.—Friday, 27: Unfinished business. Lecture by Professor A. H. Griffiths. Awarding of prizes. Adjournment. Grand excursion on Lake Michigan on Crosby line steamer.—Between the American Convention, the British Pharmaceutical Conference, and the British Photographic Convention there appears to be a strong resemblance at all points. And the youngest of the three institutions is not the least successful or deficient in strong prospects of a long and useful career.

* * *

THE *Cape Times* of June 19 publishes a detailed description of the Imperial Yeomanry Hospital, which has so nobly ministered to the needs of suffering soldiers at the front, and, in the course of the article, it states that the most valuable special department has been the X rays; this is under the skilled management of Mr. Hall-Edwards, Radiographer to the Birmingham General Hospital. Owing to his skill, many bullets have been not only discovered but also precisely located, and their removal by the surgeons thus facilitated. The exact fracture in doubtful cases has been shown, and, in consequence, any incorrectness of position has been avoided in the setting of them. The sanitation of the camp has been most carefully and satisfactorily worked out under Mr. Barclay Black's guidance; there is a sergeant, a corporal, and thirteen

natives perpetually at work in this department alone. We are pleased to read that Dr. Hall-Edwards's services at the hospital have been so freely recognised. He has steadily devoted himself to radiographic work for the last four years, and we do not doubt that the accumulated experience he has gained at home and abroad renders his services simply invaluable in difficult surgical cases. In the recent discussions that have taken place in Parliament and the Press relative to the alleged hospital mismanagement in South Africa no suggestion has been made that the radiographic service has not been maintained at a point of the highest efficiency. On the contrary, from all sides we hear the most gratifying tributes to the excellent way in which radiography, on its first field of war, has assisted the army surgeons in their humane work.

* * *

ON the occasion of the visit of the Duke and Duchess of York to Bognor on July 9, for the purpose of opening a new Convalescent Home for Women, the address of the Urban Council to their Royal Highnesses was prepared by Mr. W. P. Marsh, the well-known photographer, a member of the Council, and one of our readers for thirty years. Mr. Marsh has kindly sent us a photograph of the address, of which the *Sussex Daily News* gives the following detailed description:—"Mr. Marsh conceived the idea of representing the prawn and lobster fishing industry of Bognor in the many embellishments which surround the text of the address, which bears illustrations by Mr. Marsh. Surrounding the text appear the following enrichments:—On either side, a broad column of matt gold, supported at the base on the right-hand side by an artistically arranged group of lobster and prawn pots, seaweed, lobster and crab, fisherman's jack-boot, boat-hook, oar, sail, and net. At the base of the left-hand column, representations of sea-shells, sea-weed, and prawns. The upper portion of the columns was entwined with the White Rose of York, while the ornamentation at the top of the address consisted of a very beautiful and effectively worked-out design in ears of corn, intermixed with cornflowers and other wild flowers, over which appeared a design of two large sea-gulls with outstretched wings. The embellishments at the foot of the address represented the bottom of the sea, with various coloured sea-weed, shells, &c. Surmounting each of the views was a filagree design, surrounded with an arrangement of sea anemones, starfish, shells, and seaweed. A shield bearing the arms of West Sussex in blue and gold ornamented the top left-hand corner. The text of the address was illuminated in gold and colours, and the whole of the work was hand-painted." If we may judge by the photograph, the address was strikingly elaborate and beautiful. To the best of our knowledge, no photographer has before had the honour of preparing a Royal address. Certainly Mr. Marsh put a remarkable wealth of ideas into the Bognor address, and we heartily congratulate him on his work.

MUCH-NEEDED IMPROVEMENTS.

IRIS DIAPHRAGMS.

THERE has been of late years great discussion upon the alleged superiority of American manufactures over British manufacturers generally, as well as those specially pertaining to photographic work; but, like discussion on many other questions, it is not capable of a simple conclusion. Of the inventiveness of American mechanicians there is no doubt. Not to go outside

our own province of photography, it cannot be doubted that many important improvements in apparatus have emanated from the United States, and have been adopted here; yet there will be few, if any, to gainsay our assertion that, when we desire to obtain a camera, for example, of the highest quality of workmanship, a British-made one will surpass that of any make in the world. In this very point, we believe, lies the crux of the whole problem. We go on the lines of bringing to perfection any existing patterns; we add minute details of improvements, but are prone to be content with the pattern as a whole, and to go on making it for years, with the assurance that no one can produce it of better construction. Our competitors, however, are less content to rest on their oars. A demand may arise either from within or without, and, if it seems probable that sales may result, some maker will throw his manufacturing plant on one side, and erect fresh for making the newly devised product. The net result here is a general tendency to conservatism as to patterns, though we are ready to admit that some portions of the vast strides in the manufacture of photographic apparatus that have actually taken place are due to the initiative of our own manufacturers. It is not long since we called attention in these columns to a much-needed addition to all cameras—the application, to every camera made, of some form or other of a light, portable, easily adjustable sun-shade. So far our words have fallen upon unheeding ears, but we are certain that some day, when the right pattern shall have been devised and then properly brought forward, portable "skyshades" will become a veritable boom.

Turn we now to the iris diaphragm, and its capability of improvement, and we may say, *en passant*, that this particular piece of apparatus forms a conspicuous example of the conservatism we refer to. There is a general impression that iris diaphragms are quite a modern invention, as applied to photographic lenses; but it is an entirely erroneous one, for we ourselves have seen, between thirty and forty years ago, a lens with an iris diaphragm similar in all essentials to those now made. Almost every lens of modern construction is fitted with contracting and expanding diaphragm, yet the knowledge of the existence of so valuable an adaptation virtually lay dormant for nearly a quarter of a century. It is true that there are photographers who prefer the older kind of stop, but the general consensus of opinion is more favourable to the iris, which, to use an expressive Americanism, has come to stay.

The mechanism of the diaphragm has been brought to beautiful perfection, the movements of one in a first-class lens being a marvel of apparent simplicity and smooth working; yet, notwithstanding that it has now been in use for about a dozen years, there is in one direction a crying need for alteration in the instrument. We refer to the mode of placing the figures representing the intensity ratios upon the tube. In ninety-nine cases out of a hundred they are simply engraved upon the tube itself, a position which would naturally suggest itself when the apparatus was first devised. As a matter of fact, however, this is a vicious principle, and it is the purpose of our writing to indicate, in the strongest manner possible, the urgent need for alteration in this direction.

As an example of what we wish to see altered, one instance alone out of many similar ones that occurred at the recent Photographic Convention, will exactly illustrate the point. When in Durham Cathedral, a lady asked us if we could oblige her with a match, as she could not read the numbers of the iris stops. The camera was awkwardly placed and difficult to approach. In actual practice it is frequently similarly placed,

when the diaphragm numbers as now marked cannot be read. If, however, they were placed on a projection or rim, at right angles to the lens tube, and facing the front, the numbers could be read with ease, however awkwardly situated the camera might be, and we fervently hope that before long there will not be a lens made with the tube marked in the old way. It is a very simple matter, and the most singular thing is that there have been a few lenses made for some time with the figures displayed in the manner we indicate. No one but the photographer whose work carries him into all kinds of places, in all kinds of light, has any conception of the impossibility at times of reading the scale numbers. This is no imaginary grievance, but a real and trying difficulty, too frequently accompanied in practice with a regrettable strength of language, and the difficulty is increased by the usual way of fixing the lens, the scale being placed on the part of the lens that is uppermost when the lens is screwed home. The scale, as usually made, should be read from the side, not from the top, which is often absolutely inaccessible. When placed, however, so as to be read from the front, in the manner we indicate, all trouble vanishes. As we have said, there are lenses made with the improvement that we indicate attached, but, so far, we have only observed it in some hand cameras; however, we trust that before long all makers will sufficiently appreciate the advantage of the system we recommend that they will issue all lenses with diaphragm ratios so marked that to read them will be a matter of no difficulty, whatever position the camera may occupy.

Heat in the Studio.—The temperature of the studio has always been a source of trouble to professional portraitists. The problem in winter is how to keep it warm, in summer how to keep it cool. These difficulties are not so great with modern studios as they are with those of more ancient build, inasmuch as the former contain much less glass than do the latter. Still, there is the difficulty in each case. Good ventilation ameliorates the oppressiveness, even if it does not always actually cool the atmosphere. Ventilators driven by water-power, or a small electro-motor, are a great aid; so is sprinkling the floor with water, assuming it to be covered with oilcloth or the like; it would be destructive to carpets. One of the best means that we have seen in use of keeping the studio cool in hot weather is having a water-pipe laid along the ridge of the studio with small holes pierced in it, so that a series of fine streams are continually trickling down the roof. This arrangement keeps the studio delightfully cool by the evaporation of the water as it flows down. Anent the leader last week on leaky roofs and cracked putty, many may not be aware that during the hot weather, with the sun on the glass, the sash-bars, especially if of iron, will become so hot that the hand cannot be comfortably borne upon them, while the glass will feel quite cold, at least by comparison. What wonder, then, that the putty cracks, when it becomes dry and hard, owing to the unequal expansion and contraction of the sash-bars and the glass.

Natural Clouds in Landscapes.—One is often surprised that photographers, whose aim is to produce the best possible results, do not, when they have exposed a plate on a landscape, expose a second—giving a suitable exposure—on the clouds, supposing, of course, there are clouds present. Then, by double printing, without the trouble of blocking out skies, &c., a cloud negative, with clouds suitable for the picture, would be secured that would only require a little shading of the landscape in the second printing, perfect registration being a very simple matter, as each negative would be in perfect register with the other. If this were done, we should hear far less criticisms than we do at the exhibitions of the pictures being spoilt through the skies not being suitable to the landscape. These criticisms are not to be wondered at when it is considered that the stock sky negatives generally used by amateurs and some “art

photographers” are purchased at so much each, or per dozen, and then employed without discrimination as to whether they are suitable to the subject or not. It may be argued that the man who goes out with half-a-dozen plates does not care to expend half of them on clouds to make the other half complete pictures; also that the hand-camera man, with his dozen plates with which he is anxious to snap-shot anything or everything, does not care to expend that dozen to obtain six pictures. Be that as it may, three or six good pictures—really good pictures—are worth dozens of mediocre ones. In the foregoing remarks we have only mentioned plates, a limited number of which can be carried, but the case is different with films. The man who goes out with, say, forty films can well afford to be liberal with them in the matter of duplicate exposures for clouds, particularly seeing the ease with which such cloud negatives can be afterwards fitted to the landscapes in printing. As a hint to those who do feel inclined to adopt the course we hint at, we should say that the cloud negatives should be made, in development, of approximately the same density as the landscape one, because, if they are made very thin, as is usually the case with sky negatives, the skies will be of a different tone from the other portions of the pictures, particularly if the prints are made on some of the gelatine papers.

The Great Heat and Photography.—With the thermometer at 92° to 94° F. in the shade, the studio very much hotter, and a stuffy little dark room with, perhaps, a lamp lighted with gas, the professional's lot has not been a happy one for some little time past; therefore, when he is troubled with restless sitters, or refractory children suffering from the excessive heat, it is not surprising if at times he “thinks things,” even if he does not openly express them. Coupled with this trouble is the difficulty of working. Even some of the best-behaved plates are, with this exceptional heat, inclined to frill or otherwise give trouble. Gelatine papers, too, become decidedly tender under this abnormal temperature; therefore, as we have just remarked, the professional's time just now is not altogether a happy one, though, as a rule, he knows how to combat the difficulties. Not so, in all cases with the amateur, particularly if he has not had much experience, as several letters we have received during the past fortnight prove. In most instances the trouble has been put down to the fault of the plates, or the paper, as the case may be, whereas, of course, it is due to the excessive heat, and to that alone. The best advice we can give to the inexperienced amateur, while this great heat lasts, is to keep all the stock solutions in the coolest place available, and in diluting them to use water drawn from the coolest possible source. If a spring is not available, it is well to let the water run for some little time, so as to clear the pipes of the water they contain, as that will generally be found several degrees warmer than that in the cistern. If it can be drawn direct from the main, so much the better, as that will be found cooler still. After the plates are developed they should be put into a dilute solution of formaline, or one of alum, before they are put into the fixing bath. If this latter be used, the plates should be well washed to free them from the alum before they are put into the hypo. The same treatment applies to the manipulation of gelatine papers during abnormally hot weather. It is also advisable to use a freshly mixed solution of hypo, as this salt in dissolving makes the solution very many degrees cooler than it will be after standing an hour or two. Another precaution to take is not to put the fingers into the solutions more than can be avoided, as they, of course, have a tendency to raise the temperature still higher. We have not alluded to the use of ice and its advantages, as they will be obvious to every one, if it can be obtained.

A SILVER CHROMATE AND PHOSPHATE COLLODION EMULSION.

In a previous article (*THE BRITISH JOURNAL OF PHOTOGRAPHY*, May 25, 1900, page 325) Dr. Valenta described a method of making a phosphate emulsion which had a very high sensitiveness, and further experiments showed that it possessed such a long range of gradation

at very contrasted negatives were required in order to obtain brilliant prints. The phosphate collodion paper considerably surpasses albumen paper in this respect, and if it is desired to make a printing paper which shall act similarly to albumen it is necessary to make certain additions to the emulsion, which shall shorten the scale of gradation and give a greater differentiation between the individual tones. In this respect the phosphate emulsion behaves exactly like a chlorocitrate emulsion, and it has been proved that by the addition of chromic acid to the phosphate emulsion it is easy to obtain papers which are very similar, as regards gradation, to albumen paper. Chromic acid with this emulsion lowers the sensitiveness, but its action is such that it gives, with suitable quantities of acid, brilliant prints, and a sensitiveness far above that of albumen paper.

The same effect can be obtained in another way without the use of chromic acid or chromates, namely, by mixing a chlorocitrate emulsion with a phosphate emulsion in suitable proportions. For his experiment two emulsions were used of the following composition:—

A.

Collodion (four per cent.)	150 c. c.
Ether	30 "
Phosphoric acid (sp. gr. 1·26)	2 grammes.
Citric acid	·5 "
Alcohol	10 c. c.
Glycerin alcohol	2 "

B.

Silver nitrate	7 grammes.
Water	8 c. c.
Alcohol	15 "

B. Chlorocitrate emulsion.

This was made up in a similar way to the phosphate emulsion, only it contained, in the place of the phosphoric acid, equivalent quantities of strontium and lithium chlorides in the ratio of 2:1.

The sensitiveness and the range of gradation of both emulsions were now tested by means of a scale photometer. The phosphate emulsion proved to be from four to five times more sensitive than the chlorocitrate, and the range of gradation with the former 25°, and that of the latter 13°. Freshly silvered albumenised paper showed rather less sensitiveness than the chlorocitrate emulsion, and a range of gradation of 18° on the same photometer.

The following mixtures of the two emulsions were made:—

1. 10 c. c. of A.	.....	90 c. c. of B.
2. 20 "	.....	80 "
3. 30 "	.....	70 "
4. 50 "	.....	50 "

Tests with the papers prepared with these emulsions gave the following results:—

Mixture No.	Sensitiveness over Collodio-chloride Emulsion.	Range of Gradation.
1	2·5	17°
2	3·8	18°
3	4·1	20°
4	4·7	Over 20°

It is obvious from these experiments that it is very easy, by adding a phosphate emulsion to collodio-chloride of silver, to increase the sensitiveness, and at the same time raise the scale of gradation. —Photo. Corresp.

FOREIGN NEWS AND NOTES.

Etched Labels.—Every photographer knows how difficult it is to keep paper labels on the dark-room bottles, or, if they keep on, to keep them clean. The following method of etching labels is simple and cleanly:—

Solution No. 1.

Sodium fluoride	.....	36 parts.
Distilled water	.....	500 "

Dissolve and add—	
Potassium sulphate	..... 7 "
Solution No. 2.	
Zinc chloride	..... 14 parts.
Distilled water	..... 500 "
Dissolve and add—	
Strong hydrochloric acid	..... 65 "

For use, mix in equal parts, and add sufficient Indian ink, in powder or solution, to enable one to see the letters. This mixture rapidly etches glass or porcelain, so that it is advisable to use a small inkstand made out of solid paraffin, and also a quill pen.

The Effect of Intensification and Reduction.—In a very valuable monograph upon the sensitometry of photographic plates which has just been published in *Photographische Correspondenz*, and also separately, the author, Dr. J. M. Eder, gives the following table showing the effect of various intensifying agents and the hypo and ferricyanide reducer. It is complementary to that by the same author published by us in a recent issue of the JOURNAL.

Sensitometer numbers, 0·3 meter light distance.	Opacity of the gelatino-bromide plate before and after intensification and reduction.				
	Opacity of the untreated negative.	Slightly intensified with mercuric bromide and sodium sulphite.	2. Blackened with sodium sulphite.	3. Blackened with Ammonia.	4. Blackened with amidol developer.
11	--	—	0·16	0·15	0·22
10	0·15	0·2	0·19	0·22	0·27
9	0·21	0·24	0·27	0·33	0·35
8	0·27	0·35	0·42	0·52	0·47
7	0·38	0·55	0·59	0·71	0·65
6	0·51	0·78	0·72	0·90	0·83
5	0·66	0·95	1·02	1·30	1·01
4	0·81	1·25	1·31	1·56	1·26
3	0·91	1·50	1·61	1·92	1·57
2	1·05	1·70	1·38	2·35	1·84
1	1·19	1·91	2·25	3·00	2·12
a	1·43	2·12	2·70		2·60
b	1·55	2·30	3·00	quite opaque	3·00
c	1·65	2·70	quite opaque	opaque	1·47
					1·20

1. The mercury intensifier was: mercuric chloride, 2 parts; potassium bromide, 2 parts; water 100 parts.

2. A ten per cent. solution of sodium sulphite was used.

3. Ammonia diluted with 10-20 parts water.

4. Amidol, 2 parts; sodium sulphite, 20 parts; water, 500 parts.

Intensification after Ammonium Persulphate.—

At a recent meeting of the Photographic Society of Philadelphia Mr. J. Bartlett called attention to the fact that it is generally recommended to re-fix a negative which has been reduced with ammonium persulphate; but, when it is desired to re-intensify, it will be found that greater strength and brilliancy is secured by omitting both the sulphite of soda and the fixing bath, and intensifying with mercuric chloride, followed by sulphite of soda. The reduced silver forms a good substratum for the deposit of mercury, and by this method excellent printing qualities can be obtained in negatives which would otherwise be useless. It is necessary to carry on the intensification in subdued light, as strong light acts injuriously on the image attacked by the persulphate.

Restoring Old Daguerreotypes.—According to Belitzki, in the *Deutsche Photographen Zeitung*, old Daguerreotypes, which show the familiar iridescent markings, prove very stubborn when treated with the usual cyanide solution, and he suggests the following bath as much more effective:—

Potassium cyanide (five per cent. solution)	200 c. c.
Iodine	1 grammie.
Potassium iodide	3 grammes.
Water	100 c. c.

It must not be forgotten that the fumes of this are poisonous.

A NEW PROCESS FOR THE DETERMINATION OF POTASSIUM IODIDE.

[Reprinted from the *Pharmaceutical Journal*.]

POTASSIUM iodide is liable to be contaminated with the corresponding chloride and bromide, and these react in the same way as iodide with silver nitrate, hence a volumetric test with silver is of little use. It is evident that for the accurate determination of potassium iodide a method must be adopted in which the iodine alone is affected, and if possible liberated. Many processes are in vogue for this purpose, some dependent on the liberation and *distillation* of the iodine of the iodide, and others on its (the iodine's) oxidation to iodic acid.

The author has developed a process which gives exceedingly accurate results. The principle of the process is as follows:—When a mixture of potassium chloride, bromide, and iodide is dissolved in water and treated with a five per cent. solution of potassium bichromate and a ten per cent. solution of sulphuric acid, iodine, and iodine only, is liberated. The iodine is extracted with an immiscible solvent, carbon bisulphide or toluol, which is titrated with decinormal thiosulphate solution, and from the iodine found, the potassium iodide is calculated.

The analytical process requires the following solutions:—

1. Decinormal thiosulphate solution.
2. Iodine solution (decinormal or otherwise), whose strength relative to thio. solution is known exactly.
3. Potassium bichromate in five per cent. aqueous solution.
4. Sulphuric acid in ten per cent. aqueous solution.

Weigh out about 0·5 grm. potassium iodide, dissolve in 20 c. c. water contained in a stoppered separator, add 10 c. c. each of bichromate and acid, allow to stand three or four minutes, then add 60 c. c. toluol and shake vigorously. When the mixture has separated, run off the lower yellow acid stratum, and wash the toluol by agitation with various small quantities of water, adding washings to the first separate. The mixed washings are treated with more toluol in another separator, and if the toluol be coloured violet, it is, after washing, added to the toluol previously separated. The coloured toluol is then shaken out with about 30 c. c. thio. solution; the thio. is run off, the toluol washed to free from adherent thio. solution and washings added to first separate. The separated thio. is now titrated with iodine solution to determine the excess of thiosulphate which is deducted from the volume taken. As 16·473 grm. potassium iodide equal 1000 c. c. N/10 thio. solution, the percentage of iodide in the sample can easily be calculated.

The following extract from the author's laboratory note-book shows the accuracy of the process:—

1·2685 gramme potassium iodide was dissolved in water and made up to 200 c. c.

EXPERIMENT I.

49·8 c. c. iodide solution required

$$\begin{aligned} 37\cdot8 \text{ c. c. thio.} &- 18\cdot75 \text{ c. c. iodine} \\ (\text{factor } 1\cdot026) &(\text{factor } 1\cdot047) \\ = 38\cdot7828 \text{ c. c. thio.} &- 19\cdot63125 \text{ c. c. iodine} \\ = 19\cdot1516 \text{ c. c. N/10 thio.} & \\ = 99\cdot877 \text{ per cent. potassium iodide in sample taken.} & \end{aligned}$$

EXPERIMENT II.

49·8 c. c. iodide solution when mixed with 3 grammes potassium bromide and 1 gramme ammonium chloride required

$$\begin{aligned} 36\cdot75 \text{ c. c. thio.} &- 17\cdot7 \text{ c. c. iodine, which, after correction as} \\ &\text{above} \\ = 37\cdot7055 \text{ c. c. thio.} &- 18\cdot530 \text{ gramme iodine} \\ = 19\cdot1746 \text{ c. c. N/10 thio.} & \\ = 99\cdot949 \text{ per cent. potassium iodide in original sample.} & \end{aligned}$$

THOS. S. BARRIE, PH. C.

AMMONIUM PERSULPHATE AS A REDUCER.

[Translated from *Das Atelier des Photographen*.]

ABOUT a year and a half ago the discovery was made by Messrs. Lumière Brothers and Seyewetz that persulphate of ammonium was an excellent substance for reducing negatives, and that persulphate had the peculiar property of attacking the more dense portions of the image, whilst the finer tones were almost unaffected. I have since made use of persulphate and found it of great value. But I must acknowledge that I did not fully understand how and why persulphate acted in such a remarkable manner, and I had not the time to investigate its action more closely.

At the same time I could neither agree with the theory of the process as stated by Messrs. Lumière, nor with the opinion expressed by Professor Namias that thiosulphate of silver was formed and deposited upon the particles of silver constituting the image, and protected them from further destruction.

The fact that negatives, after reduction with persulphate, show a marked relief, the hollows of which are most pronounced where the persulphate has acted most, led me to the idea that ammonium persulphate might possibly attack the gelatine as well as the silver and dissolve it in the high lights of the negative, where the film had retained a more attenuated condition in consequence of the presence of the particles of silver.

With regard to the Lumière hypothesis, which may be briefly described as the action of persulphate upon the negative from within—not from without, as in the case of other solutions—this may easily be demonstrated as incorrect. If a plate is exposed through the glass and then immersed in the reducing solution, it will be seen that reduction proceeds in precisely the same manner as though the plate had been exposed in the usual way—that is to say, the persulphate attacks the densest part of the image with most effect. This proves the incorrectness of Lumière's theory that the reduction at the surface is prevented by the immediate deposition of silver from the silver sulphate formed by the excess of persulphate. If the supposition expressed by Namias be true, that the thiosulphate of silver formed is deposited upon the particles of silver, then the process must finally arrest the action of the persulphate, for the experiment with the plate exposed through the glass shows that the deposit, if a fact, must not only take place on the surface, but throughout the entire film, and consequently the denser parts of the negative would be protected; but this is not the case.

Thus the only hypothesis left is that the persulphate of ammonium primarily dissolves the gelatine and the adjacent silver where the former is most attenuated by the latter, and that the gelatine is not attacked where it is of greater consistency, that is to say, where less silver is present and more protection is given to it from the attack of the persulphate.

I have made the following experiments in support of this theory:—

A gelatino-bromide plate was cut in two. One half was fixed without exposure to the action of light, and, after thorough washing, should only have a coating of gelatine. The other half was exposed and developed in order to reduce the whole of the bromide to silver. The plate was then fixed and washed. Both films were stripped from the glass and separately immersed in a ten per cent. solution of persulphate of ammonium. After about fourteen hours the film of the second half, containing silver, was completely dissolved. The other film, consisting of gelatine only, showed no signs of attack at the end of a fortnight. To ascertain what resistance gelatine free from silver would offer to persulphate containing silver in solution, two gelatine films were prepared. One film was merely fixed and the other contained silver, but both were immersed in the same ten per cent. bath of persulphate. After fifteen hours the film containing silver was dissolved. The other film was scarcely affected, but ten hours later this also went into solution.

By the action of metallic silver upon ammonium persulphate a substance was formed which had the power to dissolve gelatine. It would appear, therefore, that the process of reduction with persulphate takes place approximately as follows:—

The solution of persulphate of ammonium permeates the gelatine film, and in the denser portions of the negative, where the gelatine is most attenuated by the particles of silver, it attacks the latter and converts them to sulphate of silver, which partly goes into solution. The ammonium persulphate is reduced to sulphate, and oxygen is liberated. The decomposition of the persulphate in the presence of water causes the formation of sulphuric acid, which attacks the gelatine and dissolves it. This process occurs in the first place where the gelatine contains most silver, as the molecules of the latter form the nucleus of the reaction. As the process continues, the action upon the gelatine becomes more pronounced, and at last the solution of persulphate penetrates to the

more protected particles of silver, and the entire image is destroyed by the prolonged action of the reducer. The reduction of a negative is comparatively quick, and in ten to fifteen minutes the entire image is dissolved. The film, however, remains adherent to the glass, and is apparently unchanged. The only indication of attack upon the gelatine is the formation of the relief. I have not yet had time to ascertain if the gelatine is also completely soluble when exposed to air. The experiments, in which the gelatine was dissolved, were made in stoppered bottles, and the evolution of oxygen was so great that at times the stoppers were forced out. It is, therefore, a question whether this evolution of oxygen plays an important part in the complete destruction of the gelatine film.* If a negative is completely bleached with persulphate, the image is not entirely removed. The negative retains a faint bluish tone. This tone is probably due to sulphate of silver which has not been converted by the reducer, and the process of washing fails to remove it.†

An experiment with one of these images formed of sulphate of silver showed that the tone was completely removed in the fixing bath, and that physical development with hydroquinone and silver nitrate intensified it slightly.

The results of my experiments led me to infer that, by addition of ammonium persulphate to the developer, the strong high lights might be held back in development. This opinion was verified. The following experiments were made in substantiation of this.

Two plates were exposed upon a window. One was developed in the ordinary way with amidol, and showed that the window was much over-exposed and degraded with halation. The other plate was developed with 50 c. c. of amidol solution, ‡ with addition of ten per cent. of persulphate solution.§ The image appeared slowly, and was harmonious and full of detail. The image could be seen more distinctly from the back of the plate than from the film side. This circumstance seems to indicate that the image is gradually attacked and dissolved by the persulphate during the process of development. These investigations are not yet concluded, but I think persulphate may also be found useful in this direction.

In all the experiments Ilford ordinary plates and an amidol developer were used.

After these experiments were made, I found an article by J. Gaedicke in the *Photographisches Wochenblatt*, 1898, p. 333, which had previously escaped my attention. In this article Gaedicke refers to the same hypothesis which I have here defended. It appeared as supplementary to an article by Dr. R. Ed. Liesegang, in *Liesegang's Archiv*, 1897, p. 161.||

Liesegang did not, however, treat of ammonium persulphate as a reducer, but as a means of producing gelatine images in relief. The article may be summarised as follows: If a fixed and washed bromide print upon paper be treated with a concentrated solution of ammonium persulphate, the image is bleached in less than a quarter of an hour. If the image be then rinsed, and carefully rubbed with the warm hand, all the dark portions of the picture are dissolved, and a relief image is left. . . .

By comparing this experiment of Liesegang's with my own, it seems proved that the action of ammonium persulphate as a reducer is ascribable to its capacity for dissolving gelatine in conjunction with silver.

D. NYELIN.

PHOTOGRAPHERS AND THEIR PUBLIC.

NEXT to the quality of the work which he produces, nothing is of more importance to the professional photographer than the manner in which he introduces it to his public with the object of obtaining their patronage. The following notes on some of the ways in which this matter is approached in actual practice have been compiled by the writer from personal observation of most of the leading London and many of the more prominent provincial studios, and are here offered as an incentive to the further personal consideration of the subject by the profession generally.

There has been reported—I forget where at the moment—the saying of a very successful commercial photographer to one no less eminent in the artistic quality of his work, “ You take a first-class picture and a second-class order, while I take a second-class picture and a first-class order.”

* In the vessel containing the fixed gelatine film without metallic silver a large evolution of oxygen was not perceptible.

† Dr. E. Vogel draws attention to the residual silver sulphate in the *Photographische Mitteilungen*, 1899, p. 146.

‡ Water, 1000; sulphite of soda, 25; amidol, 8.

§ Water, 100; ammonium persulphate, 4; sulphuric acid, 4 drops.

|| See also *Photographisches Wochenblatt*, 1897, p. 388.

If not apocryphal, this goes to prove that commercial success depends as much, if not more, upon how a man's work is exploited as upon the actual quality of the work itself, and so, in these days of keen competition, the photographer cannot give too much care, pains, and consideration to the manner in which he places his productions before possible clients.

Now, the first and most obvious way of doing this is by the display of specimens in windows and show-cases, and here in practice we find a great variety of methods and results. In some photographers' windows will be seen, year in and year out, just one class and standard of work, with no effort for improvement and no apparent perception of the advent of new styles and fresh processes. The worker has got into a groove and so goes on, day after day, producing in endless monotony, the “ usual thing,” and if you remark upon it he will generally reply that it has always done very well, and that he has neither time nor money to spend on improvements or efforts to do anything different, especially, as he will explain, now that times are so bad—quite forgetting that they might get better with him if he had some better and more varied styles of work to offer to his customers.

In other places, on the contrary, one finds all the latest processes employed and exhibited, and a considerable variety of work always on view—something, in fact, to appeal to and please everybody; and, although it is, perhaps, at present too much to expect that the general public will always choose that which is artistically and technically the best, yet the fact of its being shown and readily obtainable will in time create a demand for it. In proof of this it is only necessary to note the facts that, in the better and more prosperous class of studios, the demand for warm, soft tints and matt surfaces has increased with the facilities for obtaining them, and that now carbon and platinotype are slowly but surely ousting the shiny surfaces and generally unpleasing tints of toned silver prints. There is, perhaps, now only one of the principal establishments in London which makes a special feature of enamelled work, and even there the warmest possible tone is consistently employed, and, of course, all the other processes are obtainable as desired.

Next to variety of work being a desideratum, experience shows that it needs to be well displayed, and here there is great scope for both judgment and artistic taste. In some places, especially where there is plenty of window space, one finds a very large quantity of work exhibited without sufficient attention being paid to its quality or variety, and examination of some of these multitudinous displays, and comparison of them with others of more moderate extent, produces the opinion that it is very easily possible to have too much.

Among a very large number of pictures, some, at least, must necessarily be of more or less inferior quality, and these lower the general average of the whole effect, besides which the eye becomes wearied by looking at so many, and some of the best work may consequently escape attention. In the highest class and most flourishing London and provincial establishments, a moderate show of the best work produced, sufficiently varied, of course, to indicate the scope of the business, seems to be the best and most successful method, and it is usually only in second-rate places that one sees rows upon rows of work all similar in size and style, and at one universal dead level of monotony. The provincial photographer has often the advantage of his London *confrère* in possessing a moderate-sized and well-lighted window in place of the show-case or two, or badly lit entry, with which the latter has often to be content; but, on the other hand, he has to keep his specimens more constantly varied, as he has not the ever-changing flow of passers-by to see them that the metropolis affords. Every one is fond of pictures, and the photographers' windows of small or moderately sized towns are often the objects of regular visits by the inhabitants, and I have repeatedly heard such comments as, “ Oh! do come and look; here's a new portrait of Mrs. A.,” and “ Don't the Misses B. look nice! ” and “ That's a good picture of Mr. C.,” and so on through a whole alphabet of admiration and interest, concluding with, “ It's always worth while to come and look at Mr. Uptodate's windows; ” and have contrasted them with the “ Oh! come along; there's only that old picture of Mr. Mockturtle when he was Mayor the year before last, and old Lady Dowdy and the Misses Asper Usuals—Mr. Dryasdust never has anything fresh in his window” as heard before other establishments. The display of photographs of topical interest is always an unfailing draw, and when we go down Prince Regent-street we always stop in front of the Universcopic Company's window to see the latest portrait of General Lord Bullerts, now at “ the front,” or that of Miss June in the *Bells of London*, and so on, and some day we go in to be photographed on our own account, so well has what we have so often seen impressed us.

Another desirable point with regard to window displays seems to be that all work above cabinet size should be suitably framed. Comparison of places at which this is done with others at which it is not results in favour of the former as regards finish and completeness of effect, and the method has also the advantage of not only often bringing to the photographer a profitable trade in frames, but also of enabling him to see that his work is suitably and artistically framed before it leaves his hands, instead of afterwards being entrusted to the tender mercies of the average frame maker, whose ideas are too often limited to some spiky “ Oxford ” abomination, or an ill-designed combination of fussy and

misplaced ornament. Suitable mounting should also receive more careful attention than it very often does at the hands of the photographer himself, who usually keeps but one or two varieties of mounts in stock, and places everything, with but very little discrimination, upon them. This is not the place for an essay upon mounting and framing, but the importance of the proper study of both these means of improving, finishing, and setting off our work cannot be too strongly insisted upon in an article on its exploitation. I know at least one London establishment in which the neglect of proper mounting does much to spoil what would otherwise be a good window display. The work is of generally good quality, and mostly printed in platinum; but the greater part of it being done by electric light—and often, doubtless, with a certain amount of London dust and fog in the atmosphere—some of the prints are not as brilliant as others, but all alike are mounted on white cards with fairly wide margins, which, of course, compete severely with the high lights of the flatter pictures, and so produce a generally unsatisfactory and inartistic effect, which is still increased by the fact that the shop-front is also of a brilliant white—not a bad colour in itself for the painting of photographic premises, but in the present instance not going well with the white mounts and many white frames of the exhibited pictures.

This brings us to the consideration of the style and colour of shop-fronts, and of windows and their fittings as influencing the impression produced by photographers' works upon their public. The worker, being usually only the tenant of the premises he occupies, has but little control over their architectural features, but when taking a place he will do well to choose something not too elaborate and with not too much polished granite, shining metal, or carving about it, all of which will tend to swamp and depreciate the artistic value of his work. Fairly dark and unpolished natural woods form usually the best setting for photographs, both in frames and shop-fronts, and the very simple yet effective oak doors and windows designed by Mr. George Walton for the Eastman Company's Regent-street Branch may be cited as good examples of the right thing. For painted fronts black and gold is often dignified and unobtrusive, and white of a warm tint in conjunction with a dark Indian red may be sometimes effectively used. For show cases hard woods and simple mouldings are always safe, but elaborate carving and metal work are to be avoided. I know one establishment at which the cases are so carved and ornamented with *repoussé* work that it is almost a puzzle to find the photographs concealed therein. With regard to window fittings, the photographer who desires his display to always look well should have two or three different sets of draperies, &c., so that they can be varied to suit and harmonise with the show of the moment. The draperies (by which I mean any necessary curtains and coverings for stands and not a lot of useless frippery) may be of silk, plush, velvet, or serge, of which all tints are obtainable, and besides these a few pretty easels and stands are all that is really necessary. The man of taste will avoid quantities of palms, ferns, china monsters, pots and tiles, to say nothing of such things as the *stuft kittens* which I recently saw in a photographer's window! Before leaving this part of the subject, it may be just noted that one at least of our best male and one of our most patronised lady photographers do without outside display of any kind, conducting their businesses in what are apparently private houses, in which they receive their aristocratic clients, a dignified and quite professional method, but one not always possible for lesser lights, or for the more frankly commercial side of photography.

It ought to be hardly necessary to insist that whatever specimens are shown should be the actual work of the establishment showing them, but it apparently is so when one finds even good photographers displaying work obtained from other sources; while, at the lower end of the scale, I have seen the work of well-known men unblushingly placed outside a very fifth-rate establishment in a London thoroughfare, and we all are familiar with the advertisements of and for specimens which frequently appears.

Other methods of approaching possible sitters are to be found in the distribution of advertisements, circulars, and price lists. With regard to the first, it appears to be doubtful if general newspaper advertising is of much benefit to the artist, whose best ad. is the quality of the work sent out bearing his name; but, in the provinces especially, an occasional announcement in the papers under such circumstances as the taking or removal of a business, additions to premises, or of topical reference, or a well-printed and well-worded circular making such things known may be of advantage. Circulars should be sent by post, enclosed in a good envelope, and addressed in a good hand with the full names of the persons they are intended to reach. I regret to say that many of the specimens of this class of literature which I have seen have been not only badly written and ungrammatically expressed, but also very badly and inartistically printed; and such things, sent in a halfpenny wrapper, and roughly addressed, "____ Smith, or occupier," are almost certain to find their way into the W. P. B. (For the meaning of these cabalistic letters apply to the editor. He is used to giving other things besides circulars decent burial therein.) Of the price lists of London and provincial photographers I possess quite a large collection, but very few of them, even those of the best houses, are ideal productions, some being badly printed, some giving too much information, and others not enough. An artistic business should surely have its accessories of an artistic nature, and really good printing is but very little dearer than commonplace, not to

say common, work. It is surprising, too, how very few photographers have taken advantage of the possibilities of collotype and the half-tone process for the illustration of their price lists and circulars, though those who have done so have certainly benefited by so doing. A picture or two on a circular or price list may not only lead to their preservation, but also place specimens of the photographer's skill in posing and lighting directly into the hands of possible sitters; and I can speak personally of the benefit of adopting this plan of doing so. The class of price list above alluded to as giving too much information is that in which the photographer appears to have taken a delight in making everything as complicated as possible, and quotes you different prices for vignettes, half lengths, three-quarters, and full lengths; for groups of two, of three, and of more persons; for silver prints, platinotypes, and carbons (not to mention a few processes with barbarous names of his own invention), with extra positions, resittings, further copies, &c., all jumbled up together, until the whole is a maze of words and figures that may well repel the possible or intending sitter. By all means let all desirable information be given, but let it be properly tabulated and clear at a glance. The price list that does not give enough information is, if anything, worse than the redundant and muddled one, and none is complete that does not clearly state the terms on which business is done, cash or credit, the number of positions taken, and the conditions of resitting. The exact understanding of these things beforehand, and the printed statement of them for reference, would often save much after-friction and trouble.

And here I wish to put before my brother photographers a system by which not only would price lists and business be simplified, but the ever vexed questions of number of positions, proofs, and resittings be solved. It is to do away altogether with the arbitrary "first dozen" price (which has often the effect, even when the photographs are much approved of, of limiting the order to the said dozen as originally paid for), and to abolish the charges for "extra positions" and "resittings;" putting in the place of all these: "First copies, to any number of desired positions, sittings, or costumes, so much each," and "further copies of any of them, so much each." "First copies to be paid for at the time of sitting, and further copies at the time of ordering." Then the fussy or faddy customer could sit and resin, or come in as many costumes, or have as many positions taken, as she (it is usually she) desired or was willing to pay for; while the photographer would be paid in exact proportion to the work done (and why not, messieurs?); and both the profession and the public would be on a better footing. The writer has used this system with very great success when working for the dramatic profession, and has no doubt that any good photographer adopting it for his general work, and taking a dignified stand upon it, would find it answer equally well. The differences of price for groups of two, three, or more figures might also be done away with, for, although they contain more heads to retouch, the size of such heads is smaller in proportion, and there would then be only the matters of size and printing process to complicate business and the price list. With regard to printing processes, all silver prints, whether in albumen, gelatine, or collodion, might very well be classed together, and carbon and platinotype have but one price in common.

Next after the price list the attention of the would-be sitter is taken by the receptionist, on whose possession of good business ability and tact much of the obtaining of good orders depends, and therefore the importance of the photographer being well served in this department cannot be over-rated. In a lengthened experience I have met with receptionists good, bad, and indifferent, and, while the latter appear to predominate, the former are certainly born and not made. I have seen those who had every detail of the business at their fingers' ends; among these being, curiously enough, a smart little maiden still in short frocks, whom I recently encountered in the reception-room of a fashionable photographer, and others who could not answer the simplest question without reference to book or price list, and were completely non-plussed at an inquiry respecting an enlargement or a miniature. How a photographer's relations with his public are thus affected it is easy to see, and happy is he who possesses a wife or a sister to attend, *con amore*, to this part of the business if he is not lucky enough to have one of the born receptionists above referred to. The desirable qualities are, of course, knowledge of photography and its possibilities, plenty of tact and business acumen, good manners, and a lady-like and pleasing appearance, all of which it is not always easy to find combined in a single individual.

Another thing that has often an effect on the possible sitter is the condition and appearance of the shop or reception-room. Here over-elaborate embellishment and decoration is out of place, as tending to dwarf and swamp the effect of the work, and as giving to some sitters the idea that the prices asked are as much to pay for all the show and glitter as for the photographs they will receive; but these interiors should be quietly pleasing and unobtrusively artistic in effect; well lighted for the easy examination of specimens; fitted with comfortable seats and conveniences for waiting sitters and their friends; and, above all, perfectly orderly and spotless in their cleanliness. It should be superfluous to write the last clause, but judging from some places I have recently seen, and those not of the lowest class, it apparently is not so to offer such advice to some practitioners. When the specimens shown become soiled, or in any way *démode*, they should be at once destroyed, as a faded or damaged print is

doing more good among the residues than on the reception-room walls; and anything like litter or lumber should be scrupulously avoided. If possible, no work of any kind except the book-keeping should be done in the shop. There is an old saying that children and fools should never see things until they are finished, and without insinuating that those of a photographer's clients who have outgrown the first category are to be placed in the second, it is more likely that they will be pleased with work which they first see only in its completed condition, than if they behold it in any of its crude initial stages.

This, I think, also holds good with regard to the sending of proofs, which, if perfectly finished photographs, are far more likely to obtain good orders than the unretouched, untoned, and untrimmed prints which some photographers place before their clients. If the system of charging so much each for "first copies," as above suggested, were carried out, they would, of course, be perfectly completed prints, and the photographer could afford to make them so. If, however, a man shows no more respect for his own work than to submit it in a rough and unfinished condition he can hardly expect his clients to receive it with a greater amount, and so business suffers in the end. It also appears to me that the same effect must be produced by the indiscriminate giving of "free sittings," indulged in by some photographers on the off-chance of obtaining a subsequent order, which is surely an undignified and cheap-jack method of business, and if of momentary benefit to an individual probably injures him in the long run, and certainly lowers the status of the profession as a whole, which is the last thing that should be assisted by those who are proud of the calling they follow, and desire to see it keep its proper place among the useful arts.

DRINKWATER BUTT, F.R.P.S.

PHOTOGRAPHY AS AN OCCUPATION FOR WOMEN.

From the census returns of 1891 the total persons engaged in photography in England and Wales numbered 10,571: males, 8102; and females, 2469—in London, 1635 males and 610 females. This shows that the women employed in the trade amounted to a trifle over a quarter of the total. Since 1891 there can scarcely be a doubt that this proportion has been much increased, and probably at the next census we shall find that the women number a half, if not more, of those employed in photography. A marked feature of our time in commercial life is the influx of middle-class women into occupations formerly entirely under the control of men, it being greatest into all professions which are neither laborious nor carried on under exposed, dangerous, or unpleasant circumstances. Photography, being one of this class, falls under the selective action, and is an employment peculiarly inviting to that "monstrous regiment of women" seeking occupation.

Besides this, it must be admitted that the profession is well adapted to feminine capacity. Both as employers and employed, women meet with success, showing considerable enthusiasm and being devoted to the work. The ladies also now at the head of photographic establishments, and doing the operating themselves, give evidence of an ability quite equal to, if not surpassing, that of the best of masculine competitors. For every-day commercial work women, by reason of habit and training, seem much more likely to succeed than men. The chief supporters of the photographer are ladies and children, and in serving these the lady operator has every advantage on her side. She is an expert on all matters of dress, fashion, and questions of feminine etiquette, has a natural sympathy with children, and an intimate knowledge of the character of her sex, which few men possess. She is thus in a position to do and to say the right thing to put her sitters at their ease.

Ladies also give the preference to a female operator, and such a choice being beyond the control of the male photographer is fatal to any attempt to compete with a female rival. The ladies practising commercial photography have likewise given evidence of the possession of the faculty of gauging the public taste—an important aid towards business success. Mrs. Cameron also was able to divine what style of portrait would please her sitters. These ladies, however, are pioneers in the work, and of exceptional ability. It is thus open to question if weaker followers could maintain the same high standard.

Given a free field, it appears that the lady employer holds the advantage, and is the most fitted to survive in the struggle for business. Owing to the manner in which women are investing capital in suitable occupations, photography must in future fall under their control, with the consequent thrusting out of male competitors. The only thing that can stop the invasion is a change in middle-class sentiment which may go against the present movement towards business life for women, and return to the older ideal of seclusion and gentility.

Although, as employers, ladies are yet but a fraction of the profession, and have not ousted men to any alarming extent, the case is quite different in the ranks of the assistants. Here the introduction of the lady assistant has been so rapid that, if it continues at its present rate, in a few years the male assistant will be but a matter of ancient history. That this is no exaggeration the sceptical may satisfy themselves by taking a review of retouching during recent years.

Not more than ten years ago the lady retoucher was scarcely known, and formed but a minority, the main work being done by men. To-day

she has captured the position, the relations are reversed, the women form the majority, and the men are a small and fast-disappearing minority. A similar change is at the present moment occurring in the printing, and the male printer seems likely to vanish from the scene. Already in many houses it is the custom to fill up all secondary posts in the printing department with female hands as sensitizers, "fillers-in," &c., leaving simply the printing and toning to a head male printer. In small establishments, employing a single printer, there is likewise a tendency to engage a lady, and a glance at the advertisement columns of this JOURNAL will prove that the demand is a growing one. Perhaps the change will not be so quick as with retouching, but it seems certain to happen at no distant date, and in those days the photographer will no longer find a convenient scapegoat in the male printer. The lady operator has not yet arrived in any numbers, but it may be remarked her passage will be easy when once the public grow accustomed to the lady principal doing the studio work herself. A more serious obstacle in the line of progress is dark-room work, again which all women have a great aversion, the lady employer generally leaving this department entirely in the hands of male assistants. Apart from this drawback, which may be removed at any moment by the introduction of a method of open-light development, or other system abolishing the dark room, everything seems ready for the advent of lady operators in sufficient numbers to compete seriously with men. Finally, in other branches women have had a monopoly as colourists, receptionists, black-and-white workers, spotters, and mounters.

These facts can scarcely be overlooked, so prominent has been the advance of women both as employers and assistants, and such a change, when completed, must produce a great effect upon photography in general, and professional photography in particular. We know that photography, under masculine guidance, has progressed favourably during the years since its discovery. Looking back over its history, and noting from what it commenced to what it has now attained, it must strike all as one of the most brilliant records of the century, a work of monumental industry, devotion, and intelligence, and it must not be forgotten that professional men have done much towards this result. To equal such a record or to keep up this tradition, the feminine photographers will need to possess in their ranks some of the brightest intellects.

What is there to lead us to expect these great efforts from women, judging by their achievements in other capacities? Is there any evidence to lead one to conclude that photography will profit, start forward, or even continue in its course of triumph under female control? Perhaps a Mrs. Somerville, a Mrs. Cameron, may again arise, or even a series of ladies of greater photographic ability, though it seems quite visionary to expect a female Robert Hunt, Draper, Abney, Rijlander, Adam Solomon, Robinson; yet, unless minds of this calibre are working in the service of photography, it cannot progress. Guided by what they are now doing, we should expect a high level of good work from lady photographers, perhaps the average standard of trade work would be much higher than now, but of really striking, original, or progressive portraiture probably not a trace. Doubtless to the many this would be a decided improvement, although it leaves out of account the growth of photography, which is of more importance than the temporary success of a section. The number of lady employers is relatively so few that it is yet too early to predict with certainty what is likely to happen, and it is therefore useless to pursue the subject further.

Turning to the lady assistants, however, we find that several pronounced changes have already taken place. In retouching the reduction of wages has been very great. The old price for retouching a cabinet head in the leading houses was from 2s. 6d. to 5s., and even 7s. 6d.; present prices by women for similar heads is from 4d. to 1s. Wages in the masculine days were 2l. and 3l. per week; the wages now received by women are from 1l. to 1l. 10s. per week. This is a feature common to women workers without exception; the salary they receive is always less than that paid to men for doing identical labour. For this injustice-against women there is no remedy under our present social arrangement, because it arises from the fact that the wage paid to a man is a family wage, that is, it represents roughly the cost of subsistence of himself, wife, and family, whereas the salary paid to a female is merely the cost of subsistence of herself without relation to others, hence it always must be lower compared to a man's wage, whilst he is the actual, or probable, head of the family. It is therefore evident that, when women supplant men, the wages bill in photography will be greatly reduced. The photographer will thus gain the difference as profits, provided (a) the efficiency of female labour equals that of male, (b) that the selling price of portraits does not fall. These conditions, however, are not likely to be realised. In the first place, it is doubtful if women are as efficient as men in doing the same work, at least it has not yet been tested on a sufficiently large scale to justify such an assumption. The fact also that their wages are always so low indicates that in some essentials they are lacking compared with men. In every instance the salary paid to women is a bare subsistence, whilst, if their labour was as efficient as men's, they ought to receive an amount above this lowest rate, though not so high as that paid to the head of a family.

In a highly skilled profession like photography a low rate of pay is alone sufficient to prevent any body of workers, male or female, from

reaching the utmost point of efficiency; hence, assuming women as equal in skill to men, they could not maintain a high standard of work on the lower scale of wages. In retouching, something of this kind has actually taken place, for, since women have practised the art, there has been no marked improvement on the best work done by men, but rather a gradual decline in quality concurrent with the fall in piece-work rates and weekly wages. It is thus rash to conclude that the efficiency of the female retoucher will remain if employers insist on paying her a small wage—that is, below what her position and standard of comfort require.

With respect to selling prices, it is evident that the ordinary photographer of average skill cannot prevent prices from falling with wages, the mobility of capital being now so perfect that competition amongst capitalists soon brings down selling prices in accord with a drop in wages, by reason of a cheapening of cost of production. The fall in wages, following on replacing men by women, does not of necessity mean increased profits, but may lead to a decline in selling prices, which leaves matters rather worse than before. The higher the selling price of photographs the larger the proportion of profits, and any action that tends to raise or keep up prices is the most likely to benefit the photographer.

The conclusion forced upon us is that no gain can accrue to the employer by substituting the lady assistant for the man unless she proves his equal in efficiency and suffers no reduction in pay; for to sacrifice efficiency to secure a fall in wages can be of no permanent value either to employer or employed.

JOHN A. RANDALL.

CHROMIUM SALTS APPLIED TO PRINTING IN COLOURS.

[From the *Bulletin de la Société Havraise de Photographie*.]

THE process which I here describe permits the production of photographic prints on papers, fabrics, and other supports in all colours, which, at the same time, withstand the action of light and of chemical reagents to a remarkable extent.

I will not fully review the history of the process. There is nothing particularly new about it, but the extremely striking examples of it lately shown by M. A. Villain, who has himself done much to bring the process to perfection, induces me to bring it before my colleagues. The process is one well worth the serious attention of all photographers.

As is well known, a bichromatised gelatine coated paper becomes insoluble on exposure to light. If after removal of the excess of bichromate the paper be immersed in a bath of some colouring matter of the rosaniline family, such as fuchsine, Paris violet, Lyons blue, &c., the paper takes the colour most especially easily where the light has not acted, the insoluble gelatine protecting the fabric from the dye.

It only remains now to remove the subchromate in these insoluble portions by means of slightly acidified solutions. It will at once be seen that this process gives a positive from a positive, a negative from a negative. It gives, however, prints which are far from permanent in light, many of the dyes derived from aniline being extremely fugitive.

In 1859 Person sought to use the greenish oxide of chromium, produced by the action of light on potassium and ammonium chromates mixed together, as a mordant of the dyestuff, and described the following process in *l'Année Scientifique*.

Paper or fabric is placed in a solution of this double salt, dried in the dark, and exposed behind a negative. It is afterwards washed, by which the reduced chromate is removed, and treated in a dye bath. Extracts of such tintorial woods as logwood, venetian shumac, brazil wood, orchetan, quer-citron, &c., are suitable for this purpose. After a short immersion the oxide of chromium fixes the colour to the fibre. The treatment is then arrested, and the fabric washed and dried.

A few years ago, M. Villain, taking Kopp's process as his basis, and substituting for the tintorial substances mentioned above others more permanent in light, obtained very fine prints of great permanency. He used mostly anthracene derived colouring matters.

The artificial alizarines, sold in commerce as alizarin for red, alizarin for violet, &c., give with chrome mordants a certain red colour—that from the former being inclined to violet; that from the second to yellow.

Alizarin blue, alizarin black, gallo-flavin, purpurin, anthracene brown, orange, yellow, alizarin green, gallein, cerulein, have all in M. Villain's hands given images of great permanency towards light, acids, and alkalies. The deposition of these dyes being proportional to the amount of mordant in the fibre, which latter is in turn proportional to the light falling on the fabric, it follows that the process if properly conducted and with pure materials, may be regarded as a reliable photographic method.

In order to avoid any discolouration of the high lights, the paper should be carefully dried and the printing frames filled in non-actinic light, and development likewise conducted in a weak light, the chromate being far more sensitive to light than may be thought. Exposure should preferably be made soon after the paper has been prepared. This must be particularly observed in the case of textile fabrics, which themselves reduce chromic salts, thus giving rise spontaneously to chrome mordant with its attendant result—a general fogging of the print.

For the same reasons too high a temperature in drying should be avoided; in fact, all the precautions usually taken in the preparation of carbon tissue are necessary.

In cases where from some cause or other the prints do not exhibit perfectly pure whites, pass them into a bath of soap and carbonate of soda or into a very weak bath of chloride of lime containing a few drops of hydrochloric acid. After using this, wash in an alkaline bath and afterwards in water.

Formulæ.—Sensitising bath: M. Villain recommends the following, with which I have myself obtained the best results:—

Potass. bichromate	50 parts.
Ammonium metavanadate	5 "
Water.....	1000 "

Soak the tissue in the above for a few minutes, dry in the dark and the cool. Temperature should not exceed 25° C. (80° F.). Expose under a negative until all details are plainly visible. Rinse in cold water until it is no longer coloured yellow, i.e., till excess of chromate is removed.

The dried print can be kept indefinitely at this stage before being dyed. When this process is to be conducted, soak the print first in water, then place in tintorial bath; bring latter slowly to the boil and keep thereat for about fifteen or twenty minutes. Remove, wash, and if the high lights are not pure enough, treat as described above before drying.

Applications.—This is a process which lends itself to many very decorative purposes, such as the ornamentation of screens, curtains, &c. It is simple, easy, and inexpensive, and, as M. Villain's prints at the Champ-du-Mars demonstrate, capable of giving the most charming results.

A. SORET.

THE HISTORY OF PHOTOGRAPHY IN NATURAL COLOURS.

At the annual meeting of Swiss Photographic Societies held not long ago in Lucerne, Professor Barbieri read a paper in which he gave a useful review of the history of photographic processes in colour. Dr. Barbieri presides over the photographic school of the Zurich Polytechnic, and he is, as we discovered on a visit we recently had the pleasure of paying to his department, a teacher in the best sense of the word, explicit and infectiously enthusiastic. Our version of his communication is translated from our contemporary *Revue Suisse de Photographie*.

Two processes have been employed up to the present time for obtaining photographs in natural colours. The older of the two is the direct; the other adopts the method of preparing three colour sensation negatives, one for the red, one for the blue, and one for the yellow. The print is thus obtained in every tint by the mixture of these three colours.

Seebeck was the first to obtain direct coloured prints. He found that silver chloride not only deepened in tint but became coloured when exposed under coloured glasses. A more important observation was that of Becquerel who found that a more exact reproduction of the colours was obtained by combining chlorine and silver by electrical means. Becquerel also made the observation that the coloured result was more nearly perfect if the film were submitted to a preliminary exposure to daylight. This fact is an indirect proof that the reproduction of the colours depends more upon the action of light upon the sub-chloride than upon the normal chloride.

Poitevin improved on Becquerel's process by adding to the sensitive mixture substances to increase the sensitiveness to colours without, however, producing any action on the sub-salt so essential to the process. The method used by Poitevin was afterwards very considerably improved by the well-known photo-chemists, Krone, Kopp, Veress, Valenta, and others.

Next in the history of the direct process come the experiments of Lippmann who followed out experimentally the process described by Zenker in 1868. This process consisted in employing a film sensitive to all colours and a mirror of liquid mercury. The rays passing through the film fall upon the mirror, by which they are reflected through the film. The reflected rays show the interference produced by the film, i.e., the existence of waves capable of retaining coloured rays in the sensitive film. Lippmann's coloured prints are thus not formed by any pigment. Their colours are visible only when they are viewed by reflected light, but they are none the less permanent. Others have taken up and improved Lippmann's process. I may mention Krone, Valenta, and Lumière. The last especially has produced since 1892 landscapes and portraits by Lippmann's process.

It was Lippmann who conceived the idea of replacing the bromide of silver by bichromated gelatine. But here also the colouration is seen only by reflected light. The theory of Wiener as to the production of coloured images with silver compounds does not hold good in regard to these coloured images in bichromated gelatine because in this latter there are no silver layers, and Wiener's theory is based on the fact that the super-imposed and reflecting layers of silver in the film are the cause of the colours. One must thus conclude that the colours are caused by reflection from fine films of unchanged gelatine.

The basis of the various indirect processes of colour photography is the production of three negatives by means of three different light filters—three plates sensitive to red, yellow, and blue. With these three negatives polychrome prints can be made in various ways.

De Rausonet proposed to make three negatives by means of yellow, blue, and red filters, from these three lithographic stones, and to afterwards print in the appropriate colours by lithography. But this process did not give good results, for, though the negatives were taken through coloured screens, the plates were not specially sensitive to the different colours. Du Hauron's process suffered from the same defect. He printed from his negatives in carbon, and transferred to plates of mica.

When Vogel invented colour-sensitive plates, Drs. Albert and Obernetter were the first to succeed with tricolour reproduction.

But there are still many difficulties to be overcome. The problem of the selection of the proper blue, yellow, and red colours is one; these three colours must be such as shall give every other colour by admixture, a condition which at present cannot be fulfilled. As a matter of fact, the same three colours should be used for both sensitising and printing—a very practical difficulty—for most sensitizers are useless for printing purposes. Hence resource must be had to those colours which lend themselves to the printer's art, and hence, although extremely beautiful reproductions are made, facsimile representations of the originals are, at present, not possible. Still, there is no occasion to despair. Wonderful progress has already been made, thanks to the researches of, amongst others, Dr. Vogel, Baron Hübl, Frisch, Husnik, and Angerer. Before leaving photo-mechanical colour processes, mention must be made of the synchronotypes of Turati, which are obtained by means of a press constructed by Turati himself, and with which only a single impression is required to give all the colours.

Amongst non-photo-mechanical processes, that of Ives led the way in viewing three images at one time. His apparatus simply consists of a lens through which the rays of light fall on one plate directly, and on two others by reflection. Each plate is provided with suitable screen, and the positives printed from the negatives thus obtained are viewed against the glasses corresponding to the taking screens.

Vidal projects the three positives on to a screen. Nachet adopts Ives's arrangements, using stereoscopic apparatus. (Projection and stereoscopic apparatus are included in Mr. Ives's colour apparatus.—Translator.) Selle makes three positives on collodion films, which he dyes red, blue, and yellow respectively. They are then super-imposed and projected.

Joly uses the idea of McDonough, taking a single view through a ruled screen of coloured bands, red, green, and blue, repeated across the plate. The result is a negative of very fine lines. A positive is made from this and placed in contact with a screen similar to that used in the camera, line to line.

Stockert's process possesses much of interest. From each of the negatives made, as for the tricolour process, a print is taken in gum-bichromate, the first for the yellow, the second for the red, and the third for blue. The three prints are made on the same paper, one on top of the others, sensitising twice more after the first printing.

Lumière similarly uses carbon. Hofmann has a similar process, in which the preparation of the negatives and registration of the prints is assisted by ingeniously devised apparatus.

PROF. D. BARBIERI.

THE LATE W. MCLEISH.

We regret to announce the death of Mr. William McLeish, photographer, of Northgate, Darlington, which took place on Sunday at midnight. Mr. McLeish was seventy-five years of age, and unmarried. For the last three or four months his health showed a gradual decline. At first he was simply confined to his house, and then he had to take to his bed, until the end gradually came. He had no relatives in the district; the nearest one is a brother of eighty, but hale and hearty, who resides in Perthshire.

Mr. McLeish was a native of Perthshire, and went to Darlington about forty years ago. Changing his occupation from that of gardener, he became a photographer, occupying for some years a wooden erection in Grange-road, Darlington. The measure of success that he achieved in the years that followed showed that he had found his forte in taking up photography. After a few years at the above place, he removed to Northgate, and there he remained until the end, living in rooms adjoining his establishment. He gradually built up a most lucrative business, and at one time was undoubtedly the leading photographer in the district. In the exercise of his profession, he at one time employed quite a number of assistants, and trained several pupils, who have since given proof of the ability of the master to teach, and the pupils to learn. Mr. A. H. Harrow, photographer of Priestgate, Mr. Morgan, of Durham, and others were privileged to serve in the studio of Mr. McLeish.

A few years ago Mr. McLeish commenced a branch establishment in West Hartlepool, but subsequently gave it up. He had patrons of high degree, and had done work for Lord Barnard, &c. The recent presentation portrait of the Bishop of Hexham and Newcastle was entrusted to him. He never took an active interest in the affairs of his adopted town, but was devoted to his profession, and found it quite sufficient to keep him well employed, especially in the second and advanced department of it, that of painting. He was an artist as well as a photographer, and the combination of the two was in him a complete success. He was of

venerable appearance, with his long, patriarchal beard, and was of a generous disposition, giving liberally to necessitous cases, of which he generally had some on hand. He was well liked and highly respected by all with whom he came into contact.

In his professional labours he was gifted, painstaking, and original, and made a name for himself far beyond the bounds of Teeside. He was one of those who made an endeavour to bring to a state of perfection photography on a life-size scale. Whenever his photographs have been exhibited they have received medals and awards. At the Brussels Exhibition he gained the silver medal. He obtained similar honours in connexion with the Royal Photographic Society's Exhibition, the Bewick Club, Newcastle, and at exhibitions in the leading provincial towns. To the technical skill of the photographer, Mr. McLeish added the eye of the artist, and the numerous examples of carbon studies from life showed how thoroughly the two had become blended. In his own work in oils one is struck with the delicacy and strength with which he has depicted the scenery of Perthshire and the Western Islands. His *Monarch of the Glen* has become household property through the enterprise of the fine art publishers, who have reproduced a quarter of a million copies of it. It was in the early eighties that Mr. McLeish first made his name with the famous photograph, *A Misty Morning on the Wear*. This remarkable picture created a sensation, and was one of the chief exhibits in the Pall Mall Exhibition of the year. This picture is indeed very impressive, and the atmospheric effect of the misty morning, with the sun, is rendered in a way to make the painter envious. Of this photograph between 2000 and 3000 copies have been printed, till the negative has become defective, but copies have gone all over the world. Mr. McLeish was offered 300 guineas for the copyright of *Sympathy*, which will afford some idea as to its value, and his other works are also of great value.

ARTIFICIAL BACKGROUNDS.

[Patent No. 15,950 of 1899.]

MR. T. R. WATSON'S invention consists in painting over the original backgrounds in photographs with suitable paint or metallic composition, such as gold, silver, or bronze powder, leaf, or paint.

After the paint has been applied, a roughened or embossed appearance may be given to it, so as to make it resemble hammered or ornamental metal.

In place of painting over the original background, the photograph may be cut out (like a scrap picture) and mounted upon glass, and the paint or composition be applied to the back of the glass.

Gold leaf, aluminium, tin, or lead foil may be used.

JACKSON'S IMPROVED DARK-ROOM LANTERN.

[Patent No. 5564 of 1900.]

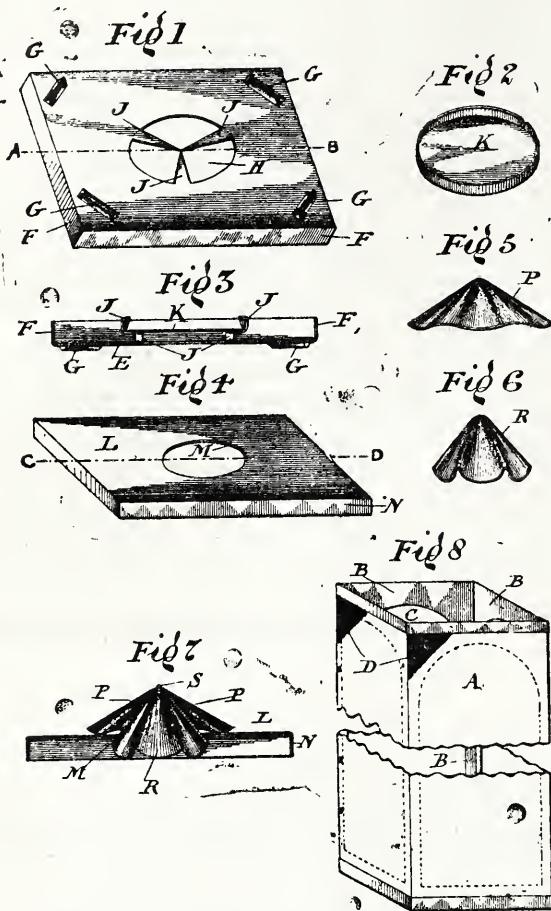
In his specification Mr. Jackson says: I provide a lantern, A, composed of four metallic frames, such as B, each provided with an opening, C, and all four covered externally by a ruby-coloured fabric, D, adapted to form joints between the frames, and enable them to be folded up into a small compass in the usual way.

For such a lantern body, A, when opened out, as at fig. 8, I provide a bottom (fig. 3) upon which the body may be stood, the bottom being produced from, preferably, sheet metal, and, by the means of suitable dies, presses, and the like, would be formed to provide a bottom portion, E, with turned-up edges, F, so that the lantern body may stand upon E and within F. The bottom, E, has punched-up portions, G, to form feet, as at fig. 3, and punched-out central portion, H, adapted to provide two or more projecting pieces or wings, J, these, when suitably bent about, serving to support and hold a metallic tray, K (fig. 2), in manner shown in fig. 3, so that the candle, night-light, or other illuminant used may stand in the said tray, K, in the usual way, the opening, H, and space between the projections, J, serving to provide the inlet for the necessary air to support combustion.

The second portion of the invention relates to the canopy or cover for the lantern body, which I provide also of sheet metal, and, by the use of suitable dies, presses, and the like, I form this as at fig. 4, which consists of a preferably flat portion, L, having a central opening, M, and turned-up edges, N, so that while L may rest upon and close the upper end of the lantern body (fig. 8), the said turned-up edge, N, may form a rim for retaining the said cover in position thereon.

The opening, M, is to provide the necessary ventilation, and in order that rays of light from the illuminant in K may not exude through M, I produce two circular metallic plates, which, by the means of suitable dies or presses, I provide with radial corrugations or flutings, until they appear as at figs. 5 and 6, the larger of which, P, I mount upon the upper surface of the cover, L, covering and extending considerably beyond the limits of the opening, M, while the smaller corrugated plate, R, I pass

upward through the opening, *m*, until arrested by its outer surface abutting against the edges of the said hole, when I connect *P* and *R* together by the means of a central rivet screw or pin, *s*, which effectually



serves to retain both in position, as shown in fig. 7, the diametrical measurements of *P* and *R* being such as to entirely obviate the possibility of light rays escaping between them, while their respective corrugations provide ample ventilation.

DE REDON'S IMPROVEMENTS IN TRIPODS.

[Patent No. 5161 of 1900.]

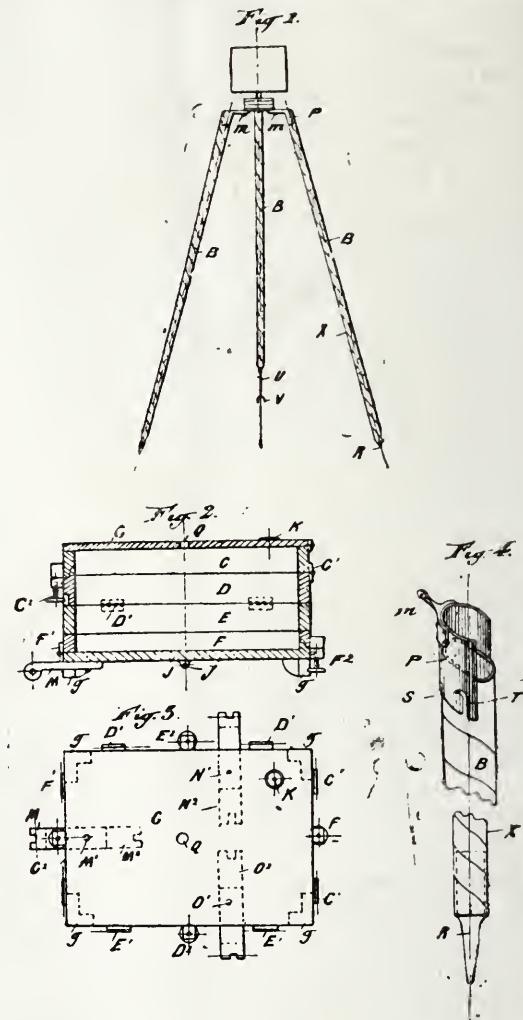
THE invention consists of a tripod with collapsible or reducible and dismountable legs, and an adjustable head or box which receives the apparatus to be supported, and admits of its being levelled or adjusted horizontally.

The adjusting box or head consists of parts or frames, *c*, *d*, *e*, and *f*, superposed on one another and united or connected together by hinges, *c'*, *d'*, *e'*, and *f'*, in different directions, and provided with regulating or adjusting screws, *c*², *d*², *e*², and *f*², for levelling or horizontally adjusting the upper face or surface, *g*, of the box or head which receives the stem or coupling of the apparatus in the central hole or aperture, *o*. A circular spirit level, *k*, mounted upon the surface, *g*, admits of the adjustment or levelling of the box or head being effected. The interior surface, *j*, of the box or head is provided with brackets, *g*, and with lugs or pieces, *m*, *n*, and *o*, arranged to turn upon points, *m'*, *n'*, and *o'*, in the position shown in dotted lines at *m''*, *n''*, and *o''*. These lugs or pieces are terminated by a perforated mortice, which can engage and be held in place by a pin an arm or projection, *m*, also perforated and connected to a curved or bent plate, *P*, provided with a curved slot or groove, *T*, which forms a bayonet joint with a pin, *s*, fixed upon the legs, *b*. These latter are formed of an elastic and flexible band or strip, *x*, spirally wound in such a manner as to be capable of allowing the said legs, *b*, to be lengthened or shortened.

In order to impart to these elastic strips or bands, *x*, a sufficient degree of rigidity, their upper portions are firmly gripped or held in the curved or bent plate, *P*, by means of the pin, *s*, and their lower extremities are each fitted with a point, *n*, fixed in a block of hard wood secured to the metal band or strip. A cord or thread, *u*, provided with a forked piece, *v*, and hooked or hung to the lower side, *j*, of my adjusting box or head, *j*, at the point, *j*, serves the purpose of augmenting the stability or fixity of the apparatus by forcing the said forked piece into the ground.

In order to dismount the tripod, the bayonet joint, *T*, *s*, must be dis-

connected and the flexible bands or strips collapsed or telescoped by bending their lower ends towards their upper ends. The connection between the lugs or pieces, *m*, and the projections or studs, *m*, are next



undone and the lugs or pieces, *m*, are turned under the adjusting box or head. The bent or curved pieces, or sockets, *P*, and the legs, *x*, are put into the box or head, the whole occupying but little space.

Our Editorial Table.

A CATALOGUE OF PHOTOGRAPHS.

By Messrs. Alfred Ellis & Walery, 51, Baker-street, London, W.

RUNNING to considerably over a hundred pages, this catalogue is a tribute to the energy and skill with which Mr. Ellis has built up the well-known business that bears his name. In the photography of celebrities he has secured a very high and well-deserved reputation. The catalogue bears the sensible recommendation, "Keep for reference." It is simply indispensable to editors of illustrated papers and other persons called upon to make themselves acquainted with the photographic presentations of people who have achieved the transient glories of popularity or notoriety, as the case may be. Thus there are sections devoted to royal personages, the aristocracy, authors, artists, composers, dramatists, editors, clerical, medical, and scientific, music and the drama (the fair sex taking up thirty-six pages of print, while the mere males only occupy fifteen), theatrical managers, plays, M.P.'s, naval and military, and sporting celebrities. Then come lists of London and country views. The catalogue is well printed and illustrated, and the cosmopolitanism of the stock of negatives of which it is the record should secure it a wide field of usefulness.

MR. GEORGE JOBSON, of Adin Villas, Boston-road, Horncastle, England, sends us a little pocket article which appeals alike to the smoker, the photographer, and the cyclist. It is an "electro-plated German silver" match-box, which, besides serving the useful office of storing the means whereby the pipe, the cigar, or the cigarette may be set going, carries on a spring roller a band of fabric upon which is printed a cyclist's lighting-up table for the year and a photographic exposure guide. This little novelty, for which the small sum of 2s. 6d. is charged, may be had of any photographic dealer or from Mr. Jobson at the address above given.

CATALOGUE OF PHOTOGRAPHS OF SAILING AND STEAM YACHTS; SAILING SHIPS; DEEP SEA AND RIVER STEAMERS.

By J. ADAMSON & SONS, Rothesay, N.B.

HOTOGRAPHS of some hundreds of vessels are listed in this unique catalogue. Messrs. Adamson state that they hold the largest collection of photographs of yachts, steamers, &c., in the world. They undertake the photographing of every kind of craft under sail, steam, or at rest, in any part of the country. We are glad to see the following emphatic warning printed in the catalogue: "Our Marine negatives are registered copyright, and as our collection has been got together at a very large cost, we warn any one who may reproduce them in any way that they lay themselves open to an action for substantial damages." All those interested in yachts and ships should procure a copy of this catalogue. We have labelled it unique—to the best of our knowledge no other firm of photographers issues a similar list.

PHOTOGRAPHS OF THE PARIS EXPOSITION, 1900.

By M. ALBERT LÉVY, 4, Avenue Pinel, Asnières, Paris.

HE photographs taken of the Paris Exposition by M. Lévy make a set of 100 12 x 10 views, which are the outcome of a systematic attempt to reproduce the principal external architectural features of the world of beautiful buildings now open on the banks of the Seine. M. Lévy kept himself rigidly to his self-imposed task of giving his photographs this particular interest, and in many cases views in detail accompany the pictures representing entire buildings or the principal parts of them. The photographs are arranged in consecutive order, commencing with the main entrance and taking the palaces as the visitor might be supposed to pass them during a tour of the Exposition. The set before us is printed by the ferro-prussiate process, and, enclosed in a suitable portfolio, sells for £1, separate views not being obtainable. As a record of the principal external architectural features of an Exposition the like of which Europe may not look upon again, M. Lévy's photographs are of very great interest indeed. The album may be obtained or ordered of Mr. Batsford, architectural publisher, High Holborn, London. Most of the photographs taken at the Paris Exposition fall in the category of general views, and do not attempt to convey an idea of the structural beauty or grandeur of the principal buildings. This is what M. Lévy has succeeded in doing in the set of views before us. Those who study the Exhibition from this standpoint could not have a better souvenir of it. To readers of this JOURNAL it should, perhaps, not be necessary to mention that M. Lévy's experience in architectural photography extends back a quarter of a century or more. These pages and those of our ALMANAC have often contained hints from his pen on points of photographic practice.

A RADIOGRAPHIC LIST.

Published by Isenthal & Co., 85, Mortimer-street, Cavendish-square, W.

VERY early in the practical applications of radiography Mr. A. W. Isenthal took a prominent place, and his firm to-day probably stands foremost amongst those houses who make a speciality of the supply of apparatus for this branch of work. The list before us bears the aspect of having been compiled by the light of a thorough knowledge of the subject. What is best and most advisable in coils, interruptors, batteries, tubes, screens, and fluoroscopes, plates and films, and other accessories, is fully set forth and illustrated. The list, in fact, appeals to the specialist in radiography, and it has the merit of being compiled by specialists. Messrs. Isenthal say: "Our Röntgen laboratory is by far the most completely equipped in the United Kingdom. We have both continuous and alternating current at our disposal, and are thus able to demonstrate every instrument contained in the present list to intending purchasers. Both our Röntgen installation and our dark room may be used, by special arrangement, by experienced radiographers who wish to temporarily avail themselves of such powerful apparatus." This is the most useful and carefully compiled radiographic list that we have seen.

Studio Gossip.

A SOUVENIR of the war in South Africa has been published by the London Stereoscopic Company. It consists of photographs of our generals at the front grouped round a medallion portrait of the Commander-in-Chief. The souvenir is called "Heroes All," and the Directors of the Company wish it to be known that they will send, gratis and post free, as many copies of "Heroes All" as may be applied for by the managers of every hospital, sick ward, convalescent home, or other resort, where our invalided soldiers and sailors returned from South Africa are being treated, in order that these souvenirs may decorate the walls and interest the invalids. Presentation copies have been accepted by Her Majesty the Queen, the Prince of Wales, the Princess of Wales, the Duke of York, the Duchess of York, the Duke of Saxe-Coburg and Gotha, the Duke of Connaught, Princess Christian, Princess Louise (Duchess of Argyll), Princess Henry of Battenberg, and the Duke of Cambridge.

EFFECTS OF COLOURED LIGHTS ON THE NERVES.—French scientists have been making some very interesting experiments in connexion with the effect of certain colours on the nervous system. And people who have been somewhat scoffed at for calling red warm and blue cold and yellow invigorating, may now kindly regard themselves as forerunners of a great discovery. Henri de Parville, of Paris, asserts that the red end of a spectrum excites the nerves, while violet, green, and blue are soothing. Dr. Bonza goes many steps further, and attempts to cure nervous diseases by the use of certain colours. Melancholia he treats with red, violent mania with blue, and nervous prostration with violet. The very grave question arises as to how the woman already nervous will stand the prescription of an unbecoming colour. Dr. Dor, another experimenter, has brought on vertigo in patients by the use of red lights, and relieved the symptoms by changing the ray from red to green.

FIGURE GROUPS.—In the course of an able and interesting paper on figure-studies by photography, Mr. T. Lee Syms, in the *Photographic Record*, says: "In lighting a figure group, due regard must be paid to the colour of the costumes, and if special dresses are not used, one must bear in mind that reds and yellows come out darker and blues lighter than they appear to the eye (of course isochromatic plates and screens are out of the question for inside work). If care is not exercised in this particular, we shall probably have the principal figure taking a minor position, and a secondary one coming out to the front. Taking it all round, I find it best to either select a few costumes, with due regard to their photographic qualities, or have them made up specially of varying shades of grey. It is, however, essential that they be well worn and characteristic; as to me, nothing is so bad as obviously dressed and posed models in a picture. Much pure white drapery should be avoided, a rinse in a weak yellow dye greatly improving such from a photographic point of view. Children should be dressed in plain simple things, clothes that can be romped in without fear of damage and of a dark cream for the lighter one. A special pinafore or two and a bonnet and hat are worth investing in, as sometimes a splendid model, unsuitably dressed, will be found, and if the right things are at hand, a minute or two works quite a transformation. On no account let the models look as if they had just stepped out of a bandbox. For older models, a blouse or two of unobtrusive patterned calico and a skirt or so, dyed at home to the shade required, and not too much starched and ironed, will be found useful, and if the pattern is not too pronounced, will not be recognised as old friends in every picture, as they will look quite different in every change of lighting. Always strive to make the clothes look part and parcel of the picture. The same remark applies to the accessories. Many otherwise excellent prints are spoiled by the models being palpably made up and out of all harmony with their surroundings. For this reason, avoid as much as possible fancy pictures in dress of any other period than the present or the immediate preceding one. Not many people nowadays can wear a Court costume with anything like natural grace, excepting, perhaps, actors, and they generally are the worst of models for our purpose, their dramatic poses not being suitable at all for picture making, besides which their make-up always looks artificial in a photograph. On the whole, it is better to be content with every-day subjects, such as are found around us in profusion."

News and Notes.

AFTER an investigation into the effect upon the eyesight of the incandescent electric and incandescent gas lamp, the University of Heidelberg has decided that neither light, if properly placed, has any bad effect upon the eyes. On the question of lighting, the Committee in charge decided that for the lighting of rooms, especially concert rooms and lecture halls, where many people remain for long periods at a time, the electric light is without doubt to be preferred to all others from a hygienic point of view.

THE G.E.R. "TOURIST GUIDE TO THE CONTINENT."—We have received a copy of the Great Eastern Railway Company's *Tourist Guide to the Continent*, published at the price of 6d. Among its fresh features are particulars of the new Ober-Ammergau tours; express services to Norway, Denmark, and Sweden, via the Royal Mail Harwich-Hook of Holland Route; of new tours in the Luther Country, and Thuringian and Hartz Mountains, a series of Continental maps, and a chapter, "Dull Useful Information," giving particulars as to the cost of Continental travel.

A CORRECTION.—At the conclusion of Mr. S. B. Webber's Convention paper on *Residues and what to do with them*, the following passage occurs in some copies of last week's JOURNAL: "I propose to make a gentleman's hoop ring, weighing about $\frac{1}{2}$ ounce, by alloying 9 cwt. of fine gold with 2 cwt. of F silver and 1 cwt. of F copper, producing 12 cwt. of 18 carats gold." It needs hardly be said that the obvious errors are typographical, and that throughout the passage "dwts." should be read for "cwt." A gentleman's gold ring weighing 24 cwt. would, indeed, be a remarkable production! By the kindness of Mr. Webber, the ring which he made at Newcastle has been adapted for the use of a lady.

THE Rotherham Photographic Society's Eleventh Annual Exhibition will be held in the Drill Hall, Rotherham, on Wednesday, Thursday, Friday, and Saturday, 17, 18, 19, and 20 October, 1900. The following are the open classes:—A. Photographs, any subject (previously medalled). Medals—one silver gilt, one silver, and one bronze. B. Photographs, any subject (not previously medalled). Medals—one silver and one bronze. One certificate. C. Lantern slides (sets of four). Medals—one silver and one bronze. One certificate. Entry forms and further information respecting the Exhibition may be obtained from Mr. H. C. Hemmingway, Hon. Secretary, Tooker-road, Rotherham.

ROYAL ACADEMY ELECTIONS.—There were two elections at the Royal Academy last week: one for an A.R.A., caused by the retirement, through ill health, of Mr. P. R. Morris; the other for a Professor of Painting, rendered necessary by the resignation of Mr. Hubert Herkomer, R.A., who succeeded Sir William Richmond, R.A., only last summer. The method of the Royal Academy is peculiar in its elections. The "first round" is termed the "scratching," the second the "black-board" ballot, and then comes the final ballot. In the end, Mr. Joseph Farquharson was elected as the A.R.A., and Mr. Val Prinsep, R.A., as the Professor of Painting. It was generally thought that Mr. G. A. Storey, R.A., who was defeated by Professor Herkomer at the last election, stood the best chance for the Professorship, but Mr. Val Prinsep secured eighteen votes to Mr. Storey's seven. Of course, as usual, there are divided opinions as to whether the best men have secured the coveted honour, but we expect that will always be the case at every R.A. election.

BALLOON OBSERVATIONS.—We read that the largest balloon ever constructed is to ascend from Berlin next month to make meteorological and scientific observations. The balloon, it is said, is capable of lifting more than six tons, and will be supplied with provisions for several weeks and two beds. It will be interesting to see whether the balloon will be able to keep afloat for several weeks. Many valuable researches have been made from balloons, but mostly from those of moderate size, capable of remaining in the air for a comparatively short time only. It remains to be seen what will be accomplished with one that will keep afloat for several weeks, if it does so. By the way, speaking of balloons, it seems that the trial of Count Zeppelin's navigable balloon turned out more or less a failure. However, its inventor is still sanguine, and, after some alterations and repairs, intends shortly to make another trial. Although many attempts have been made to construct a navigable balloon, the thing remains to be accomplished. Will Count Zeppelin accomplish it? If so, all honour to him.

Commercial Intelligence.

MACHINERY FOR P. O. P. MANUFACTURE.—In reference to some recent queries in our columns. Messrs. Ferdinand Flinch & Co., of Offenbach-on-Main, Germany, write that they are making complete plants for manufacturing printing-out paper.

ON Saturday last the *employées* of Messrs. Wyndham & Co., Limited, colotype printers and photographic view publishers, Acton, London, held their annual outing. A party consisting of forty persons left the works in the early morning, journeying in brakies through the country lanes to the Black Horse, Fulmer. On the journey a visit was paid to a fruit garden, and lunch was partaken of, and the enjoyment of a five-a-side football competition by the male portion was indulged in. At the subsequent dinner the chair was taken by the Managing Director, who, in the course of a few remarks, referred to the recent opening of additional departments, and to the fact that two more machines were in course of erection, which he expected would be in working order immediately following August Bank Holiday, and concluded a short address by impressing upon all the necessity of turning out all work in the best possible manner. On the return journey a different route was followed, and home was reached after a most pleasant and satisfactory holiday had been spent.

THE WARWICK COMPETITION.—The following is the list of awards in the Warwick Competition for July:—10*l.* prize, Miss Maude Craigie Halkett, Percy House, Eltham, "We'll be late for School;" 5*l.* prize, F. M. Sutcliffe, Photographer, Whitby. *A Medical Student*; 1*l.* prizes, T. Calder, 14, Broom-law, Glasgow, *Porta del Popola, Rome*; H. Cochrane, jun., Adelaide Park, Belfast, *An Obstacle Race*; Mrs. Dumas, Glascoed, Bromley, Kent, *In Winchester Cathedral*; W. H. Elwood, jun., Malone Park, Belfast, *Sr G. White in Belfast*; Captain F. W. Evans, Riversdale, Ilfracombe, *Ilfracombe Harbour*; Dr. F. Graves, Waverley House, Kenilworth, *Edge of the Forest*; J. R. Gunnison, The Priory, Whitehaven, *On the Shore*; W. C. Hope, Bellevue-road, Cowes, *By Grassy Field and Bubbling Brook*; T. E. Innes, Photographer, Heaton Chapel, Halifax, *A Musical Mite*; W. Ives, 21, Edinboro Grove, Armley, Leeds, *An Ugly Customer*; H. A. Norman, 116, Westminster-bridge-road, S.W., *A Pond in Epping Forest*; J. Patterson, 62, Clifton Park-avenue, Belfast, *Hundred Yards Race*; H. Price, Dennis Vale, Stourbridge, *Lilies of the Valley*; R. R. Rawkins, 5, Alma-road, Canonbury, N., *A Monarch of the Forest*; J. T. Rigby, 66, Belmont-street, Southport, *A Path through the Wood*; F. C. Smithard, 124, Rose-hill-street, Derby, *Evening Sunshine*; F. H. Stevens, 5, King-square-avenue, Bristol, *The Young Student*; S. W. Taylor, 31, Market-place, Penzance, *A Cornish Cottage*; W. Vick, Photographer, Muswell-hill, London, N., *The Green Man Hotel*; C. J. Woodhams, 34, Ship-street, Brighton, *A Rest by the Way*.

Patent News.

THE following applications for Patents were made between July 2 and July 14, 1900:—

CAMERAS.—No. 12,028. "Improvements in and relating to Photographic Cameras." W. J. HOLT.

SHUTTERS.—No. 12,036. "Improvements in or relating to Pneumatic Regulating Mechanism for Photographic Shutters." A. L. ADAMS and W. G. ROBERTS.

STAND.—No. 12,069. "A New Form of Stand for Photographic Cameras." S. E. PARKER.

HALF-TONE WORK.—No. 12,139. "'Backing up machine' for Mechanical Backing up 'Electro' and 'Half-tone Work,' either for Books, Periodicals, or Trade Work." Complete specification. J. COLLIS and T. J. KELLY.

PHOTOGRAPHY ON GLASS.—No. 12,142. "Improved Decoration of Glass Means of Photography." W. A. BONNELL.

HAND CAMERAS.—No. 12,226. "Improvements in Hand Cameras." C. PESENEN.

BOOK FORM KINETOSCOPES.—No. 12,308. "Improvements in Book-form Kinetoscopes." H. W. SHORT and H. E. HUGHES.

PHOTOGRAPHY.—No. 12,313. "Improvements in Photography." Communicated by *Actien-Gesellschaft für Anilin-Fabrikation*, Germany. C. J. ABEL.

REDUCER.—No. 12,375. "Improved Manufacture of a Photographic Reducer." Communicated by *Actien-Gesellschaft für Anilin-Fabrikation*, Germany. C. D. ABEL.

LENSSES.—No. 12,521. "Improvements in Photographic Lenses." H. J. ALDIS.

LENSSES.—No. 12,608. "Improvements in Photographic Lenses." H. J. ALDIS.

SHUTTERS.—No. 12,722. "An Improved Lens-hole for Camera Shutters." R. MARTIN.

CAMERAS.—No. 12,759. "Improvements in Photographic Cameras." Complete specification. T. R. DALLMEYER and H. L. ALDIS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
31.....	Hackney	Chat on Bromide Paper Working.
Aug. 4	Darwen	Excursion: Bolton Woods.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 19.—Mr. A. Mackie in the chair.

MR. PHILIP EVERITT showed two eclipse photographs, one taken by a beginner with one half of a 5½ inch rectilinear lens, equal to about 11 inches focus; and the second with a telescope of 4 inch aperture. In the first the image of the sun was, of course, extremely small, but the second was about three inches diameter.

MR. W. T. WILKINSON passed round four prints from two pairs of negatives developed with pyro-soda and ortol respectively. There was very little difference to be seen between the two pairs of prints.

The question of the peculiar power of metol to attack the skin of some users was brought up. A member described the progress of the attack as first an irritation or itching of the skin, succeeded by the appearance of spots underneath the skin. After a time the skin became so that one imagined it to be at least a quarter of an inch thick. Finally, the hands peeled, and it seemed that one could never use metol again without giving rise to a reappearance of the trouble. Ortol also was said to affect some skins in a similar way.

MR. W. D. WELFORD said that he had never heard of trouble when metol was used in conjunction with hydroquinone. Pyro-metol was said to cause irritation to some people, and hyposulphite of soda, it was stated, gave rise to blisters in some instances. Allusion was made in a conversational way to the new kachin developer. When first introduced, caustic alkalies were prescribed for it. The new kachin, it is said, has been modified for use with carbonates instead of the caustic alkali, but it was pointed out that excellent results had been obtained with the first kachin used with carbonates.

MR. A. HADDON, replying to a suggestion that ozotype, the carbon process now commercially worked, was comparable to the old process of Marion, said that they were as different as wet and dry plate processes. A general discussion ensued on this as well as other topics.

PHOTOGRAPHIC CLUB.

JULY 18.—Mr. H. Müller in the chair.

MR. E. W. FOXLEE showed a quarter-plate negative taken by an amateur forty-five years ago with a single lens. Notwithstanding the great improvement in lenses that had taken place since that time, he thought everybody would perceive that the lens used was an excellent instrument, the absence of distortion being as complete as with the best lenses of to-day. He believed that the focus of the lens was about six inches.

MR. A. MACKIE remarked that a single lens used properly did not really distort much. He had a whole-plate negative taken with a single lens of about nine-and-a-half inches focal length. Looking directly at the negative or print, a certain straight line in the subject appeared as it should, but held at an angle one could distinctly see the curved line produced by the distorting lens.

MR. FOXLEE said, of course, the plate used was a wet plate. The subject was a street scene. A glass positive made similarly many years ago, was also shown. Some discussion ensued as to the length of focus of the lens used, judging by the width of the street, and the rendering of the view.

MR. MACKIE thought it likely that the lens was the front glass of a 4-plate portrait lens.

North Middlesex Photographic Society.—July 16.—Mr. A. H. WALL
gave a lecture on
CLOUD NEGATIVES.

The lecturer dealt with the various forms of clouds, and the relative exposures required for the various forms. He touched on the work of Claydon and Birt Acres, saying that their work was scientific, and not intended for pictorial purposes. The use of a Claude Lorraine mirror was explained, and a simple substitute, which the lecturer had found efficacious in his hands, was described. A thin ground-glass focussing screen, half-plate size, was coated with black varnish on the ground side, and mounted on one side of the lens at an angle of 33° to it. The blue of the sky was polarised by reflection from its polished surface as in the mirror, and no double image was obtained.

FORTHCOMING EXHIBITIONS.

1900.

- August 21..... Royal Cornwall Polytechnic Society. W. Brooks,
Laurel Villa, Wray Park, Reigate.
- Sept. 21-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly.
Hon. Secretary, R. W. Craigie, Camera Club,
Charing Cross-road, W.C.
- October 1-Nov 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- November 12-17 Ashton-under-Lyne.
- ," 21-23 Hackney Photographic Society.

1901.

- January 14-19 Blairgowrie and District Photographic Association.
The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE CONVENTION GROUP.

To the Editors.

GENTLEMEN,—Please allow me to heartily thank you for the supplement to the JOURNAL this week. I purpose mounting and framing such, although I am not a member of the happy party.

May I offer a suggestion, which I think would be much appreciated by the readers of your valuable paper, i.e., a supplementary sheet of the Editor and staff (if he wills) of the JOURNAL that might go side by side with other such publications? I should feel it a great honour to possess.

—I am, yours, &c., AUGUSTUS H. TAYLOR.

19, Rolle-street, Exmouth, July 21, 1900.

[We are glad to know that our correspondent appreciates the Convention group, which reflects the greatest credit on Mr. W. Parry, who took the negative. The suggestion shall be borne in mind.—EDS.]

SOUTH LONDON SOCIETY'S EXCURSION TO THE RHINE.

To the Editors.

GENTLEMEN,—I have much pleasure to inform your readers that we have permission to photograph interiors in Cologne Cathedral, St. Gereon's Church, Cologne; Munster Church, Bonn; and Remagen Church.

Those wishing to join this excursion should send me 2*l.* 10*s.* towards travelling expenses by Saturday next, July 28.—I am, yours, &c.,

5, Firs Parade, High-road, Lee, S.E. WILLIAM F. SLATER.

KODAK DEMONSTRATIONS.

To the Editors.

GENTLEMEN,—We beg to inform you that we are now arranging for demonstrations in connexion with the following subjects during the ensuing winter:—Development of rollable film; Dekko paper demonstrations; Panoram photography, illustrated by examples.

If you will kindly give publicity to the above in the columns of your esteemed journal, together with an intimation that we shall be pleased

to arrange dates for these demonstrations with the secretaries of photographic societies, we shall be much obliged.—We are, yours, &c.,

Head Offices : 43, Clerkenwell-road,
London, E.C., July 16, 1900.

KODAK, LIMITED.

SPECIMENS.

To the Editors.

GENTLEMEN,—I have subscribed to your very useful publication for a number of years, during which time I have seen frequent complaints made by operators about loss of specimens and delay in their return.

I have fortunately not been "out" much, but as soon as I have occasion to send specimens in reply to one of your advertisers just so soon do I get such cause for complaint that I swear I will never again send specimens to another advertiser. I have kept this vow for two or three years so far as replying to a number care of JOURNAL, but when a man is out he must try something; therefore I am forced to reply and send specimens, and, I regret to say, absolutely always with the same result, viz., I have to write at least once before I get them returned. I could name firms from whom I never get them back at all, the publication of whose names, I fancy, would rather surprise the trade generally, and, if I do get them back, it is never under two weeks, but often three or four. I have heard all the excuses made on behalf of the advertisers, such as that they are often inundated with amateurs' trash, which is certainly annoying and, no doubt, in such cases expensive! but surely an "operator" has not to suffer for that. When I say "operator," I mean a really proved good worker, like myself. I may here mention that I have never worked for less than three guineas for over three years, and successfully too. Why, then, should employers, advertising, have so little regard for any really good man who takes the trouble to submit specimens? In the case of third-rate advertisers—but the wording of whose advertisements would lead one to believe they are Lafayettes or Langfiers of the first water—there might be the suspicion that they wanted to sneak them for their own use; but in the case of really first-class firms such an excuse does not exist, therefore, if anything, their case is even worse than the first, for with them it is purely a case of downright selfishness; they decide on a man, and are themselves satisfied, and are then utterly regardless whether or not the rejected applicants have another set of specimens to send out the next week should the necessity arise. I am so disgusted now that I have decided to start business on my own, so, so far as I am concerned, I need hardly worry. Yet there are no doubt dozens, perhaps hundreds, of brother-workers who are not so luckily situated as regards £ s d as I am, and who, if they do not get their specimens returned by the following Friday, may lose perhaps the very situation most suited to them, and therefore go idle for goodness only knows how long.

It is for these men I now make this my first and last appeal. Any advertiser, unless he is a consummate ass, can surely decide in at most one day which are likely and which are useless applications; his duty then is very clear, viz., return the rejected at once. Why keep them up one hour? And then, if within the week he cannot make every necessary inquiry regarding, say, the half-dozen he has considered likely, and make a choice, and return the specimens of the other five, well, then, he ought never to have been in a studio at all; such men should be running a small washing and dressing establishment.

You, as a rule, are very fair and desirous of keeping both advertisers and applicants right, but apparently have not yet devised a cure for this very common and unnecessary complaint. To further my appeal I here-with submit a remedy which I think would be effectual and at which, if due notice was first given by you through the JOURNAL, no decent firm could object, and—well—the other kind want showing up. Why not publish a black list of all advertisers who keep an applicant's specimens and copy testimonials more than one week—or two if you think—but let it be definite. No doubt, all applicants would be glad to inform you of defaulters.

Lawyers, stockbrokers, and members of many other high-class professions are immediately hauled over the coals if in default, why then should photographers escape the penalty of such petty meanness. There is always some extenuating point in the case of a man—say a stockbroker—who cannot come to the scratch on settling day, but in the case under consideration there is absolutely none.

No doubt you acknowledge receipt of all advertisements, could you not at the same time inform your customers of the black list now in vogue, i.e., if you adopt my proposal. If not, all I can say is, poor operators.

Both defaulters' and complainers' names could be listed, and if it was thoroughly understood that advertisements were only inserted under these conditions there could surely be no liability on your part.

When I am at it I might also suggest that advertisements should be classed 1st, 2nd, and 3rd, for as it is the 3rd, aye, and often the 4th grade advertiser asks for a first-class man, when they have not the slightest notion of paying more than 30s. per week, what earthly good is it to them then getting specimens from men whose work at once shows them to be far above the advertisers' standard and what is more galling to a really first-class man than to have to wait three or four

weeks for the return of his specimens and then receive same in a thin tissue envelope with great vulgar printing all over the face of it, much more suggestive of a vegetable store than anything connected with art; this classifying of advertisements would also often prevent third-rate men applying to really first-class houses.—I am, yours, &c.,

July 24, 1900.

MAN'S INHUMANITY TO MAN, &c.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

N. Budd, 40, Lichfield-street, Wolverhampton.—Photograph of a memorial brass tablet.

J. Kennerell, 7, York-row, Wisbech.—Photograph of Wisbech fire engines, escapes, and fireman.

G. W. Tottem, 6, The Boulevard, High-road, Balham.—Photograph of Dan Leno and others on cricket field. Photograph in railway station of Oronhyatekha, M.D., and others.

W. B. (Hull).—Many thanks; it is a curious advertisement.

HOT-WEATHER TROUBLES.—W. BLAKE, R. W. C., AMATEUR, and others. See remarks on the subject in another column.

WILLIAMS.—We regret very much that we cannot at present offer a suggestion likely to be of service, but we will keep your letter before us.

BOOK ON ENAMELS.—J. BRANDEBOURG asks for the name and publisher of a book on vitrified enamels.—In reply: Messrs. Dawbarn & Ward, of Farringdon-avenue, E.C., publish such a book.

ETCHING PROCESS.—A. D. BISHOP asks: "Is it possible to prepare a polished silver plate with suitable ground, print thereon a photo, and etch with nitric acid?"—Yes, if you use the bitumen process, but that is only suitable for fine work.

STAINS ON PRINTS.—R. M. writes: "Will you kindly inform us what is the cause of the stains on the prints enclosed. We had three or four in the last toning, but this toning about seventy-five per cent. are as enclosed."—This is another case of imperfect fixation. See answer to Helio.

JOHN FLYNN (Johnstone).—The apparatus you describe is the invention of Mr. L. Nievsky, Avenue-road Villas, Shepherd's Bush, to whom you had better write for further particulars. We sat to it some few years ago for our portrait, and the results were expeditiously produced and satisfactory.

PHOTOGRAPHING IN THE NATIONAL GALLERY.—The Secretary. But we may tell you that amateurs are not allowed to photograph in the National Gallery. Permission is given, occasionally, to professional photographers, but they have to specify the purpose for which the work is required before it is accorded.

RED STAINS ON PRINT.—P. CHARLETON asks the cause of red stains on enclosed print before toning; one half the print will be blue, the other red. He has been greatly troubled with it lately and cannot find out the cause.—So far as we can judge from the print the paper appears to be unevenly coated. Expose a sheet to a weak light and see if it darkens evenly all over. If it does not return it to the maker.

SPOTS ON PRINTS.—SPOTS writes: "Please enlighten me in the next issue of your paper, the cause of the spots on the prints which I enclose. The spots only appear when washing and toning. I have never had such an occurrence before the last two packets."—The spots are caused by particles of foreign matter in the washing waters, which have reduced the silver in the paper to the metallic state. They look like particles of iron, and probably are.

FORMULA FOR DEVELOPER.—W. K. writes: "Will you kindly give me what you consider the very best formula for very short exposures, say from 200th to 800th of a second? One containing pyro preferred."—If pyro is preferred use the solution weak with a minimum of bromide, and allow plenty of time. Some consider that metol will bring out more detail than pyro in under-exposed plates. A formula for that is given on p. 1021 of the ALMANAC, but use it diluted somewhat.

THE PENNY PICTURE BUSINESS.—H. W. POST writes: "Can you inform us whether or not what is known in America as the 'Penny Picture business' (a dozen pictures for a shilling or sixpence), has been carried on to any extent in England? Information on this point will oblige us, and your kindness will be greatly appreciated."—Presumably stamp portraits are referred to. These portraits are produced here as low as twenty-five for a shilling at some places, but the demand for them is but limited in this country.

RESTORING ALBUMEN PRINT.—If a gold toned print be immersed in a solution of bichloride of mercury, the yellowness will be removed. That is the method you doubtless have heard of. If the print is not gold toned the image as well as the yellowness will disappear. Such would be the case with a bromide picture for example.

STRENGTHENING METHYLATED SPIRIT.—B. G. writes: "I want some methylated spirit stronger than that sold at the shops, and I know I can make it stronger by distilling it from carbonate of potash, or quicklime but that necessitates the use of a still. Will you please say what the license to use one would cost?"—The license for a still is ten shillings a year, but you will not be allowed to use it for strengthening methylated spirit, for that is illegal. Methylated spirit must not be tampered with. If it is a heavy penalty is incurred.

SENSITISING CARBON TISSUE.—CARBONSIS writes: "I have just bought a roll of carbon tissue, and I find when I sensitise it that the coating comes off everywhere it is touched by the fingers. Although I have been using the carbon process for some months I have never met with this trouble before, so it must be the fault of the tissue. Should I not return it?"—No; the trouble is due to the hot weather. Keep the sensitising solution below 60° by the aid of ice, and the trouble will disappear.

A QUESTION OF COMPENSATION.—VERNON BIRD, of 3, Cannon-street, Wisbech, writes: "Seeing in your Answers to Correspondents of July 20 that 'G. F.' writes to know 'A Question of Compensation,' would you be so kind as to let me have his address, as I should like to write him to know if it is the same firm as I have been trying to deal with. On February 8 I gave an order for a greenhouse to use as studio to —, and sent cash; during that time they have frequently said same was coming. The last letter I had from them is about six weeks ago. Have written in meantime, and they don't reply. On their price list they say, 'Cash returned if required.' But they won't send either."

BROMIDE ENLARGEMENTS.—B. & Co. write: "Will you please tell us the cause of the cold black and white tones in the enclosed pieces of enlargements? They are made on — bromide paper. We used to send our enlarging to —'s to be done, but the time taken and the cost of carriage has induced us to try and do it ourselves, but we cannot get the same colours that — do."—The pictures of pictures sent show that the exposures were wrong, in most considerable under-exposure. To get the best results with bromide paper the exposure must be accurately timed, or the colours will not be warm and rich. Knowledge of the proper timing can only be gained by experience. That, of course, those to whom you have hitherto sent the work have gained.

A QUESTION OF COMPETENCY.—T. ROBERTS writes: "I advertised in THE BRITISH JOURNAL OF PHOTOGRAPHY for a first-class operator and retoucher. I had one application from Ilfracombe, and one from Ireland, both men represented themselves as first-class men at operating and retouching. Neither of them could retouch, and their operating was very indifferent. The one I gave a trial for a week, the other one I sent off after four days, giving both every possible chance. Am I bound to pay such men wages?"—We should suppose so, unless they agreed to come on trial without payment. Of course you need not pay them if they came with false references, for of course you did not take them without some reference.

STAINED PRINTS.—HELIOS writes: "Can you enlighten me as to the cause of the stains on enclosed prints? Paper is Trapp's best; silver, Marions. Every care and cleanliness; well washed by hand, and rosed. These prints were well hand washed and rosed for one hour, and left standing in water from Saturday night to Monday morning. Same effect, but more prints affected, is caused when prints are left in running water all night. Large print is an extreme case, and cabinet a normal case. My photographic friends cannot explain cause, and I am mystified. Of course I cannot say that my printer is truthful, but he appears to take every care, and is anxious."—The prints are simply not fixed. Either the hyposulphite solution was far too weak, or the prints were left in it for much too short a time. A stronger solution and a longer immersion is the only way of avoiding the trouble in future.

PRECIPITATING SILVER RESIDUES.—UUBE writes: "Please pardon my inquiry for information on what has been a simple matter with us for nearly forty years, and which gave us no trouble until quite recently—namely, the precipitation of silver from print washings. Until a few months ago we managed to precipitate effectually with chloride of sodium, and occasionally a few drops of hydrochloric acid, but now we cannot get the silver liquid settled. I am afraid our printer does not clean out the dishes every time the water is run off. Would that be sufficient to account for the difficulty? or may ready-sensitised paper be the cause? and could you kindly suggest a remedy?"—The silver in the washings from ready-sensitised papers does not precipitate so readily as it does for paper of one's own sensitising. Neither is there so much silver in them to precipitate. The best way to get the silver to subside is to precipitate it with hydrochloric acid. After the acid has been added, well stir up the residue, or otherwise agitate it. We do not think the want of cleanliness of the dishes has anything to do with the trouble.

* * Great pressure on our space obliges us to hold over our Paris Exposition Notes, several reviews of apparatus, &c., and other matter.

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EX CATHEDRÀ.

WE have this week received the annual report of the Photographic Club for the years 1898–99. It extends to over 140 pages, and covers the records of the Club from November 17, 1897, to November 1, 1899. One of the earliest papers printed in its pages is on the subject of the "Gum-bichromate Process," by Mr. James Packham. Other notable matters that have been treated of before the Club during the past two years are "Electricity and Optics," by Mr. A. W. Isenthal; the "Woodbury Process of Lantern-slide Making," by Mr. J. R. Williams; and "Photogravure," by Mr. A. Ernest Smith. The book is full of useful information on practical photography, and, as we turn over its pages, the echoes of many a pleasant meeting are borne in upon us. The Photographic Club, it may be remarked, was established in 1879, and thus it comes of age in the present year. So far as London is concerned, it ranks as one of the oldest photographic institutions. The attainment of its majority should give the Club the opportunity of celebrating in some fitting manner so interesting and rare an event in the history of photographic societies.

DURING the approaching autumn and winter, lantern slides of the Paris Exhibition will, no doubt, be in considerable demand for optical projection entertainments—that is if the disturbed state of the world's affairs does not, as was undoubtedly the case last winter, entirely dislocate this branch of photographic industry. The veteran photographer, Mr. Frederick York, was very busy with his camera at the Paris Exhibition early in the year, and we understand that his firm has ready for the market a set of lantern slides to the number of about seventy, illustrating the principal features of the great show. Accompanying the slides is a book of reading matter tersely describing introductory views at Dieppe and Rouen, and then plunging the hearer at once into the glories of the Exposition. Messrs. York's address is 87, Lancaster-road, Notting Hill, W., and the reading book we are noticing may be had at the cost of one shilling. Seventy slides with the lecture before us will make an entertainment of not excessive duration. A glance through the list of slides assures us that none of the principal external features of the Exhibition have been omitted, although the photographer, so far as interior views was concerned, was necessarily restricted in his scope of work.

* * *

THIS month one of the American photographic societies makes an ambitious departure in respect of an exhibition. It appears that the Chicago Society of Amateur Photographers proposes to hold a Photographic Trades Exhibit in Chicago, August 27 to September 1 inclusive. The chief object of this Exhibit, we are told, is to call attention to the great improvements which have been made in photographic apparatus and materials, and to show what is latest and best in everything pertaining to it, including cameras, lenses, shutters, plates, papers, films, albums, chemicals, books, periodicals, sensitizers, developers, colour-photo apparatus, steoicons, view-finders, intensifiers, reducers, flash lamps, flash powders, pastes, mounts, colour screens, exposure meters, ruby lamps, lantern slides, tripods, trimmers, &c., as well as the best work of all photographers, professional and amateur, commercial and scientific. The date selected is that upon which the National Encampment of the Grand Army of the Republic will be held in Chicago. At this time a large number of strangers will be

in the city. In Chicago alone there are 60,000 amateur photographers. We quote these details from the *American Journal of Photography*. The Chicago Society has undertaken a plucky thing in running a photographic trades exhibition, and we hope success will result. Promoters of trade exhibitions in England run risks which it is to be trusted do not trouble the Chicago Amateur Society.

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AMONGST our recent visitors we have had the pleasure of including Mr. T. Baker, the managing director of Messrs. Baker & Rouse, Limited, photographic dealers and manufacturers, of Sydney, Melbourne, Adelaide, and Brisbane. After fifteen years' close attention to business, Mr. Baker is taking a holiday in the Old World for a few months, but is not neglecting the opportunity of adding to his photographic experiences. We wish our visitor a pleasant and useful holiday. We learnt from Mr. Baker many interesting details concerning the condition of Australasian photography. In professional circles keen price-cutting prevails. Amongst amateur photographers American-made hand cameras are popular. Climatic conditions render dry-plate making an extremely hazardous undertaking, the contents of a drying room being frequently attacked by fogging influences, due to external atmospheric variations impossible to guard against. Perhaps in Australasia photography has not yet reached its highest developments ; at present it is necessarily a limited industry. But, with the new order of things that has recently been inaugurated, we may fairly hope that camera work will share in the general advancement.

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At a recent meeting of the Photographic Society of Philadelphia, we are told in the Society's *Journal*, an interesting series of slides and prints illustrating the methods employed in photographing the solar eclipse were shown. One worker's negatives were made with a twenty-one-inch lens, on Cramer Iso. backed plates, and through a bichromatic cell. The exposures were all the way from one-hundredth of a second at $f\cdot30$ to one-quarter of a second at $f\cdot7\cdot5$. It was partly cloudy sometimes, but, so far as could be seen, the exposure made no difference whatever, except that one showed a perfect sample of reversal. In the course of some remarks Mr. Carbutt said that he had made special plates for several astronomers, including some one-sixteenth of an inch thick "B" emulsion, and others double and triple-coated and backed. He had developed some of the plates, and found that the "A" double-coated produced the best results. The best developer was metol hydroquinone or metol alone, very much diluted. One sentence in Mr. Carbutt's observations is of distinct interest, viz., that in which he refers to the production of sensitive gelatine films one-sixteenth of an inch thick. It is not often that one hears of such extremely thick gelatine bromide films.

* * *

PHOTOGRAPHERS will be interested in the election a few days ago of Mr. Joseph Wilson Swan, F.R.S., to the Presidency of the Society of Chemical Industry for the ensuing year. His predecessor was Professor Charles F. Chandler, of New York, who at the recently held annual dinner of the Society referred to the fact that for the first time in the Society's history the Council had filled the presidential chair with a non-resident from over the sea, who lived at such a distance

that it had been impossible for him to take part in the administration of the Society's affairs. It may be noted that Professor Chandler's name appears on the title-page of our excellent contemporary, *Anthony's Bulletin*, as one of its editors.

EXHIBITIONS AND EXHIBITORS.

EXHIBITIONS and all connected with them possess a fascinating interest to a substantial part of the body photographic. When there is nothing else to live for, the winning of the elusive medal forms many a camerist's sole *raison-d'être*. As being hung "on the line" at the Academy seems solace to the palterer for years of weary, soul-absorbing toil, so an award at, or even a place on the walls at, the Royal is the gilded dream of his brother worker.

Many a line has been written, mostly by those who have not won them, against the giving of medals or awards of any kind. We are told how they inevitably lead to the production of work that is likely to satisfy the fashion of the hour and the whims of the Judges, rather than representative of its creator's best thought and ideal. Perhaps there is some modicum of truth in this. Take any particular exhibition, bear in mind the special points in which the Judges excel, or are known to take an interest, and it will be found that quite a remarkable number of pictures calculated to please them are shown. It is a well-known fact that many exhibitors take pains to ascertain the personality of the Judges before sending in their work, and it is difficult to think out any really forcible reason against such a course, so long as the standard chosen is a good one and mere imitativeness is avoided.

Still, no doubt there is a certain drag placed on freshness and originality by the way things are managed at present. Some thoughtful minds have been wondering whether it would not be much better if the identity of the Judges were concealed till the opening day. A few of these Daniels themselves are rumoured to be privately of the same opinion.

The flattery of imitation does not appeal so strongly to them as might be expected. No doubt, a feeling of weariness grows on them at seeing so many attempted parodies of their own cherished works. Perhaps this explains in some sort why it is so often the unexpected that has happened when the awards are published. The fresh and unhackneyed is bound to appeal to the Judges with greater force than the technically better, but less original, works that the public admire, and so it comes to pass that the latter criticise the awards and speak enviously of certain people's "luck."

Would the discontinuance of awards have a depressing effect on exhibitors, resulting in fewer pictures being shown? It is difficult to say. Possibly it might be deterrent to the more ambitious, and some whose sole object in exhibiting is the capture of medals. But what about the rank and file, who scarcely dream of winning them, but follow pictorial photography from simple love of it? There are no awards at the Royal Academy, yet it can hardly be said to lack pictures for the hanging. Of course, it is well known that the mere presence of one's work there is reward and honour sufficient, so that the comparison is scarcely fair.

The amount of heartburning and jealousy aroused over the distribution of awards at some photographic exhibitions is, unfortunately, only too familiar to those who have been behind the scenes. It is this, as much as anything, that has caused

many a lingering doubt as to whether the abolition of such distinctions would not be better for everybody's peace of mind. Certainly a clever and skillful worker will make his name without the aid of any of these meretricious trappings, and a photographic reputation is not won or lost by their possession or non-possession. Still, what is life without competition? It seems to be the universal law, ending in a sort of artistic "survival of the fittest." Many a name now revered in photographic circles would, perhaps, have remained in contented obscurity had it not been for some incentive to effort gained in friendly rivalry for the prize. *Qui non proficit deficit.* Where emulation fails to stir us to the showing forth of our best ability we fall behind, losing even what we have.

Who would have ventured to anticipate, say five-and-twenty years ago, the great popularising of photography that has taken place, the spreading of the network of societies from town to village, the passing acquaintance which even "the man in the street" now possesses with what was then so esoteric and difficult? Many good traits and qualities have their birthplace and nursery in these meetings together of brother workers, as, for instance, the benevolent and kindly interest that is always taken in the difficulties of the beginner, and the ungrudging way in which the more experienced place their knowledge at his disposal.

There is an amazing amount of recreation offered by these societies in the shape of excursions and trips, nominally for the purpose of photographic work amid the beauties of nature. It is a curious fact, however, that most workers confess they have never turned out anything remarkably brilliant as a direct result of these gregarious rambles; their best efforts, almost invariably, being the product of solitary journeyings. It might be deduced from this, perhaps, that photography is a pursuit favoured by loneliness, and not satisfactorily practised in a crowd. Sociability seems inimical to it, and yet, as a contradictory truth, we find its devotees the most sociable of men.

With the multiplication of societies has come, as a natural consequence, many an addition to the number of our shows and exhibitions, till it would now require an excellent memory to bear them all in mind. What an amount of human interest centers round each one of them! Consider the many troubles and failures that go to the making of a single successful picture: the dozens—nay, hundreds—of spoilt plates and quires of wasted paper, from which emerge, as butterfly from chrysalis, the finished beauties of an exhibition.

The work of judging the pictures is very tedious, calling sometimes for the exercise of considerable patience, especially when the classes are few and exhibits many. The judicial labours are, however, generally lightened by all that courtesy and tact on the part of the authorities concerned can accomplish. Still, mingled with their usual pleasant experiences, the Judges have often unwelcome reminders of the innate imperfection of humanity in the shape of unblushing canvassing by some of the competitors.

It is hoped that this is gradually dying out, and that the state of things which permitted an exhibitor to button-hole a Judge and lead him unresisting round the room, pointing out the while the merits and beauties of his (the exhibitor's) pictures, is becoming an impossibility. Certainly the exhibition atmosphere is cleaner and less open to reproach than, according to the reminiscences of some of us, it used to be.

Is anything gained by the great number of shows we now

have? Would not their purpose be better served, and their sphere of usefulness widened, if they were fewer and farther between? County exhibitions, for instance, to which a numerous group of societies would contribute, and which should be held in some large and central hall in the county town, would probably prove more attractive than the many smaller shows individually. London and other large cities might arrange for frequent imposing displays in such a building as the Crystal Palace, on the excellent lines of that organized some time ago by the Royal Photographic Society. This centralisation would tend, no doubt, to give to photographers a broader range of thought and greater *esprit de corps*. The latter quality is at present, alas! by no means so evident as it might and should be.

It is interesting and amusing to take up some of the old exhibition prospectuses, and notice how curiously different are the regulations and instructions, both in letter and in spirit, from our latter-day directions.

Those were the times when wide-margined mounts, of white or some light colour, were the order of the day, and Oxford and gilt frames were enjoined rather than prohibited; when highly burnished silver prints were the admired ideal, even on the walls of Pall Mall, and pictorial photography, as we now know it, was but a wailing infant.

The little circle of the Salon cannot fairly claim to have had much hand in this change for the better, which must be credited to the general raising of British art standards. The Salon, moreover, has certainly shown marked ability to profit by the many examples of technical perfection which the sister show has afforded. These two groups of diverse intentions and interests have played the part, as it were, of Ministry and Opposition.

And so the world progresses; the changing of the old order, the unperceived and stealthy advance of the new—here before we know it, and going as quickly. "Art is long"—long in pursuit, long in attainment—but all well-directed effort leaves some beneficial impress that defies even fleeting time.

The Uranium Mystery.—The scientific world has been greatly agitated by the announced discovery of sundry remarkable new elements possessing the power of emitting Becquerel radiations of immense power and for indefinite periods of time. M. and Mde. Curie, with also M. M. G. Belmont, have made most of the investigations referred to, and have undoubtedly been instrumental in preparing chemical substances possessing most marvellous powers of emitting radiations, capable of passing through metal sheets, and then affecting photographic dry plates. Still, they have not so far been able to separate a particular body and exhibit it as a sample of the new element, the polonium or the radium as the case may be. They have shown mixtures containing the assumed new element, and they have proved the existence of a new spectral line emitted by these mixtures. In an article by Béla v. Sengyel, recently translated by the *Chemical News*, from a communication from the chemical laboratory of the Buda-Pest University, the writer says that "it can scarcely be maintained that chemical elements exist which are in no way distinguishable from other well-known ones except in radio-activity." He set to work to discover whether these new elements really do exist or not. Naturally the photographic interest of substances capable of acting through opaque bodies of metal is equally great whether they be elementary or not, but at the same time real progress with them can only be made by setting all these questions at rest. It is not necessary for us to describe in detail the methods adopted by this investigator, and we will merely sum up his results by saying, that he came to the conclusion that

the claim for the position of elements could not be maintained on the grounds that they were actually able to transform ordinary salts of baryta into "a radio-active form which apparently possesses all the properties of the radio-active barium observed by different experimentalists. I have, so far, prepared three compounds, radioactive barium, sulphate, and from this the chloride and carbonate." It will be interesting to await developments.

Neglected Genius.—We have all read how the Chinese discovered gunpowder, the Ancient Egyptians the hand magnifier, that Columbus did not discover America, and so on, and, according to the *English Mechanic*, there are reports of another native genius languishing in obscurity, and who has only just been discovered by the Paris Automobile Club. The claim made for him is very comprehensive but rather vague. Besides, having patented and actually worked, in 1860, the first Automobile, he is credited with being the author of many other inventions, including the enamelling process in general use for tinning various utensils, an electric brake, and various chemical applications in galvanising metals, and in photography, all of which have been taken up by the trade, perfected and turned to valuable account. He is stated to have made neither money nor reputation out of his inventions, and as the worthy inventor, Etienne Lenoir by name, is now ninety-eight years of age, it is to be hoped that, if some definite claim for his services in connexion with photography is put forward and proved, photographers also may follow suit with the Automobile Club, who intend that "recognition, though tardy, shall be paid to the aged inventor's talents."

Acetylene Purification.—The great importance attached to the use of acetylene is attested to by the large number of investigations upon the best methods of purifying it that have been published in the technological journals. There is one singular point about these articles: no sooner does one process get published than it is at once written down by the upholders of another. We have already given details of the most important as they have appeared in print, the most prominent, perhaps, having been the Ullmann chromic acid process. It may be said that there is plenty of room for improvement, as there are few installations of the gas where its presence is not unmistakably felt by the olfactory organs. The chromic acid process acts by destroying, by oxidation, the offensive gases, and not, as in Franks' process, precipitating them, or rendering them non-volatile. Dr. Wachs has made laboratory experiments, and finds Ullmann's method perfect; he publishes the before and after condition of the gas, accompanied by particulars of the rate of flow and the lighting power after treatment. Dr. Lundstrem reviews a number of these processes, and gives details of what there is in the gas that has to be got rid of. For practical purposes of every-day life, it is evident that interest almost entirely centers upon getting rid of the evil-smelling components, though it is evident that the presence of impurities that might lead to the production of explosive compounds must not be lost sight of. He states that, in a general way, there is about 0·5 per cent. of other gases present in acetylene as ordinarily made, the most objectionable being sulphuretted, phosphoretted, and arseniuretted hydrogen. The users of small generators may take comfort from Dr. Lundstrem's statement that "in actual practice nearly all the impurities are absorbed by lime water, and a simple washing with water will even suffice, unless the gas contains a large quantity of phosphoretted hydrogen, in which case a more complete purification will be necessary."

ON THE CONSTRUCTION OF PHOTOGRAPHIC OBJECTIVES.

[Reprinted from the *Journal of the Royal Photographic Society*.]

THE first person who attacked the problem of the construction of photographic lenses on scientific principles was Professor Petzval of Vienna University, 1840, who will always be remembered in connexion with the portrait lens which bears his name. My object this evening will be to endeavour to give you some idea of the nature of

the theory as developed by him, and also to show how it may be applied to the construction and simplification of photographic objectives.

In the first place, it is necessary to dismiss from our minds the view that a photographic objective or, in fact, any optical system is composed of lenses. The real fundamental units of any optical system are spherical surfaces separating homogeneous refracting media, and an ordinary single lens is simply a piece of glass bounded by two of these surfaces. Further, we always suppose that an optical system is centered, i.e., the centres of the spherical surfaces of which it is composed are all ranged along a straight line called the axis of the system.

Since, again, all objects are seen or photographed by means of the pencils of light rays emitted from each point of them, our first business must be to investigate the nature of the action that takes place when one of those pencils of light is refracted at a spherical refracting surface.

Petzval shows that this action can be conveniently separated into five parts which we call as follows:—(1) Spherical aberration; (2) Coma; (3) Astigmatism; (4) Curvature of field; (5) Distortion. And the essence of Petzval's theory is that, for an optical system composed of any number of surfaces, the total effect is simply

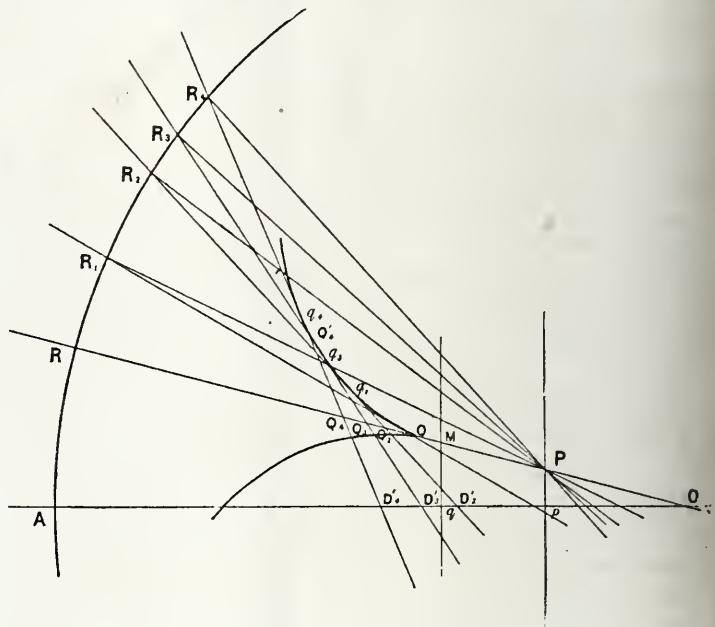


FIG. 1.

additive, i.e., the total spherical aberration is the sum of spherical aberrations due to each surface, and so for the coma, astigmatism, curvature, and distortion.

Considering now a single surface centre O (fig. 1). Let AO be the axis of the system cutting the surface at A, which we call the vertex of the surface. Let P be any point on the image emitting rays of light in all directions. Let OPR be the particular ray which passes through the centre of the surface. This ray, we know, after refraction passes on unchanged in direction, all other rays are refracted or bent from their original direction when they meet the refracting surface.

Consider, first, rays lying in the plane AOP, which we call the primary plane. After refraction these rays will still remain in the primary plane, but these rays after refraction will no longer pass through a point, but will touch a caustic curve $Q_1 q_2 q_3 q_4$, the marginal rays of the pencil such as PR₄ coming to a shorter (or longer, as the case may be), focus Q₄R₄, than the central rays of the pencil PR₁. This well-known effect is described as spherical aberration, and, as a measure of the spherical aberration, we take the rate at which the focus Q₄ recedes from the geometrical focus Q as the angle RPR₄ increases.

We next come to the consideration of what we call "coma." In the previous figure we supposed that rays of light were proceeding in all directions from the point P, but in practice the rays of pencils

We have thus seen how these five aberrations arise in the refraction of a pencil at a single spherical surface. Now, as Petzval shows if a pencil of rays from a point on the object be refracted by an optical system consisting of any number of such surfaces, the—

1. Spherical aberration of the emergent pencil is measured by
 ΣL_n

2. Coma of emergent pencil is measured by
 $\Sigma L_n \xi_n$

3. Primary curvature of image is
 $-\Sigma U_n - 3\Sigma L_n \xi_n^2$

4. Secondary curvature of image is
 $-\Sigma U_n - \Sigma L_n \xi_n^2$

5. Distortion of image is
 $\Sigma U_n \xi_n + \Sigma L_n \xi_n^3$

Where L_n is the spherical aberration of the n^{th} surface, ξ_n is a measure of the obliquity of incidence on that surface of the axis of the pencil and $U_n = \frac{\mu_n - \mu_{n-1}}{\mu_n \mu_{n-1}} \rho_n$, ρ_n being the curvature of the n^{th} surface. Hence, if the emergent pencil is to be perfectly free from spherical aberration, coma, and astigmatism, and if the image is to be plane and non-distorted, we must satisfy the five conditions:

1. $\Sigma L_n = o$ (Spherical aberration).
2. $\Sigma L_n \xi_n = o$ (Coma).
3. $\Sigma L_n \xi_n^2 = o$ (Astigmatism).
4. $\Sigma U_n = o$ (Curvature).
5. $\Sigma \xi_n (U_n + L_n \xi_n^2) = o$ (Distortion).

The quantity ξ_n , as we have said, measures the obliquity of inci-

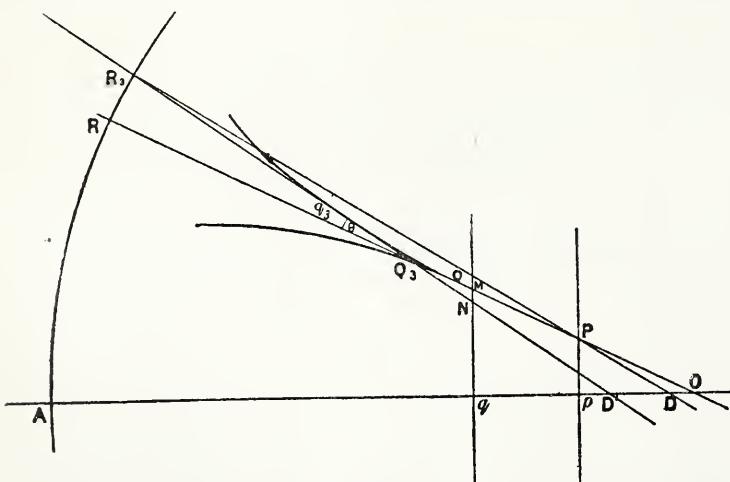


FIG. 3.

dence on the n^{th} surface of the axis of the pencil forming the image; in other words, the form of the above equations will depend on the position of the stop which we take to limit the incident pencils. But we shall find on taking the general case that, if we satisfy the equations for any assumed position of a stop, they will also be identically satisfied for any other assumed position. Hence we may evaluate the quantities ξ_n for any arbitrary position of a stop we please, and it is usual to take this arbitrary position to be at the vertex of the first surface.

The exact values of $L_n \xi_n$ and U_n may be put into various forms. One of the simplest is as follows:—

Let the refractive indices of the various media be successively $\mu_0, \mu_1, \dots, \mu_n$.

the curvature of the n^{th} surface ρ_n ,

the vertical thickness of the n^{th} medium $\mu_n \tau_n$,

and putting $\kappa_n = (\mu_n - \mu_{n-1}) \rho_n$,

let the successive convergents, formed in the usual way of continued fraction,

$$\frac{1}{\kappa_1} + \frac{1}{\tau_1} + \dots + \frac{1}{\tau_{n-1}} + \frac{1}{\kappa_n}$$

be successively

$$\frac{a_1}{b_1} - \frac{a_2}{\beta_2} - \frac{a_2}{b_2} - \frac{a_n}{\beta_n} - \frac{a_n}{b_n}$$

and let the distance from the object of the first surface be $\frac{1}{u_1}$

Then $L_n = (a_n \mu_0 u_1 + \beta_n) (A_n \mu_0 u_1 + B_n)^2 A_n \mu_0 u_1 + B_n$

$$\xi_n = \frac{A_n}{(A_n \mu_0 u_1 + B_n)} \quad \text{where } A_n = \frac{\frac{a_n}{\mu_n} - \frac{a_{n-1}}{\mu_{n-1}}}{1 - \frac{1}{\mu_n \mu_{n-1}}} \quad \frac{a_n}{\mu_n} - \frac{a_{n-1}}{\mu_{n-1}}$$

$$U_n = \frac{\kappa_n}{\mu_n \mu_{n-1}} \quad A_n^{-1} = \frac{a_n}{\mu_n^2} - \frac{a_{n-1}}{\mu_{n-1}^2}, \text{ and so for } B_n B_n^{-1}$$

The value of ξ_n can also be put into a form which shows the nature of this quantity most plainly, thus:—If a ray normally incident on the n^{th} surface be traced backwards through the optical system, when it finally emerges it will cut the axis of the system at a distance $\frac{\xi_n}{u_1 \xi_n - 1}$ in front of the vertex of the first surface. If the object be distant (as is usually the case) this distance is $-\xi_n$, and hence under these circumstances $+\xi_n$ is the apparent distance of the centre of the n^{th} surface behind the vertex of the first surface.

The five Petzval equations involve some interesting points. The two conditions for spherical aberration and coma are

$$\Sigma L_n = o \text{ and } \Sigma L_n \xi_n = o.$$

This is the same as the condition for the equilibrium of a system of parallel forces, $L_1 - L_n$, acting at the $\xi_1 - \xi_n$, which, are, as we have said, the apparent positions of the centres of the several refracting surfaces.

Now, a system of two parallel forces cannot be in equilibrium unless (1) the two forces act at the same point, or (2) each force is zero.

Consequently it follows that an optical system composed of two refracting surfaces, i.e., a single lens either thick or thin, cannot be free from spherical aberration and coma unless

1. The two surfaces are concentric.

2. There is no spherical aberration at either surface.

In neither of these ways is it possible to construct a lens having a positive real focal length.

Hence the first two Petzval conditions cannot be satisfied by any optical system having less than three refracting surfaces.

Next consider a system of three parallel forces in equilibrium. In this case we know that the two exterior forces must act in the same direction, and the third opposite force must divide the distance between them in the inverse proportion of the two first forces.

Hence in an optical system of three surfaces (i.e., two lenses cemented together) the apparent centres of the two surfaces giving spherical aberration of the same sign, must lie on either side of the apparent centre of the surface giving the opposite spherical aberration, and the latter centre must divide the distance between the first two centres inversely in the proportion of the first two spherical aberrations.

The object-glass of a telescope is an example of such an optical system. This is almost invariably composed of a nearly equi-convex crown lens cemented to a nearly plano-concave flint lens as in fig. 4.

Here the apparent centre of the first surface is O, the actual centre, since there is no previous refraction to take into account. On account of the refraction at the first surface the apparent centre of the second surface O_2 is rather nearer to the lens than the actual position, and, since the third surface is nearly plane, the apparent position of its centre is at O_3 the focal length of the lens in front of the lens.

In such a lens the first and third surfaces both give positive spherical aberration, as we have indicated is necessary, and then, if coma has been successfully eliminated, the centre O_2 must divide the distance $O_1 O_3$ in the ratio of $L_3 : L_1$.

It will be noticed that this argument is entirely independent of the thickness of the component lenses.

We can now show that such a system cannot possibly be free from astigmatism; for, if we put a small stop at O_2 , the astigmatism of the emergent pencil is

$$L_3 O_2 O_3^2 + L_1 O_2 O_1^2$$

and, since $L_1 L_3$ necessarily have the same sign, this cannot be made to vanish.

In fact in this case the astigmatism is the same wherever the small stop be placed, e.g., let the stop be placed at a distance $x (= O_3 K)$ in front of O_3 .

Since $O_2 O_3 : O_2 O_1$ as $L_1 : L_3$ we may put $O_2 O_3 = \lambda L_1$. $O_2 O_1 = \lambda L_3$. Also $L_2 = -(L_1 + L_3)$ where λ is some constant.

Then the astigmatism of pencil through K after refraction is

$$\begin{aligned} & L_3 O_3 K^2 - (L_1 + L_2) O_2 K^2 + L_1 O_1 K^2 \\ & = L_3 x^2 - (L_1 + L_3)(x + \lambda L_1)^2 + L_1 [x + \lambda(L_1 + L_3)]^2 \\ & = \lambda^2 L_1 L_3 (L_1 + L_3) \text{ and is therefore independent of } x. \end{aligned}$$

To be quite accurate, this astigmatism can only vanish if one of the three quantities L_1 , L_2 , L_3 vanishes and the apparent centres of the other two coincide, and the spherical aberrations of the two latter surfaces are equal and opposite. Such an optical system, however, cannot possibly give a real focus.

We, therefore, conclude that to satisfy the first three Petzval conditions at least four refracting surfaces are necessary. This is a point of some interest. An optical system of four surfaces provides

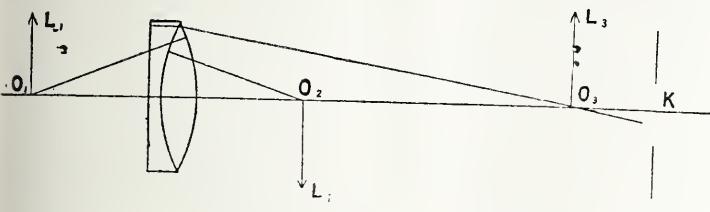


FIG. 4.

us with seven variables, viz., three thicknesses and four curvatures, and yet three of the necessary conditions cannot be satisfied with fewer variables.

In an optical system containing four refracting surfaces free from spherical aberration, coma and astigmatism

$$\begin{aligned} L_1 + L_2 + L_3 + L_4 &= 0 \\ L_1 \xi_1 + L_2 \xi_2 + L_3 \xi_3 + L_4 \xi_4 &= 0 \\ L_1 \xi_1^2 + L_2 \xi_2^2 + L_3 \xi_3^2 + L_4 \xi_4^2 &= 0 \\ L_1 \xi_1^3 + L_2 \xi_2^3 + L_3 \xi_3^3 + L_4 \xi_4^3 &= 0 \end{aligned}$$

Hence

$$\begin{aligned} &= L_1(\xi_1 - \xi_2)(\xi_1 - \xi_3)(\xi_1 - \xi_4) \\ &= L_2(\xi_2 - \xi_1)(\xi_2 - \xi_3)(\xi_2 - \xi_4) \\ &= L_3(\xi_3 - \xi_1)(\xi_3 - \xi_2)(\xi_3 - \xi_4) \\ &= L_4(\xi_4 - \xi_1)(\xi_4 - \xi_2)(\xi_4 - \xi_3) \end{aligned}$$

Hence if $O_1 O_2 O_3 O_4$ be the apparent positions of the centres of the surfaces in the order in which they occur and $O_1 O_2 = x$ $O_2 O_3 = y$ $O_3 O_4 = z$ we have

$$\frac{L_1}{yz(y+z)} = \frac{-L_2}{(x+y+z)(x+y)z} = \frac{L_3}{(x+y+z)(y+z)x} = \frac{-L_4}{xy(x+y)}$$

Hence we see that the spherical aberrations of the surfaces corresponding to $O_1 O_2 O_3 O_4$ must be alternatively positive and negative, and in the ratios given by this equation. In other words, each spherical aberration is proportional to the product of distances between the three other apparent centres.

Considering next the distortion of such a system. This is—

$$\begin{aligned} & L_1 \xi_1^3 + L_2 \xi_2^3 + L_3 \xi_3^3 + L_4 \xi_4^3 \\ & + U_1 \xi_1 + U_2 \xi_2 + U_3 \xi_3 + U_4 \xi_4 \end{aligned}$$

Since the distortion consists of these two series $\Sigma L \xi^3$ and $\Sigma U \xi$, it follows that the distortion can, theoretically, be eliminated. Thus all the five Petzval conditions can theoretically be satisfied by a system composed of four refracting surfaces.

We can now consider some practical aspects of the question: How far photographic lenses can be improved upon in the future? The chief directions in which it would seem that progress is possible are increased simplicity of construction and greater usefulness.

With regard to simplicity of construction, it would appear that we are still far from the theoretical limits, since it appears that it is possible to construct a perfect lens having only four refracting surfaces, e.g., a system composed of only two thick lenses, while it is quite possible that this limit will never be reached unless in the future glass-makers succeed in producing glasses of altogether abnormal qualities; still, even systems with five refracting surfaces

(e.g., a cemented lens and a single lens) would be a considerable improvement on anything at present produced; and there is no doubt that, if it can be done, it will be done sooner or later.

With respect to the question of increased usefulness, the subject of combination lenses naturally occurs. As we have already shown, if each of the single combinations of a double lens is to be corrected for spherical aberration, coma, and astigmatism, each combination cannot have less than four refracting surfaces, e.g., either three lenses cemented together, or two lenses separated by an air space.

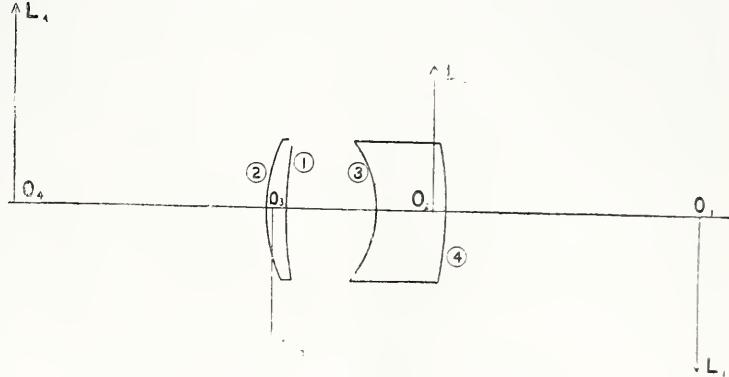


FIG. 5.

Thus the minimum number of refracting surfaces in such a doublet lens is eight, and consequently it cannot possibly be made very simple in construction.

In the only doublet lens of this nature at present manufactured—the Zeiss-Satz Anastigmat—there are altogether five refracting surfaces in each lens, so that it appears that an improvement in the direction of simplicity is still possible in the case of such lenses. In fact, there seems to be no reason why lenses like the Goerz and the Voigtländer Collinear should not be perfected for each single lens, which is not the case as they are at present manufactured.

H. L. ALDIS, B.A. (Cantab.)

AMERICAN PHOTOGRAPHY.

[Reprinted from Wilson's Photographic Magazine for July,]

SOMETIMES patience ceases to be a virtue, and must give place to the whip of plain speaking. It has become the fashion of late, more particularly with a noisy section of the English photographic press and a few ambitious youngsters on this side of the Atlantic, to decry all American photography, save that produced by a certain "school," as something almost beneath contempt. In season and out of season we are confronted with windy critiques, from which we learn that, with the exception mentioned, photography in America is in a truly deplorable condition. According to these amusingly ponderous utterances, which abound with verdant freshness and advice of a very lofty kind, our amateur photography is childish and crude in the extreme; our professional portraiture hopelessly bad and beyond redemption; our photographic journals are blind leaders of the blind, given to "hifalutin," and generally despicable. Difficult, indeed, would it be to say in what the fashionable critic of to-day differs from the Pharisee of old!

At first the output of these self-anointed critics was regarded as adding to the gaiety of nations as so much "light reading," to be smiled over rather than seriously considered. The superior "tone" and mystic subtleties of Hartmann's papers, for instance, tickled the sense of humour in the American reader. The long drawn condescension and soulful earnestness of Hinton's contributions, as another instance, provoked that delightful bewilderment which the American enjoys when puzzling out a genuine British joke as we find it in *Punch*. The sugar-coated pills of pure art, given out quarterly in a certain club organ, so "doped" the subscribers thereof that back numbers of the papers sold at a premium, and the price was doubled that the pills might be made stronger. The reverberations of Keiley's "pom-pom" brought forth a salon even out of Chicago, made *The Photo-American* shriek in sarcastic comedy, and awoke the gentle Cummings from his peaceful slumbers under the shadow of Plymouth Rock. All of which is duly attested in various precious documents, organs, and what-not published here and abroad. But the fashion has been overdone, and latterly its narrowness

of view, its self-assurance, and fatal lack of common sense have given it a nauseous flavour, and it deserves condemnation as a public nuisance. On another page, therefore, we give place to a well-informed contributor who takes a few of the "godlings" to task for their bumptiousness. His treatment of them, although severe, is well merited by the absurdities they have perpetrated in the fair name of criticism.

As for American photography, it needs neither apology nor justification at our hands. It is appreciated at home by a public quite intelligent as that to which the European photographer appeals. Whenever exhibited abroad, as at London, Paris, Berlin, Vienna, &c., it has secured more than a proportionate share of praise and reward. In common with the photography of England and other countries, it has its weak points as well as its points of excellence. But, if we compare it at its best, or by its average, with the best of average foreign work, the fact is plainly evident that the American photographer, amateur or professional, has no cause to be ashamed. And this may be said, with equal truth, of his achievements in the past as well as of his promise for to-morrow.

[The relevant portions of the exceedingly able article to which our contemporary refers are appended. We congratulate the author, Mr. Ward, on his temperate treatment of some regrettable phases of American and British photography. With regard to his analysis of the second half of his subject, he may be assured that his remarks will find widespread if not universal acceptance in this country.—EDS. B.J.P.]

THE CULT OF THE GODLINGS.

MANY interesting discussions have recently taken place concerning the relative merits of what are spoken of as the "old" and the "new" schools of photography. The question has almost, for the moment, overshadowed that somewhat threadbare one, "the professional *versus* the amateur." It may, in turn, yield precedence, for a little while, to the Cult of the Godlings. It certainly will not fail to do so through any neglect of effort on the part of the godlings themselves.

Within the past few years several persons possessed of artistic temperament, and with the technical training of artists, have chosen photography as a means of expression. They have not, usually, depended upon the camera for a livelihood; and they have not graduated through the studio of the professional photographer. Freedom from the conventions of orthodoxy, and from the whims and wishes of "the sitter," has enabled these workers to develop along new lines. The result has been the moulding of a number of useful individualities; and the accession of a number of these workers—including several women—to the professional ranks may exercise a broadening influence on the craft as a whole.

Within the past few years, too, the amateur has increased in the land, and among the many there are many good workers. They wisely keep aloof from portraiture as commonly understood, and work along lines of their own. There are many who do good work, a few who do very good work, and the fact has not been overlooked by the American in general, in whom a generous appreciation is a characteristic trait. Perhaps it is this appreciation, given with a simple wish to please, which has led to the formation of a select "inner circle," a circle which claims, in effect, that it contains within itself all that is commendable in American photography.

As with all cults, these godlings have their advertisers, and these are, curiously enough, led by an Englishman. The godlings who are most closely associated with the publicity department of their cult, and of themselves—mostly of themselves—are, in England, A. Horsley Hinton, and, in America, Joseph T. Keiley, and a person named Hartmann.

There is in New York a body of men styling themselves the Camera Club, and within this body the godlings reign. In a measure, aloof alike from their brethren and the outlander, the godlings have undertaken the regeneration of the country and the exploiting of themselves.

Neither the country nor their fellow club-members are exactly clamorous for regeneration, but this does not check the good work. To assure themselves of a constituency, the godlings have annexed several of the strong workers referred to as having recently entered the ranks of photography. These workers have not been consulted as to their adoption; it is a case of "benevolent assimilation."

The person Hartmann teaches through a series of dissections of the work of the adopted ones, with portrait of the author. To judge from his writings, he has no acquaintance with the practical side of photography, as he certainly has none with either its breadth or its history. He is said to be a very able "art critic," and true it is that at first glance his writings would, if it were possible, deceive the very unselect. With a wide range of adjectives and much disregard to punctuation (points in which he hopelessly outdistances even so careless a journalist as myself), he

fashions sentences which the reader is apt to accept on sight. A more careful reading reveals that his mission is dissection, sometimes critical, sometimes cold-blooded, and that, when he does not dissect, he is commonplace.

I may here point out that the godlings suffer from an inability to discriminate between the temperament of the artist and the eccentricity of the crank. They have, too, an erroneous conception of the requirements of the critic.

The critic must be a man of wide sympathies and wider knowledge; not the narrow mouthpiece of a cult.

It may be urged that I am speaking almost too strongly for journalistic courtesy, but those who have read the somewhat arrogant writings of the cult will recognise that I am but following them a little distance on their road. Hartmann is scarcely worth more serious consideration, and we will turn to Messrs. Horsley Hinton and Joseph T. Keiley. Horsley Hinton is a maker of good pictorial photographs; so good is his work that it is difficult to associate Hinton the photographer with Hinton the godling writer. He has, at times, shown himself to be a worthy successor to H. P. Robinson at his best, which is high praise for a photographer. Keiley has a graceful and facile pen, and, with matured powers and a broader grasp of his subject, he might in part fill the place left vacant by Gleeson White. It is always a delicate task (for any one but a self-constituted critic) to judge work which the author announces as intended for "the few." Keiley might be termed an interesting and clever experimenter, and his work at times suggests a transition stage which should be cultivated in retirement. Hinton and Keiley might together make a team. If the former would abandon his pen for all time, and the latter go slowly with pen and camera until assured of his pictorial standing, the photographic world might be helped.

There is a period in the life of every well-regulated boy when he first experiences the delight of long trousers and anticipations of a moustache. At such a stage of existence sisters are an unfortunate possession, and the old schoolhouse is suddenly discovered to be the resort of undersized and altogether despicable juveniles. This attitude of youthful superiority is the one taken by the godlings.

A correct estimate of Keiley's writings may be obtained from the pages of *Camera Notes*, and from his contribution, "The American School," to *Photograms of the Year 1899*. In this latter effort we learn the position of the elect.

Since the beginning there have been good workers—respectable practitioners they might be termed—in the ranks of photography. One by one, school by school, they have budded, and blossomed, and faded. Their influence has been *nil*, and their names are forgotten, because they lacked utterance. The result has been stagnation of all things until the godlings arose, and with a great shout sent a thrill of life throughout the land.

Their principal means of publicity is *Camera Notes*, a sumptuous and expensively illustrated quarterly magazine, described by Keiley as "the most unique photographic magazine in the world." Among the many modest achievements of this "most unique" quarterly, it "has raised the standard of photographic excellence in both amateur and professional circles far above any previously established; has educated the public taste to an understanding of what really good work is, and has created an art movement in the photographic world that gives every indication of maturing into a distinctly American school." The magazine "is so much in demand, that almost immediately it appears the copies sell at a most extraordinary premium, and the most advanced of the leaders of the new movement have come to be termed disciples of *Camera Notes*."

These quotations are from the pen of Mr. Keiley, and he announces further an issue of some of the illustrations of *Camera Notes* in separate form: "A portfolio containing eighteen exquisite photogravure reproductions of the masterpieces of some of America's foremost workers. This portfolio is the most perfect thing of its kind ever published."

Of course, all this glorious achievement has not been without cost.

"There is opposition, bitter, aggressive opposition. . . . But slowly, irresistibly, almost imperceptibly, the forces of ignorance, provincialism, and prejudice have been crushed to the dust, and no longer bar the advance of progress."

An examination of the pages of *Camera Notes* shows it to be under the editorial control of Alfred Stieglitz, with Joseph T. Keiley as assistant-in-chief. The inference, therefore, is that the "most advanced workers of the new school" are disciples of Stieglitz and Keiley. This inference is confirmed by the fact that *Camera Notes* is largely used for the personal glorification of these two gentlemen. This glorification is carried to absurd lengths, for, when either of these writers enters into eulogy of

the cult, a note signed by "The Editors" is appended, pointing out that only the modesty of the writer has excluded his own name from share in the adulation. Thus does modesty meet its reward in receiving the greater glory. I did not include Mr. Steiglitz among the godlings. He is saved this distinction by the undoubted excellence of his photographic work. Every one who knows his versatility, his strength, and his sound technique, regrets that so able a worker should have fallen under godling influences; and this regret is greater with those personally acquainted with his real courteous modesty, so much at variance with the phase which he permits to be revealed in print.

Not content with leading the American photographer from darkness to light, the godlings have further endowed him with a new method of faking which will revolutionise all things. This new power, which is commonly spoken of as "the glycerine method," marks an epoch in photography greater than its first discovery, and infinitely greater than the entry of such innovations as the dry plate or platinum paper. The glycerine method is, in its outline, simplicity itself, and of a robust age. A platinotype is printed, and before development it is coated with glycerine. The developer is applied locally, usually by means of a brush, and this method allows of much local control, amounting to entire blocking out if required. The process may be carried a step further, and different parts of the same print developed with different developers. This gives possibilities of various tones, and is used mostly to impart a "flesh tint" in places, a thing that was not possible hitherto except by use of paint (and a wash of water colour on a photograph is altogether illegitimate and not to be mentioned in godling circles).

Perhaps the godlings are wise in endeavouring to lastingly link their names with the perpetual fame of the glycerine method. Cannot they read the lessons of the past? Who first applied the practice of vignetting to photography? No one surely knows, and yet some one was the first to see, with the sure eye of genius, that simple method by which countless thousands of photographs have been rendered "artistic." In future years, when comparative merits can be more accurately gauged, the beginnings of photography may be traced to the closing years of the nineteenth century, and statues raised to those who so thoughtfully placed themselves on record as the true and only godlings.

A Horsley Hinton has several times contributed godling utterances to American journalism, and he has recently hashed his teachings into a contribution to the catalogue just issued by Andrew J. Lloyd & Co., of Boston. Writing on "The Renaissance of Artistic Photography in America," Hinton is not content to be a godling, but aspires to the position of a little god. Those who are interested cannot do better than obtain this catalogue and read the article. I think that none who do so will consider me unduly discourteous in my somewhat frank consideration of an artist and an editor.

Hinton is, as I will show, somewhat inapt as a writer, but a careful reading of him will reveal what he is endeavouring to say.

We all know, to our sorrow, that we are apt to get too much on our plates. But not one of us, even in his insanest or most artistic moments, ever imagined the thing to be as bad as it is painted by A. Horsley Hinton. Hear the declaration of the godling:—

"Photography's deficiencies or shortcomings, artistically, consist of excesses; that is to say, its promiscuous inclusiveness at once makes it deficient in power of making selection and redundant in execution, or, to put it otherwise, the compulsory excessive inclusion makes necessarily a lack of power to omit."

In *'The Pose in Portraiture'* John A. Tennant tells us the same thing:—

"The bane of photography as a method of expression is that it tells too much, and gives equal prominence to things important and unimportant."

Mr. Hinton should take a lesson in expression from his "American contemporary."

Hinton considers it an axiom that the applications of photography to the attaining of scientific knowledge or for the giving of aesthetic pleasure "are higher and nobler than the more practical and useful applications to commerce and the useful arts, or even to its cultivation as an independent handicraft." We learn that photography has suffered from inartistic sponsors: "Were not the chemist, the optician, the skilled artisan, so to speak, the godfathers of the infant photography? And these trained up the child as they supposed it should go." This unfortunate fostering led to a striving after fidelity to truth; the photographer erroneously supposed that his artist's mission was "to copy nature," and gauged his success by his closeness to the fact. After learning this through many paragraphs, we reach the "art." And here we come to an understandable explanation:—

"The difference between the photograph and the picture is that the

former indiscriminately records everything, without selection or preference, as a final fact; the latter selects some out of the many, and emphasises one or few out of these, in order to express an idea or sentiment and appeal to the imagination of the beholder."

As a half truth this may be accepted as a truism. Pronounced as an axiom, with its evident inference, it is unworthy of further consideration.

Mr. Hinton refers, more in sorrow than in anger, to the fierce opposition which the godlings have incurred. Unlike those martyrs of old, who went to the stake in defence of their faith or in opposition to the faith of their enemies, the godlings have been forced to a compromise. This is perhaps to be regretted, but certain it is that the word "artistic" has been sacrificed on the altar of expediency, and "pictorial" reigns in its stead. A somewhat complex and unconvincing argument is advanced to defend and define the limits of faking, and we learn that its practice is a temptation to "exceed the limits of good sense and good taste." This is interesting, and we learn further that the means are only justified by the excellence of the result. "The notoriety which awaits on mere eccentricity is the applause which is indulgently given to the fool." Chance effects are, we are told, "the antics of a clown or the jangle or cap and bells, and the praises awarded to each one are of equal value."

From these comforting hints at godling worshippers Mr. Hinton rises to the peroration.

In three paragraphs the career of American photography is painted with much godling content.

"It has been long enough with us to acquire bad habits, like a young child; and, having progressed in the wrong way, the task of correction is proving a difficult one to those who, seeing the evil and being moved with regret at the prospect of lost possibilities, and stimulated by the passion of the reformer, are, by example and precept, seeking to arrest those tendencies which prevent it attaining a nobler state."

"In America, as in England, photography's exceeding adaptability to every-day uses has, perhaps, led to its undue exaltation as an industrial craft; and the craftsmen, made vain by the praise of the undiscriminating, are content with the smug complacency of moderate success in little things. They have not the spirit to see that a position, if only on the steps of the higher throne, is greater glory than a seat amidst the crowd."

"Artistic or pictorial photography in America is but of a very tender age, and in no country are the possibilities of its future greater. None the less, it may very easily become crippled or deformed, led astray, or crushed out of existence, but that its guardians, if few, are sufficiently staunch and loyal to make the last contingency very improbable."

Good little godling!

Mr. Hinton falls foul of the professional worker, of the amateur, and of the journalist. He may himself be classed among the two latter, and as he once, for a brief period, entered the ranks of the former, it might reasonably be inferred that he had some little acquaintance with his subject. Here is his word on the professional:—

"The men by whom photography is practised are chiefly those who pursue it with purely selfish ambition, and are interested in its advancement only in proportion to the increased aggrandisement such advance may lead to. In thousands of cases we find men who have adopted photography as a profession, not from any special aptitude for it, nor from love of it, but because the mere chance of circumstances did not lead them to be shoemakers or to follow some other trade. Succeeding more through the excellence of apparatus and perfection of process than their own skill to produce likenesses of men and things, they, knowing no better, call themselves artists, adopt a sham Bohemianism of carriage, and by careful observation cultivate an unconventional exterior, which is as artificial to them as it is an essential attribute of a genuinely artistic temperament."

Now, should even a godling be allowed to utter such nonsense without protest? Wrapped in his own superiority—smug complacency he terms it—he speaks on a subject of which he knows but little and understands even less. His broad contempt makes legitimate almost any mode of reply. Certain it is that a pestle-and-mortar treatment would prove ineffective, and the choice lies between the bludgeon and the rapier.

To leave the professional, we will turn to the amateur:—

"The debasement of photography, due to its being practised by thousands of people as a mere frivolous pastime, has been brought about by the ingenuous commercial enterprise."

Good little godling! We will let the amateur wriggle in company with the ingenuous commercial enterprise, and pass on to the journalist:—

"The reproductions of contemporary work, which are spread worldwide by the enterprising publishers of American photographic journals and magazines, are for the most part such as to make one marvel who is

responsible for their publication, and what manner of men they may be.

"My American friends who are ably and devotedly labouring for the advancement of better things in photography must not be surprised if England and Europe are slow to give America credit for as much as, through them, she deserves, when for every single one of their own clever reproductions that ever reaches more than a few favoured ones, ten thousand reproductions of the most paltry rubbish are showered around, accompanied by highfalutin eulogiums from the editorial pen.

"The illustrated photographic publications of America are, with the rarest exceptions, the most serious drag and hindrance to pictorial advance."

Now, Mr. Hinton, what do you deserve?

You are a clever and widely known photographer, and you are a godling. I am neither. But we are both journalists, and on this basis we will talk.

I will commence with a little anecdote. A few years ago, when I was in England, an American lady married a somewhat uncivilised Indian, and we all twitched our noses into promise of a sneer and said "American." Recently an English gentlewoman married an African "king," no remove from savagery. It was the culmination of what had become more or less a scandal. But the American people said "foolish girls." Can you apply the moral?

Mr. Hinton wonders, with true godling insolence, what manner of men publishers of American photographic journals may be. He says, with more than godling impertinence, the American journalists reproduce the most paltry rubbish, accompanied by highfalutin eulogiums.

The present writer has selected many photographs for reproduction, and he has written concerning some of these photographs. He has never selected paltry rubbish, and he has never written highfalutin eulogiums. Hinton is editor of a photographic journal. He has published half-tones which have made courteous American journalists say among themselves that probably the block did not do justice to the original. He writes highfalutin eulogiums, and he writes most paltry rubbish.

Mr. Hinton wonders what manner of men we may be. He will be interested to know that many—probably the greater number—of the "American" editors known to him are British-born or English subjects.

The average American photographic editor (British included) is a hard-working, conscientious journalist. He possesses some knowledge and some sense; he has a brotherly feeling for his co-workers, and he minds his own business. I have said that Mr. Hinton's remarks are not true as regards myself. I will go further. I have the honour of knowing the editors of all the recognised photographic magazines published in New York, including Dr. Wilson, who has been an editor for a third of a century; and Dr. John Nicol, who practised photography before Mr. Hinton was born. Add to these that unregenerate man, F. Dundas Todd, in Chicago, and several others who are doing honest work. Mr. Hinton's remarks are not at present true concerning any one of them.

It has grown to be a custom for some English journalists to sneer at American magazines. They will quote from or refer to "an American contemporary." When they find something which is not in the best of taste, they have not the grace to keep silent. They do not even name the culprit; they name "American photographic magazines."

A. Horsley Hinton is a man who has produced good photographic work. As a photographer he has earned an honourable position among the leaders in the art. Nowhere has this position been more generously accorded than in America. In treating of Hinton the photographer we are treating of a strong worker.

Hinton the writer is a man who produces much specious nonsense. Where he is not ponderously involving his sentences around some trite commonplace, he is moralising with smug godling complacency, or indulging in ignorant tirades. It may be that his defects have never been hinted to him, and that until now there has been no awakening. But I fear the trouble is too deep for treatment even with the knife; and I can only hope, with all who know his work, that he will either learn facts and restraint, or for ever hold his peace.

WILLIAM EDWARD WARD.

CONVENTION MEMORIES.

The Convention is one of those institutions that take firm hold on any one who has participated in one of these functions. The writer has enjoyed these summer outings; he has even, incredible though it may seem to some, learned something therat; but this year the fates were unpropitious and he was perforce absent.

During the week of the Convention the knights of the camera were much in his mind, and from past memories he enjoyed a—vision, shall we call it?—of the delights of the Conventioners.

Newcastle is a manufacturing town, consequently the hospitality is kindlier and the welcome warmer than in the abodes of gentility, where industry dwells not. The picture that first rises before the mental gaze is President Bedding—who might almost be taken as the press representative of photography—attended by his satellites, receiving the homage of the great I AMs of Newcastle. His honours sit lightly on the President, but he infuses a sublime dignity into the character that is in magnificent contrast to the humble adoration of the civic chief.

We cannot help thinking of the lovely old-world courtesy of that well-known Conventioner, Mr. Patterson Gibson. Probably he forgets his act of kindness to the writer when on his first Convention visit, but it's "minded" yet. With what inimitable charm he would act as the guide, philosopher, and friend at the Hexham excursion. In what picturesque language he would describe the various beauties and antiquities, with which he seemed to be on intimate terms of acquaintanceship. One of the beauties of the Convention is the ability of the guides selected by the Local Committee, and fortunate indeed it is that that their descriptions are always spiced with a *soupgon* of humour, unconscious it may be—probably the unconscious species is the better.

Of course, these various humours—*contretemps*, I believe, is the learned name for these said humours—are to be found in every P.C.U.K. One of these rises visibly before me. Photographing in a cathedral on one of the delightful excursions, there was one special view, a charming picture, although it had been degraded to the position of a stock photograph, that could only be taken at a certain time of the day, looking through a small window in a part of the ruins of the cathedral. As the proper moment approached, a number of us, intent on securing a negative of this famous picture, made our way to the said window. A lady was in possession, but that did not scare us; she would be finished in a minute. She was evidently of a "pernickety" disposition, and time and again she viewed the scene on the ground glass of a quarter-plate camera. The minutes were flying, but still the lady laboured on. Some of us gnashed our teeth with suppressed rage, while others, with less command over their tempers, used language that would certainly not be permitted in Parliament. Her ladyship heeded not. At last she made the necessary exposure, and on leaving said, with a seraphic smile—I am not sure if, looking at the weight of the subject, seraphic is quite the correct word, but I'm sure the lady will approve of it—"I hope I have not kept you waiting." There was a rush for that window, but the sun rendered all efforts of the patient ones futile. Only one Conventioner has a negative of that view, unless the wishes of some of the disappointed ones were fulfilled; in that case, no negative of that view was secured at the Convention.

After my experiences of the Convention, I have come to the conclusion that the Thornton-Pickard people are practical jokers of the deepest dye. The reason of this finding is their purveying of that "shutter" dark room. In the first place, it cannot be called an advertisement, as no "instantaneous" work has been done in that "shutter"; the work has been all "time," and a very long time at that. Look at the countless "cursory remarks" that have been made by the waiting multitudes while some fastidious photographer laboriously numbered each plate he had exposed, and as laboriously dusted each unexposed plate before placing it in the plate-holder. The time he occupies seems hours to the "exposed" workers outside, while they see many sure medal-winners, pictures that could not fail to please any judges, vanishing beyond their ken. It has been suggested that the new valve exposure be used and set at the longest time marked on the disc; when the time expired, the door would open, and, if the plates were not then changed, the man inside would have his trouble for his pains, and the attendant in charge would get as much education from the elocution of the inside man as he does now from the oratory of the outside photographers.

The writer has, as already stated, been, much against his will, absent from the Newcastle Convention, but those memories have kept alive the desire to be present, and he hopes to gratify his longings by being present at the Oxford show.

He hereby expresses his regret to the President and office-bearers for the chagrin his absence must have caused them.

ALLAN BLAIR.

A METHOD OF RECEIVING TELEGRAPH SIGNALS AS DISPLAYED OR PHOTOGRAPHED BY MAGNETICALLY DEFLECTED CATHODE RAYS.

[Siemens' Patent No. 16,444 of 1899.]

A STRIP of sensitised paper which is intended to receive the transmitted signals is moved by a motor, clockwork or similar appliance at a suitable speed. It is placed with the other necessary parts of the receiver in a dark room. The strip of paper is exposed to cathode rays, which are deflected from their normal position in a manner corresponding to the signals to be given by the received current flowing through a coil of wire (which may contain iron). These deflections can be used in different ways for producing telegraphic signals on the paper strip. When shorter

and longer signals are required, for instance dots and dashes as for the Morse code, current impulses of shorter and longer periods are sent through the deflecting coil, causing the cathode rays to remain deflected for shorter or longer times. These positions of the cathode rays are then fixed on the paper strip in the form of dots and dashes. An arrangement like this is shown in fig. 1 of the drawings accompanying our provisional specification, but with the modification that the cathode rays do not act directly on the sensitised paper, but indirectly through the light which they create on a fluorescent screen.

a represents a Wheatstone apparatus for automatic quick sending. The current flowing through this apparatus is sent through the line *l* to the receiver *b*, where it passes through an electro-magnet coil *m*. In front of this electro-magnet the cathode ray tube *c* is placed, which is excited in a

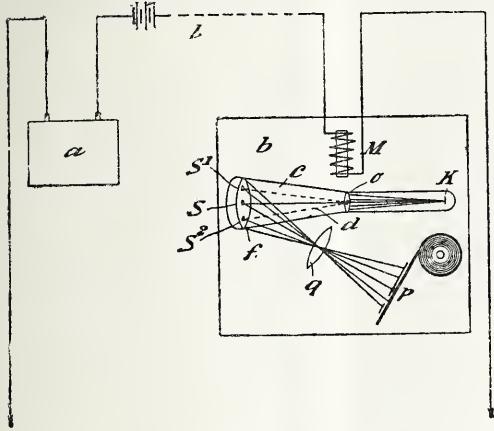


FIG. 1.

suitable manner. A bundle d of the rays emitted from the cathode K passes through the opening in the metal disc O and strikes the fluorescent screen, J , where it becomes visible in the form of a spot S . The rays d are deflected to the position S^1 or S^2 according to the direction of the current flowing through the electro-magnet M . In case the position S^1 corresponds with the telegraphic current, a lens q is so placed that the light rays, corresponding to this position, are projected against the paper strip p , where, according to their duration, they are fixed as dots and dashes; the light rays corresponding to the positions S and S^2 are screened off, and are therefore not photographed. It is to be understood that signals other than the Morse signals can be received in this way.

According to a modified method of using the deflected cathode rays, the deflection according to its magnitude is applied to indicate certain letters or other signs. The current impulses sent into the line by the transmitter have in this case generally the same duration. The different current

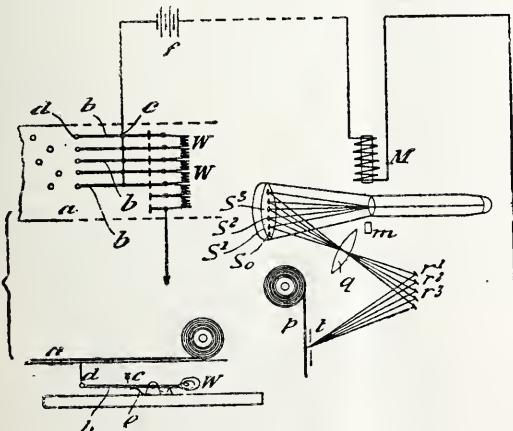


FIG. 2.

intensities which are to correspond to the different signals are either produced by the insertion of resistances into a circuit of a constant potential or by connecting the line during the sending of the current in such a manner that it is acted on by different electro-motive forces. These may be obtained by connecting the telegraph lines, according to the different signals, with different contacts of a row of contact blocks between which there are contacts for different electro-motive forces.

In the first instance the transmitter is of the known Wheatstone type for high-speed telegraphy, which works with a perforated strip of paper and in which each hole in the paper effects the closing of a certain circuit. It is of advantage to use with this an auxiliary contact, which is inserted into the circuit and which is worked by the transmitter itself in such a manner that the absolute closing and opening of the circuit is effected by the auxiliary contact after the contact which corresponds with the hole in the paper has been established, or before it is interrupted. In

this way all the sparking is in the known manner removed to the auxiliary contact, which can easily be exchanged.

An arrangement of this kind is shown diagrammatically in fig. 2 of the drawings accompanying our provisional specification. *a* is the previously perforated paper strip of the transmitter, which is moved over the contact levers *b*, *b*, *b*. Whenever a hole in the paper strip *a* appears over one of the pins *d* the pin is raised by the spring *e* and at *c* a contact is made. All the points *c* are connected with the pole of the battery *j*. Between the contact levers *b*, *b*, *b*, the adjusted resistances *w* are connected. The last of these resistances is connected to earth. Whenever one of these levers makes a contact, the circuit is closed through a definite fraction of the resistance and a current of a definite strength is produced, which causes a definite deflection of the cathode rays. The receiving apparatus shown in fig. 2 differs from that shown in fig. 1 by the following arrangement. The zero position of the cathode rays is, through the influence of the adjusting magnet *m*, situated on the lower part of the fluorescent screen on the place marked *s*, and is deflected by the electro-magnet *M* in steps to *s*¹, *s*², *s*³. Each of these deflections represents a different letter. The illuminated spots *s* are projected by a lens *q* and the mirrors *r*¹, *r*², *r*³, to a hole in the diaphragm *t* behind which the sensitised paper strip *p* is moved. On the face of the mirrors letters of opaque material are fixed, the images of which are then photographically fixed on the paper strip as instantaneous photographs, the time of each current impulse being very short. For projecting the different illuminated spots, *s*¹, *s*², *s*³, on to the same place where the letters &c. are to be photographed, other known means, for instance, prisms of a separate lens for each point may be used. Fluorescent letters may be fixed to the spots *s*¹ which would light up through the influence of the cathode rays and would be projected on the sensitised paper.

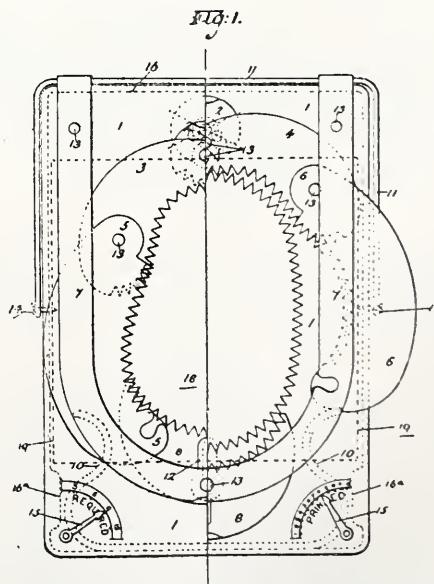
A third method for using the deflection of cathode rays for telegraphic purposes is as follows:—

If the cathode rays, instead of being acted on by a single electromagnet M , are acted on by two or more, which are fixed at an angle relatively to each other and which are influenced by different telegraphic currents, each of which at the transmitting station can be varied as regards strength and direction, combined magnetic fields are created, which produce deflections of the cathode rays in various directions. In this way it is possible to obtain a deflection of the cathode rays all round the zero position, and with each of these deflections (as described above) it is possible to project a certain letter on to the place where the moving sensitised paper strip is exposed.

MAURICE'S IMPROVEMENTS IN PRINTING FRAMES.

[Patent No. 1108 of 1900.]

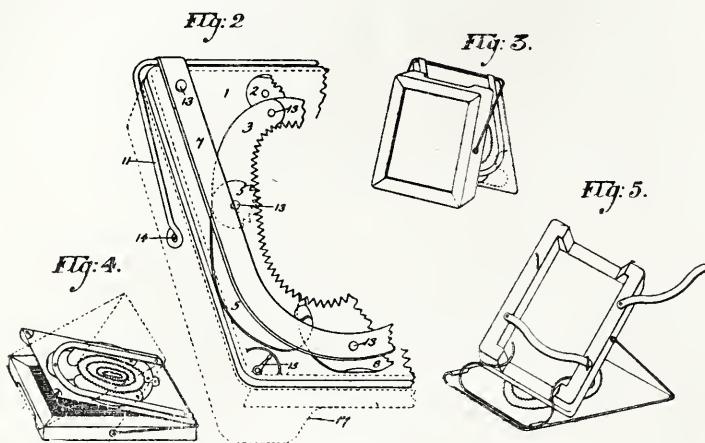
1 is a large plate covering printing frame, with full-size opening cut or stamped out either plain or serrated. The plate 1 may be strengthened and raised from the printing frame in any convenient means by the edges 16 of plate being turned and bent over a piece of wire, the wire



side forming back of vignetter, an extra piece of wire, movable to form strut for skyshade, and retouching desk is attached 10. Plate 2 is a round plate, top part bent to catch hold of and having a slot cut, at the bottom of slot is a hole punched to take the fastener of plates 3 and 4, the slot in plate 2 allows for raising and lowering of plates 3, 4, 5, 6, and throwing them out of centre, so that the vignetter can be centered over any part of negative. Plates 3, 4, 5, 6, are fastened together by three pins, eyelets, rivets or suitable fastener, and are attached to plate 2.

Plate 7 is a piece cut or stamped out U shape and lies over plates 1, 2, 3, 4, 5, 6, 8, and 12, the top end is bent over support 11, and fastened at back of plate 1. Plate 8 is the bottom plate with vertical movement having slot cut in, and bottom edge turned up to catch hold of, 15 printer's indicators cut or stamped on plate 1 bottom corners.

10 is bent wire support for use as skyshade and retouching desk, and when not in use it is sprung into side of plate 1 at part 16^a. 11 is



support for attaching to printing frame over which plate 1 revolves plate 12 is small strip to cover slot in plate 8.

13 are the fasteners for all movable plates, to plates 1 and 7. 14, screws for fastening support of vignetter to frame. 15, pointers for indicator. 16, turned edge of plate 1 over wire. 16^a, turned edge of plate to take support 10. 17, printing frame. 18, half drawing showing pear shape opening. 19, piece of tissue or waxed transparent paper for soft vignetting in strong light.

Our Editorial Table.

KACHIN.

Prepared and sold by Messrs. J. J. Griffin & Sons (Limited), 26, Sardinia-street, London, W.C.

We have received a sample of a new kind of kachin Messrs. Griffin are putting on the market. Wherein this differs in chemical composition from that which has met with so much favour during the past year or so we are unable to say. Upon trial, we find it possesses all the qualities of the older form, while it possesses other advantages in addition. For example, the carbonates can be used instead of the caustic alkalies, which are objected to by some. Here is the formula as given for plates and films:—

Kachin Sodium Carbonate.

A.

	British System.	Metric System.
Kachin (avoirdupois).....	160 grains.	9 grammes.
Sodium sulphite (crystallised)	2½ ounces,	62.5 "
Water (up to) .....(fluid)	20 "	500 c. c.

B.

Sodium carbonate (crystallised)	2 ounces.	50 grammes.
Water (up to) .....(fluid)	20 "	500 c. c.

For use, take equal parts of A and B. More diluted developers give softer results.

With this formula development is complete in about four or five minutes, and the negatives are quite free from stain or tint in the shadows. A corresponding formula to this is given for those who prefer to work with ten per cent. solutions. Another advantage claimed for the new kachin, which we find is fully sustained, is that it can be employed for bromide papers, with which it yields excellent warm blacks. In this case potassium carbonate is used in place of the sodium salt. The new kachin is also used with advantage for Velox papers for colours. When restrained with bromide of potassium, it yields all colours, from a dark sepia to a bright red chalk, according to the exposure and the quantity of restrainer added. The new kachin, like the old, can be employed in the simultaneous developing and fixing

method by those who prefer that system. The formula for that stands thus:—

	Stock Solution.	British System.	Metric System.
Sodium sulphite (crystallised).....(avoirdupois)	4 ounces.	30 grammes.	
Caustic potash (purified, in sticks)	408 grains.	7 "	
Kachin	408 "	7 "	"
Water, up to .....(fluid)	10 ounces. up to 75 c. c.		

For fully exposed plates, take—

Stock solution	6 fluid drachms.
Hypo solution (1 ounce hypo to 5 ounces water)	10 "
Water	15 "

As a restrainer for kachin in the case of over-exposure, the makers recommend a five per cent. solution of ordinary borax, five to ten drops to the ounce of developer in place of the usual bromide. With the sample of kachin Messrs. Griffin & Co. were good enough to send us a box of kachin "cartols." These are glass tubes containing the kachin and accelerator, with a glass septum between them to keep them separate. The contents of each cartol have only to be dissolved in four ounces of water, and the developer is ready for use. Each box also contains a neat little corkscrew to remove the corks. These cartols will be found very convenient to amateurs, and the price is two shillings per box of six. Another great advantage of kachin as a developer is that it does not stain the fingers, and the solution can be used over and over again even after the lapse of a week or two, though, when much used or after long keeping, it requires, of course, a little longer time for its action. We should recommend our readers to write for the pamphlet on *Kachin and How to Use It*.

Modern Printing Processes is the title of a little book by Mr. H. G. Abbott, that has been published by Messrs. George K. Hazlett & Co., 373, Dearborn-street, Chicago, U.S.A. It deals with gum bichromate and platinotype, and especially with the glycerine and mercury bichloride modification of the latter process, of which such an absurd amount of fuss has lately been made in the United States by one or two amateur photographers. These gentlemen may be interested in knowing that local development of platinotype prints was first demonstrated in this country several years ago. However, the book before us is a useful little compilation, with several explanatory half-tone illustrations. It sells in paper covers for 25 cents a copy.

A CONVENTION GROUP.

SURELY not one of the party of sixty or seventy ladies and gentlemen who had the privilege of visiting Haughton Castle on the occasion of the Newcastle Convention will forget the pleasant hour spent one afternoon at that beautiful seat of Mr. W. D. Cruddas, M.P.? In the short space of time at command a considerable amount of photography was attempted, and several groups of the entire party were taken; amongst others, by Mr. R. W. Dugdale, who kindly sends us prints from each of his negatives. Photographers in groups are notoriously difficult to photograph successfully, and we must therefore congratulate Mr. Dugdale on the excellence of his results. They are pleasing mementoes of a pleasant time. Mr. Dugdale, whose address is Harold Villa, Kingsholm, Gloucester, asks us to state that he will be pleased to supply, free of cost, a copy to any one interested in the group, provided a stamped and directed cabinet-size envelope be sent him. For his generosity in this matter Mr. Dugdale is deserving of the greatest thanks.

THE PHOENIX REFLECTOR HAND CAMERA.

Manufactured and sold by McKellen (Limited), 165, Long Millgate, Manchester.

THE new reflector hand camera of Messrs. McKellen relies upon simplicity of essential movement in making an exposure. As the makers phrase it, "The movement which sets the shutter also removes the exposed placed plate, and brings another into position." Let the reader imagine himself, Phoenix camera in hand and about to take a photograph. By following this brief description, he will be enabled to realise how easily the Phoenix is manipulated: A ground-glass focussing screen, the full size of the plate, is placed in the top of the camera. A mirror is hinged at the angle formed by the planes of the sensitive plate and this ground glass, and, to manipulate it ready for exposing a plate, the cord, with tassel attached, which hangs underneath the camera on the left-hand side, must be drawn down as far as it will go, or until a click is heard. When this movement has been completed, and the aperture in front of the lens is opened, the light, passing through the lens, falls upon the mirror, and is reflected up to the ground-glass focussing screen, where the image can be seen its full size and right-side up. That the image may be seen distinctly, light is shaded from

This focussing screen by a hood, which folds down when not in use as a shade, and protects the ground glass from breakage. The focussing is adjusted by a metal pointer sunk into the right-hand side of the camera near the front. At certain positions in the path moved over by the pointer there are numbers, each of which represents the distance, in yards, of objects which will be in focus when the pointer is set opposite any particular number. The exposure is made by pressing a button on the front of the camera on the left-hand side. This releases the mirror, which, revolving on its hinges, rises to the top of the camera, allows the light from the lens to pass to the plate, and then closes the shutter behind the lens, thus completing the exposure. This is the essentially novel feature of the Phoenix hand camera, which was recently placed before us for our inspection and examination, and we congratulate the makers on a very clever modification of the reflector principle. The remaining details of the Phoenix constitute it an exceedingly useful type of magazine hand camera.

MERCK'S ACID PYRO IN HEAVY CRYSTALS.

E. Merck, 16 Jewry-street, E.C.

A SAMPLE of this concentrated form of pyro has been sent us. Besides possessing the convenience of diminished bulk, it also has all the good educating qualities of the older form of the product. Mr. Merck writes : "Although, as a rule, I supply my pyro in the light resublimed form, which has been in use for a great many years, I am prepared to supply these heavy crystals, but customers who wish to receive the latter kind ought to say so specially."

THE CHALLENGE CAMERAS.

Manufactured and sold by J. Lizar, 101 & 107 Buchanan-street, Glasgow.

A LARGE selection from the well-known and justly appreciated series of hand and stand cameras bearing the name of Lizar was recently placed before us, and we have much pleasure in making mention of the season's modifications and improvements in those instruments, with which the

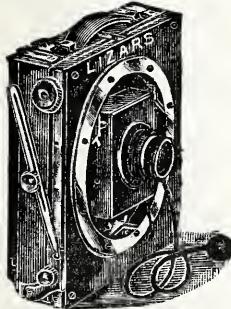


FIG. 1.

photographic world is so familiar that a detailed description of each camera is rendered unnecessary. Taking them in order of reference, the new Challenge stand camera, which forms an item of the seventy-shilling set is now fitted with a time and instantaneous shutter with special indicator (fig. 1). The Challenge combination stand camera (figs. 2 and 3) is well named, for its uses range from very short focus work to copying.

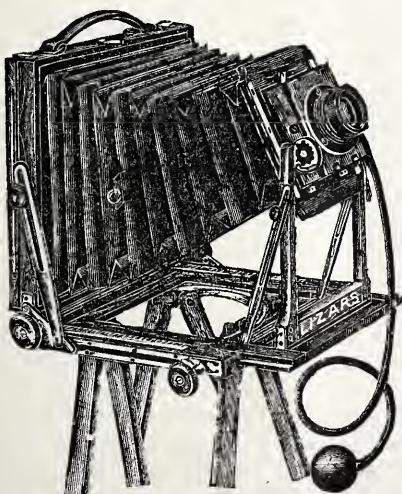


FIG. 2.

The back of the camera moves forward by means of a rack and pinion for the use of wide-angle lenses. The baseboard is also extended by the front rack and pinion, thus allowing of rack focussing for the whole extension. The front may be raised to bring the lens to the top of the plate or angled into any required position, as shown in fig. 2. The extension

of the camera is such as to permit of lenses from $4\frac{1}{2}$ to 16 inches focus being used. The Challenge interchangeable hand camera, model D (fig. 4), takes either glass plates or rollable cartridges.

When plates are being used, the back part of the camera folds over the entire dark slide, and thus prevents the possibility of light getting at the

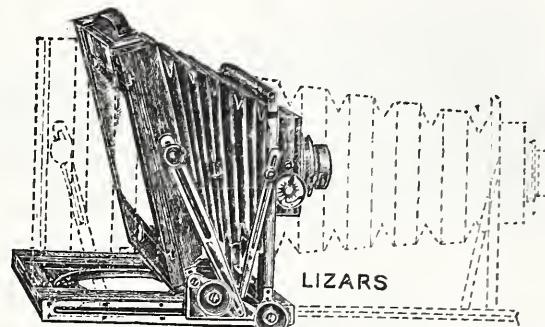


FIG. 3.

sensitive plate when the camera is exposed out of doors. With this protection the shutter of the dark slide can be withdrawn, leaving the camera ready for immediate action. Model E (fig. 5) aims at extreme compactness as may be understood from the illustration ; it is fitted with a reversing back and a double extension baseboard, and takes either a

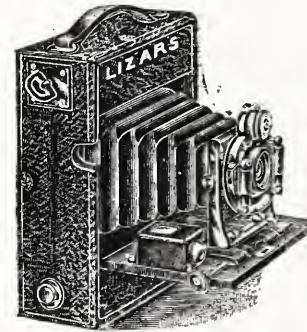


FIG. 4.

roll holder, a changing box, or slides. Model F (figs. 6 and 7) very skilfully embodies the principle of triple extension. By an ingenious arrangement, the second base is used for ordinary work, and the triple base is only employed upon those occasions when the camera is to be racked out to its

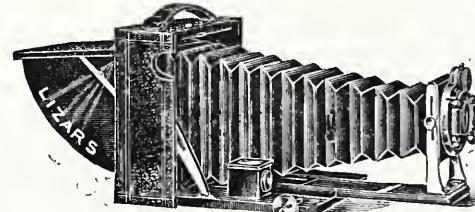


FIG. 5.

full extent. Mr. Lizar points out that the gain in rigidity of this latter system is considerable, as it overcomes at once any objection that might be made to a long extension camera for ordinary work, for which it is in every way as convenient as the short extension models, whilst it is always

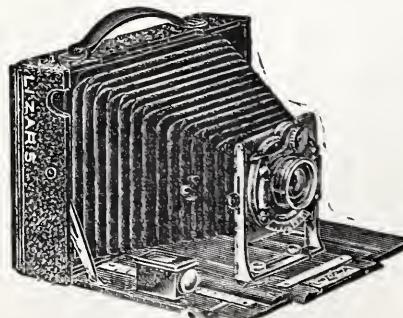


FIG. 6.

available for copying, and for use with long focus and telephoto lenses when required. The rack acts upon both portions of the baseboard, which do not require to be set by hand as in many models.

In this brief review of Mr. Lizar's cameras, the distinctive characteristics

only of these instruments have been mentioned. But we may generally and unreservedly praise their design, construction, and finish. They are well made and practicable tools with which the photographer cannot fail to be satisfied, and withal the prices are moderate. We hear much in these

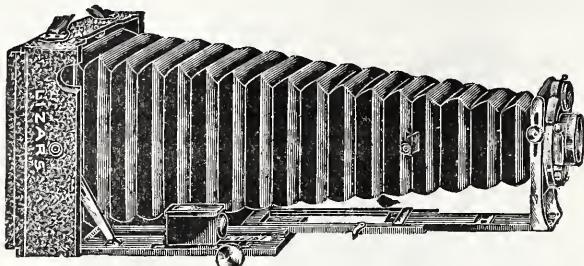


FIG. 7.

times of the supremacy of American made photographic apparatus; but though we have no means of knowing how many cameras Mr. Lizaris disposes of at his branches, we should not be surprised to find that he had the largest sale of any British manufacturer.

Studio Gossip.

AN INDELIBLE INK.—An indelible ink, the use of which in writing the public records of the State of Massachusetts is enforced by a law passed four years ago, is made by mixing together 23·4 parts by weight of pure dry tannic acid, 7·7 parts of crystal gallic acid, 30 parts of ferrous sulphate, 10 parts of gum arabic, 25 parts of diluted hydrochloric acid, 1 part of carbolic acid, and 902·9 parts of water. The Secretary of the Commonwealth decided on this ink after samples of the many inks had been tested. Writing done with the acceptable ink had to withstand the action of the sun's rays behind a sheet of glass for three months; but a more severe test than this was adopted afterwards, as, in addition to the foregoing, the writing had to be exposed for six months without protection to the action of the weather. The paper on which the writing had been executed was, before the tests, to be soaked in water, then in alcohol, and, lastly, in a mixture of the two, to determine whether the colour of the ink would fade or the ink itself spread. The ink, whose composition is given above, is said to have come out of these severe tests with every satisfaction.

News and Notes.

THE FULHAM CAMERA CLUB.—A camera club has been founded at Fulham, with Mr. Arthur C. Baldwin as Chairman. The inaugural meeting will be held on September 19 next, when Mr. E. J. Wall, F.R.P.S., will lecture on "Colour Photography."

We take the following paragraph from the *St. Louis and Canadian Photographer*: "J. P. Sullivan, of Salina, Kan., has a horse in whose right eye there is a photograph of his wife. He is offered \$500 for the animal, but refuses to sell it. The photo is a perfect likeness. Mrs. Sullivan stood in front of the horse during an electrical storm, and veterinary surgeons attribute to this fact the photo coming in the horse's eye. Its sight is not affected."

THE BRITISH ASSOCIATION.—The following is the general programme for the Bradford meeting of the British Association, which takes place next month:—Wednesday, September 5.—4 p.m., Meeting of General Committee at the Town Hall; 8.30 p.m., the President's Address in St. George's Hall. Thursday, September 6.—3.30 p.m., Reception at the Technical College (Textile Exhibition); 8.30 p.m., the Mayor's *Conversazione* in St. George's Hall. Friday, September 7.—8.30 p.m., Lecture in St. George's Hall by Professor Gotch, F.R.S., on "Animal Electricity"; 9.30 p.m., Smoking Concert in the Technical College in honour of the President. Saturday, September 8.—Excursions (half-day); 8 p.m., Artisans' Lecture in St. George's Hall by Professor Silvanus Thompson, F.R.S. Sunday, September 9.—10.30 a.m., Sermon by the Bishop of Ripon in the Parish Church. Monday, September 10.—3.30 p.m., Corporation Garden Party in Lister Park; 8.30 p.m., Lecture in St. George's Hall by Professor W. Stroud, D.Sc., on "Range Finders." Tuesday, September 11.—8.30 p.m., Corporation *Soirée* in St. George's Hall. Wednesday, September 12.—3.30 p.m., Private Garden Parties; 8 p.m., Full-dress Concert in St. George's Hall (Festival Choral Society; Permanent Orchestra; conductor, Mr. F. H. Cowen; Miss Ella Russell). Thursday, September 13.—Excursions (whole day).

Commercial Intelligence.

LANGFIER, LIMITED.—The Secretary of Langfier, Limited, 23A, Old Bond-street, writes us: "I have pleasure in informing you that, at a meeting of my Company's shareholders, held a few days since, a dividend at the rate of ten per cent., free of income tax, for the year ending June 3 last, was declared."

MESSRS. W. N. JENNINGS & FRANK M. SAWYER, who have been associated with Mr. Ives for the last four years in the developing and perfecting of the kromskop, have opened an establishment at 1213, Filbert-street, Room 613, Head Building, Philadelphia, thoroughly equipped with all the modern appliances of the art, where they are prepared to carry out anything photographic.

WITH a view of increasing British trade and spreading a better knowledge of articles manufactured in this country, the National Lecture Society are arranging a series of illustrated addresses on British Industries, to be given in all important commercial centres throughout the world. Those who are desirous of avail themselves of this movement are invited to write to the Hon. Secretary, National Lecture Society, Imperial Institute, London, S.W.

THE DEALER'S TERROR.—“We've all heard about the patience of Job, of the seeker of a government job at Washington, and other notable instances,” writes Mr. Edward W. Newcomb in the *Photo-American*, “but I do not think the poor retail photo stock clerk has a bigger and brighter halo coming to him at his necessarily early demise and entrance within St. Peter's portals than any other man. In a store the other day, a smart-looking business man bought a pound of hypo for five cents, and, when the clerk politely interrogated him as to the further extent of his desires, he said that would be all, except he'd like to ask a question. Now, the store was crowded, people were waiting to be served, and the man knew it, but what does he do but ask the clerk questions enough to fill a little book with the answers. He got something like fifty dollars' worth of information at current rates, riled the clerk and the customers, some of whom left without buying (maybe THEY wanted half a hundred dollars' worth of information with a five-cent purchase, too), and departed with a condescending word or two, as much as to say that his patronage was valuable indeed. The worst of it all was that he remarked to a friend as he left that he didn't think the clerk knew what he was talking about, and that he was not very obliging any way. Ten years ago we made decent profits on photographic materials, and could afford to throw in quite a considerable instruction gratis; but now, when there is no profit on plates at all, but little on supplies in general, and prices are cut to a level where nothing but quick sales will afford a man his living, no advice can be given. The dealer should have an expert at the disposal of patrons, but should charge for his words just as they would for their hypo. I really believe both dealer and patron would be better pleased at this arrangement than with the one in general practice now.”

Patent News.

THE following applications for Patents were made between July 16 and July 21, 1900:—

PHOTOGRAPH FRAMES.—No. 12,779. “Improvements in Photographic Frames.” A. P. SHANN.

CINEMATOGRAPHY.—No. 12,820. “Improvements in Apparatus for Taking and Viewing or Exhibiting Cinematographic Pictures.” G. F. HATTON and A. N. WHITEHEAD.

HAND CAMERAS.—No. 12,957. “Improvements in Hand Cameras.” E. WILSON.

LIVING PICTURES.—No. 13,076. “Improvements in and relating to Apparatus for the Production of Moving or Living Pictures.” W. P. WARREN.

X-RAY APPARATUS.—No. 13,199. “Improvements in and relating to Röntgen-ray and like Apparatus.” F. L. MUIRHEAD and R. H. EDGAR.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
6.....	Bootle	{ Excursion: Delamere Forest. Leader: Thomas A. Dodd.
6.....	Croydon Microscopical	{ Excursion: Chilworth and Gomshall. Leader, H. D. Gower.
6.....	Southampton	Print Competition: Snap-shots.
9.....	Ashton-under-Lyne	Meeting to Examine and Discuss Results of Rambles to Bolton Abbey and Bakewell.
10.....	Croydon Microscopical	Conversational Meeting.
11.....	Borough Polytechnic	{ Excursion: Leatherhead. Leader, E. W. Burch.
11.....	Croydon Microscopical	Excursion: Netley Heath and Gomshall.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 26.—Mr. F. W. Mundy in the chair.

Mr. PHILIP EVERITT passed round a negative taken by quite a beginner which, but for marks caused by the developer being only partially applied to the plate, was a very fair result. But the said beginner was so confident that he had properly covered the plate with developer that he agreed that the London and Provincial should report upon it. Mr. Everitt's decision was entirely confirmed.

Mr. E. T. WRIGHT showed a negative reduced with persulphate of ammonium. Before treatment it was quite free from stain and was a good negative, but during reduction one end of the plate became deeply stained with an opaque brown deposit or mud.

Mr. A. L. HENDERSON was inclined to attribute the trouble to careless handling, and thought it probable that it had been placed wet on a dirty shelf or bench from whence it had picked up the stain.

Mr. E. T. WRIGHT also exhibited a foggy negative terribly marked with pinholes and reticulations. It was developed with pyro in the ordinary way; ten plates were good and two bad.

Mr. W. T. WILKINSON put the trouble down to development in warm solutions.

Mr. R. P. DRAGE thought hasty drying would give the result shown.

Mr. S. H. FRY informed the meeting that the celluloid measures, for which Mr. Henderson had so often expressed a desire, were obtainable according to the list of a firm he passed round. They were of German make, and were marked in English and French systems. It was also said that an English firm made these articles.

Mr. HENDERSON referred to Mr. Howard Farmer's paper on desiccated dry plates before the Convention, which carried him back to experiments of his own performed twenty years ago. There were, he found, distinct advantages in wetting a dry plate before exposure and allowing it to get surface-dry. A negative of a different character to that ordinarily obtainable was the outcome, greater contrast being the result. In reply to a question he added that a wet-collodion negative became more intense as it dried, but not so the gelatine, which grew thinner as it dried. Increased density might be given to the gelatine plate by bathing it in alcohol.

Mr. DRAGE drew attention to the extent to which cheap collotype imitations of silver prints were superseding the genuine article. He rather regretted this tendency in the view business, but it was very true on the Continent.

FORTHCOMING EXHIBITIONS.

1900.

August 21.....	Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
Sept. 21-Nov. 3	Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
October 1-Nov. 3 ...	Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
November 12-17	Ashton-under-Lyne.
" 21-23	Hackney Photographic Society.

1901.

January 14-19	Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.
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Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

WAR BUTTONS AND BADGES.

To the Editors.

GENTLEMEN,—Your leaderette, entitled "War Portraits," in a recent JOURNAL interests us particularly in the question of the woe-begone state that your correspondent has noticed that some of these badges and buttons present after continued exposure to light. Of the enormous quantity of prints that have been used for this purpose we have sold a number of millions, printed by the bromide contact process, and have not found a single case of fading through imperfect fixation, and we have seen our productions in the retail fancy shops everywhere. We will say, however, that on account of the extraordinary rush there has been for these small photos, several new and inexperienced firms have gone into the button-making business, and much of the yellow colour noticed is nothing else than an oxydation of the thin iron shell, or support, through the use of an imperfect method of fixing the enamelled surface to the prints. We might say that our managing director—the writer—was the first in this country to make tools to manufacture photographic buttons, and it took him a lot of time to discover the most perfect system of manufacture. We claim to-day that our machines are the most up to date in existence, being our own special designs, and by the samples, which we herewith send, you will note that we can make buttons or medallions in various ways.—We are, yours, &c.,

CRAYON LIMITED: F. A. VENNING, Managing Director.

49, Brecknock-road, London, N., July 25, 1900.

[Our correspondents have been kind enough to send us a considerable assortment of their popular war buttons, both in monochrome and colours, together with samples of American and English-made

"fittings" upon which the little pictures are mounted and varnished. The latter are reproduced in a variety of ways—Velox, P.O.P., bromide, and printer's ink being employed to obtain the impressions. The hand colouring is exceedingly good, and altogether these photo-buttons are attractive little ornaments.—EDS.]

THE RÖNTGEN RAYS.

To the Editors.

GENTLEMEN,—In your issue of the 22nd ult. you publish some remarks by Mr. Noble, president of the Röntgen Society. He speaks of the benefits which the great invention has bestowed on our wounded soldiers, and says that its usefulness is on the increase. It must be a source of satisfaction to the persons, those who perfected the rays and those who apply them, to think on the amount of suffering which they now render unnecessary. In connection with the widening of their application, might I inquire if a mouth doctor could use them with advantage? A patient may be annoyed by a tooth travelling in the interior of the gums, in which case I venture to think it would be beneficial to have the annoyance located.—Thanking you in anticipation, I am, yours, &c.,

WILLIAM FISHER.

18, Albert-street, Dundee, July 25, 1900.

[Our contemporary, the *Pharmaceutical Journal*, a few weeks ago printed a paper on the subject of the X rays in dentistry, to which we refer our correspondent. The *Journal* is obtainable at 5, Serle-street, Lincoln's Inn, W.C.—EDS.]

ITINERANT PHOTOGRAPHY IN THE ISLE OF MAN.

To the Editors.

GENTLEMEN,—I herewith enclose you page from a local paper, thinking it would be of interest to you. Being one of the "pests," I will give you my version. Some ten years ago I came here as operator for a firm, when this business was just taking root—the photographing of the visitors on the steps of the boarding-house—and so popular did the business get that it was no infrequent occasion but that we had orders to go and take from six to eight groups a day. The consequence was that the firm I was with laid themselves out for the work, sending a man out at breakfast-time to make appointments for dinner and tea-time, the sun being on these particular houses first thing in a morning, and the thing became an institution and became very popular. After being with this firm three seasons I started for myself, and a number of others came there, being, at the present time, some dozen to twenty doing the work; and, like myself, the majority submit proofs before asking for orders, so that the visitors see what they are going to have for their money, and there is no compulsion for them to order. The authorities are instructing the police to stop us although there is no by-law. We tell them, if we cause any obstruction, to summon us and give us a chance of defending ourselves, but they will not. It is simply dog in the manger. The natives will not do it themselves, and they object to us, as the majority of us come from across the water, and they say we have no business here as we bear no share of the taxes. I say we do, and pretty heavy for what we get. Well, that's my experience. The plates are whole-plate P.O.P., on plate-sunk mounts, and the price 1s. 6d. per copy. I enclose you a rough print of group I took last night, so that you will be able to judge. The island is maintained by visitors from across, but yet no one from across must come here to do business; and this is a fair sample of the clannish principle of Manxmen.—I am, yours, &c.

PYRO.

The extract referred to is as follows:—

Amongst the pests of the Isle of Man season the itinerant photographer occupies a fairly prominent position. He comes with the visitor, has no shop, pays no rates, requires no licence, and goes from door to door, soliciting work and executing his orders on the steps of the houses then and there. The work is never of a high order, the money has to be paid down, and the visitors are expected to place their simple faith in him along with their shekels. The Town Council might very well consider whether some of these gentry are not within the reach of the by-laws relating to hawkers.—*The Manxman*.

[The print which our correspondent encloses would do credit to any photographer; it is a capital specimen of group work. The remarks quoted from the *Manxman* do not flatter the writer's intelligence. The "execution of photographic orders on the steps of houses then and there" is a feat never performed outside a Manx newspaper office. As to the point at issue: a photographer who calls at houses soliciting orders is surely no more of a pest than other visitors on business bent, and probably causes less obstruction than butchers, bakers, and other tradesmen. In the group before us there are some thirty or forty middle-class visitors who appear rather pleased than otherwise at being photographed. Until visitors to the Isle of Man complain of the "pest" of being photographed at their boarding establishments we imagine that there is no call for the intervention of the local authorities or the local press.—EDS.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED :—

W. Harrison, Holly Bank, Onchan, Isle of Man.—Two photographs of steamer "Lily" on rocks.

G. T. C.—We are much obliged for your letter.

STAINED AND SPOTTY PRINTS.—S. R. W., SPOTS, W. WADE, and SPOTTY. An article on the subject will appear next week.

W. G. BURRELL (Wandsworth).—We are much obliged to you for your letter and enclosure. The patent specification of the invention was printed in the JOURNAL of July 20.

COPYRIGHT.—MEZZO asks: "If a copyright photograph of a group has been acquired, is it an infringement of that copyright for a stranger to take out of that group a copy of one of the figures in it?"—In reply: Undoubtedly.

PREPARATION OF PLATINUM PAPER.—UNION would be glad to know where he can obtain information by which he could make his own platinum paper.—In reply: You will find some useful information on the subject in Abney & Clark's *Platinotype*, published by Sampson Low & Co., Fetter-lane. In this JOURNAL of June 15 last a lengthy article also treats of it.

STUDIO FURNITURE.—ACCESSORIES writes: "Will you kindly tell me where I can obtain proper studio furniture, such as a chair with several backs or a short settee?"—In reply: Messrs. Marion & Co., Soho-square; Houghton & Sons, High Holborn; Fallowfield, Charing Cross-road; and other firms whose advertisements appear in the JOURNAL supply studio accessories.

AMY CASSELS.—No complaints similar to yours have reached us. From your description of the defects we should not look for the cause in the paper. They frequently appear when a negative has been used in silver printing and through slight damp particles of silver salt have been conveyed to the surface of the platinum paper. This or some other equally simple explanation may account for the failure.

THE PLATE-MAKERS' ASSOCIATION.—D. T. B asks for: "1. The address of the Plate and Paper Manufacturers' Association. 2. Is it necessary to have a licence for the sale of photographic chemicals, &c., and where obtainable, and price?"—In reply: 1. Address The Secretary, London Chamber of Commerce, Boltoph House, Eastcheap. 2. No; but the Association has arranged a scale of discounts for *bond-fide* dealers, &c.

SPOTS ON PRINTS.—SPOTS writes: "Would you kindly tell me the cause of spots on the enclosed prints, as I have been much troubled with them of late. At first I thought it was dust, but have taken care to see that there was no dust about, with the same result."—The spots have all the appearance of having been caused by dust. If they are not, they are probably due to metallic particles in washing waters—iron rust, for example.

COPYRIGHT.—ARTHUR writes: "I have a photograph of a stranded vessel under very difficult circumstances, and the negative is turning out very valuable. I have sold a dozen copies or so, and expect a good sale. Having sold those, will it debar me from securing the copyright if I send you the usual 1s. 6d., &c.? I took it on 'spec,' not an order. If I can legally copyright, and anyone copying from the prints I have disposed of, I take it that they are liable. Is it so or not?"—In reply: Registration will give you legal protection for the copyright, for any subsequent infringement of which you can recover.

NIEVSKY'S APPARATUS.—CRUUBEEN asks: "1. Where automatic cameras can be purchased. I mean those which you simply expose, then allow the plate to drop into developer. Photographs are sold at 2d. or 3d. 2. If I was to take one of those cameras to a seaside place, what should I have to do, either to stand on sands or road close by? 3. Is there any special place that you could recommend?"—In reply: 1. Write Mr. Nievsky, Avenue Road Villas, Shepherd's Bush. 2. You would have to comply with the local regulations. 3. We have seen the machines in successful use in large towns—of seaside places we can say little, as we avoid them.

ENLARGING.—R. M. writes: "I enclose an enlargement I took yesterday from a quarter-plate negative. I am a novice at enlarging, and do not understand the cause of the black granular deposit in the sky. May I ask you to be good enough to assist me? The development was by the Wellington formula and amidol; exposure, twenty minutes with *f*-16. May I also ask you to be so kind as to criticise the print for me?"—With the exception of the granularity in the sky, the print is fairly good. So far as we can judge, the granularity seems to be due to the developer not being kept in motion while the print was in it, or, maybe, too little solution was used. Try with a larger quantity of solution, and keep the dish rocking all the while the picture is in it.

DAYLIGHT ENLARGING.—BOB TIMMS writes: "I have an enlarging lantern with a six-inch condenser. Will you please tell me how it should be fitted into a window, north aspect, so that I can use it for enlarging by daylight?"—No condenser is required for daylight enlarging, it would be of no use. Simply fix the negative at the window, with a piece of white cardboard outside at an angle of 45° to reflect the light through it. It is scarcely necessary to say that all light should be blocked out from the window that except coming through the negative.

"ECZEMA THROUGH TONING" (?).—E. CAVE writes: "Could you give me any information as to the cause of my fingers breaking out and keeping raw for the last three months? The toning baths that I use every day are as follows:—Ammonium sulphocyanide, acetate bath, for silver prints; phosphate of soda bath, for the Aristo paper (American). Also, platinum chloride and phosphoric acid, for the same paper as above. Do you think that either of these chemicals would cause the breaking out on my fingers? It's the same as eczema. I have never had it before, or eczema either."—We do not think that either of the three first-named baths would cause the evil. We have, however, heard of the platinum toning bath producing skin troubles. We should advise you to consult a medical man who makes a speciality of skin diseases.

WET-COLLODION POSITIVES.—COLLODION writes: "Would you be so kind as to explain the method for making wet-collodion positives direct? I believe this can be done by treating the negatives with nitric acid, but so far my results have been extremely thin and faint. An ordinary negative backed with black paper will not do, I want the genuine article. Or, if you could refer me to any work on the subject, I should feel obliged."—The formulæ for wet-collodion positives are given on pp. 1088 and 1089 of our ALMANAC. But these will not help you much, as you are quite unacquainted with the process, without full working details. These our space is too limited to give in this column. You had better get any of the old works on photography published twenty or more years ago. All of them contain full details of the process.

A COPYRIGHT MATTER.—COPYRIGHT states: "Some time ago I photographed a building for an advertising firm, and sent them finished prints, also to the people living in the house, without charging them, after which I copyrighted the negative, and have since found that some members of the Mercantile Association have made use of the photograph by ordering a London firm to make a block from same for an illustrated book advertising the place. I have accepted an apology from the Association, but shall be glad if you will tell me if I can recover any compensation from the London firm who made the block, or from the party who printed the book and used the block, who also sent the photograph for the block to be made from."—In reply: Strictly speaking, all those concerned in the reproduction of the photograph are liable; but we doubt if in this case you can recover, as you have accepted an apology from the principal offenders. Better have a solicitor's advice on the point.

STUDIO-BUILDING.—"ONE IN TROUBLE" writes: "I have lately had the roof of my studio altered from 35° to 60° degrees, as H. P. Robinson recommends, thinking that I should improve my work by so doing; but I find that now the shadows are very strong and there is a loss of detail all over, and my sitters are complaining that they look old; in fact, there is no roundness. My studio faces east, is 10 feet wide, 13 feet to ridge, and 7 feet 6 inches to eaves. There is a building on my side about 25 feet high, and distant 70 feet. There are also houses on my front—about 25 feet high, and distant 30 feet. I use dark blue blinds as hitherto, but I seem to have no control over the effect of lighting, as immediately I draw a blind it gives flatness. It seems that more light is required in front of the sitter."—If you got good pictures before the alteration, it is clear that the studio is not improved by the alteration. Or maybe you have not adapted yourself to the altered conditions. If you had sent us a print or two, we might have been able to help you. As you complain that the portraits have no roundness, we suspect you are employing too much direct front top light. Try the effect of stopping off more of the light towards the ridge.

VARIOUS.—VALUE writes: "1. I have been troubled, when photographing in damp, foggy weather, by moisture collecting on the lens; could I, to obviate this, when using a R.R. or single landscape lens, whilst focussing and arranging my picture, by placing on the hood of the lens a cap with a piece of plain glass (optically prepared), removing the same just before exposing the plate? You will readily follow the plan I propose to adopt, but I wish to know whether, when this cap of plain glass were removed, I should have to refocus, or would the removal of the plain piece of glass in front in no way affect the focus of the image? 2. I notice that the Thornton-Pickard Company sell a 'new patent time exposure valve,' giving exposures $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, 1, 2, 3 seconds; are the results obtained by this valve sufficiently accurate for you to advise any one buying one of their standard time and instantaneous shutters with speed indicator to have it (the valve) attached? 3. For general work, including architecture interiors, do you consider, with the facilities for enlarging, and when exhibition pictures are aimed at, that the user of a half-plate camera has the pull over one using the 5×5 size? I ask this, as many people advocate the half-plate, which, besides being heavier and more costly to work, does not seem to give the shaped view that we see in nature so well as the square one afforded by the 5×4 size."—In reply: 1. The simplest and best way to avoid the condensation of moisture on the lens is to make it slightly warmer than the surrounding atmosphere, then no moisture will condense upon it. Place the lens in the sun for a short time or carry it in the pocket, either will warm it sufficiently to avoid the trouble. 2. This is a different arrangement, and is complete in itself. 3. It is much a matter of taste, but we ourselves prefer the half-plate size to the 5×4.

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EX CATHEDRA.

THE Controller-General of Patents has sent us a copy of the first of a new bibliographical series in course of issue by Her Majesty's Patent Office. It is a book of sixty-two pages, giving a subject-list of works on photography which are to be found in the Patent Office Library. At the end of an introductory note Mr. Dalton tells us that the list comprises 557 works (73 serials, 484 text-books) wholly or in part photographic, representing some 1300 volumes. The catalogue entries relating to these works number 708, and are distributed under 68 headings and sub-headings. A study of the catalogue, which includes foreign as well as English works on the subject of photography, shows, of course, that this section of the Patent Office Library is not entirely complete, and that many books are included which are of very little value indeed for purposes of reference. There is no photographic library with which we are acquainted—and we have had occasion to consult and inspect most of those in London—that would not be the better for the elimination of many useless and redundant volumes. The list before us, however, is a serviceable compilation, and it

bears evidence that an attempt has been made to bring the Photographic Section of the Patent Office Library well up to date. Only a very few years ago, when we were constantly making reference to the photographic books in Southampton-buildings, the absence of many standard volumes was the subject of frequent inconvenience. That reproach has been very largely removed, and the list before us should therefore be welcomed by students and others interested in the literature of photography.

* * *

IF any reader of the JOURNAL owns a whole-plate camera that may be employed for studio and outdoor work, and for which he has no further use, we shall be pleased to be the channel of its disposal for a worthy object. There has been brought to our notice the case of a photographer who, at seventy-five years of age, has had to pass through the Bankruptcy Court, but who is anxious to recommence work with the remains of his old outfit. His camera during the time it has been in the hands of trustees, &c., has become dilapidated beyond repair. From personal knowledge, the case is certified to be a deserving one, and we are assured that the camera would provide the unfortunate photographer with the means of earning a living. On several recent occasions we have regretfully had to mention the fact that the Photographers' Benevolent Association has passed out of existence, so that in distressing emergencies of this kind recourse must, for the future, be had to private sources of assistance; and, as we know only too well, distressed and unemployed photographers increase rather than diminish in numbers. There must be many well-to-do photographers having an idle or unused whole-plate camera on hand, and we sincerely hope one of them will come forward with an offer to help a brother fallen by the way.

* * *

FROM a circular that has been addressed to us, we are pleased to learn that Mr. H. C. Shelley, the able photographer and journalist, who spent eight months with the British Army in South Africa as special war correspondent for *The King* and the *Westminster Gazette*, proposes to deliver an illustrated lecture descriptive of the realities of the conflict in that country. Mr. Shelley's war experiences embrace actual knowledge and personal eyesight of all the chief events of the campaign

on the western side, including the battles of Modder River and Magersfontein, the relief of Kimberley, the surrender of Cronje on Majuba Day, the march to and occupation of Bloemfontein, and the advance on and capture of Brandfort and Kroonstad. We further learn that Mr. Shelley was the only correspondent who was allowed to make an ascent in the war balloon, and during the halt at Bloemfontein he was accorded special privileges by Lord Roberts to enable him to secure the only pictures in existence of many historic incidents transpiring in that town. The opponents of photo-faking will be pleased to be told that, as so many frauds have been perpetrated on the public in the shape of posed photographs and fancy sketches by artists who have not seen what they attempt to depict, special attention is called to the fact that Mr. Shelley's battle pictures were secured during actual engagements, and are absolutely devoid of "faking." Applications for dates and terms for Mr. Shelley's lecture should be addressed to The Lecture Agency, Limited, The Outer Temple, Strand, London, W.C.

* * *

THE lecture, which is entitled "War on the Veldt," will be illustrated by upwards of two hundred lantern slides, and the following is the synopsis: With Sir Redvers Buller to the Cape; General French in a Basket; Transports in Cape Town Docks; Through the Karroo to the Front; Orange River Camp; Breaking out of Bounds; Belmont and Graspan; Modder River Battle; The Struggle at Magersfontein; Two Months of Camp Life; Up in the War Balloon; Round the Forts of Modder River; Jack and his Gun; Exploring the Boer Position at Magersfontein; In Kimberley; Cronje surrenders on Majuba Day; Bloemfontein in British hands again; Life at the Presidency; A Dinner with Lord Roberts, Sir Alfred Milner, and Rudyard Kipling; Off to Pretoria; Brandfort; A Fight at the Vet River; How Lord Roberts entered Kroonstad; Some Personalities of the War, including General Hector Macdonald, Padre Robertson, General Pole-Carew, General Sir Henry Colville, General French, Sir Alfred Milner, and Lord Roberts. We possess every number of *The King* containing reproductions of Mr. Shelley's photographs and his vividly written articles. He has evidently accumulated a wealth of splendid material for his lectures, which should be extremely popular.

* * *

IN last week's JOURNAL we briefly announced the formation of a new camera club at Fulham, and we have since been supplied with further particulars relating to it. The President is the local member of Parliament, Mr. W. Hayes-Fisher, an energetic politician, and the Vice-President is Mr. F. O. Drew, J.P., Chairman of the Fulham Vestry. The other officers are as follows: Chairman of Committee, Mr. Arthur C. Baldwin; Vice-Chairman, Mr. Franklin T. Barrett; Hon. Treasurer, Mr. C. Pretty, North End-road, Fulham; Committee of Management, Mr. W. F. Crawford, Mr. D. Barker, Mr. H. R. Parry, Mr. E. Gabrielli, Mr. E. J. White, Mr. S. Toyer, and Mr. Hearn; Hon. Secretary, Mr. A. E. Littleboy, 8, Fulham-park Gardens. The headquarters of the club are at 40, Darlan-road, Fulham, and it is proposed to hold meetings on alternate Wednesdays from September to April. The subscription to the club is only five shillings per annum, and an excellent start has been made with a membership of forty. In suburban London there are wide fields of usefulness open to photographic societies, the success of which mainly rests on the administrative abilities of the officers. There is no lack of business acumen and photo-

graphic knowledge on the Committee of the Fulham Camera Club, to which we extend a hearty welcome, coupled with good wishes for a prosperous career.

* * *

FROM time to time the public learns of the many millions of small prints by the bromide process that are prepared for the decoration of cigarette boxes and similar purposes. They are often mistaken for collotypes. This process, however, has not hitherto met with such a degree of support as its convenience, good qualities, and comparative inexpensiveness should have assured for it. However, we learn from the well-known house of Messrs. Morgan & Kidd, of Richmond, that they are experiencing a demand for collotypes specially produced to advertise articles in popular demand. Before us is a set of little pictures, naval and military subjects, which Messrs. Kimball, of Old Gold cigarette prominence, are attaching to their boxes. There is also a half life-size portrait of Field-Marshal Lord Roberts, prepared by the same process for publicity purposes. These collotypes, though turned out in great numbers, lack none of the qualities we look for as a matter of course in photographic prints; indeed, at a first glance, they might easily be taken for albumen prints, so closely is the imitation often carried. Only recently we had the pleasure of inspecting Messrs. Morgan & Kidd's collotype department, wherein all grades of this branch of printing are executed. We hope their work will find its way on to many millions of cigarette boxes, for it is exceedingly good and cheap.

* * *

BRITISH photographers will be interested to know that the Great International Exhibition to be held at Glasgow next year will have a unique display in the Photographic Section. A representative collection of the world's pictorial photography is to form a notable feature of the Exhibition. A large gallery, considerably over a hundred feet long, will be devoted to the photographs, which will be obtained by invitation. Mr. J. Craig Annan, who is the "convener" of the Committee having charge of this special department, has just returned from a month's visit to the Continent, chiefly occupied in arranging for exhibits from the principal Belgian, French, German, and Austrian photographers. It is rather more than a year since Mr. Craig Annan assured us of his determination to make the Glasgow International Exhibition the occasion of the finest display of pictorial photographic work that has yet been organized, and there is every prospect of his complete success. Of course American and British work will also be represented. With such an inducement as this, it should be the duty of every photographer to visit Glasgow next year. The Paris Exhibition, as we have already remarked, signally fails to do justice to the higher branches of photography, but we anticipate that the great city on the Clyde will achieve all that is possible in the matter.

IMPERFECT FIXATION ONCE MORE.

To many of our readers it may seem like a thrice-told tale to again refer to the subject of the fixation, or rather the non-fixation, of silver pictures, so often has the subject been dealt with in these columns. Still, rarely does a week pass that we do not receive one, two, or three queries, for replies in the Answers column, as to the cause of stains or spots on prints. Last week we dealt with two, this we have received three.

Usually, if the stains appear on the prints before they are mounted, the querists seem either to suspect fault in the paper, or that an assistant has not properly washed them. If, on the other hand, the stains are not apparent until some little time after the photographs are mounted, then the mounts are generally suspected of being the cause. In nine cases out of ten the queries could be answered in two simple words—imperfect fixation.

It is a noteworthy fact that the majority of these queries do not come from inexperienced amateurs; if they did, it might not be surprising; but they come from professional photographers employing assistants. One might reasonably surmise that the former would be sufficient masters of their craft to at once recognise the cause of the defects by the character of the stains, or other defects by their appearance; or, if not, they certainly were able to do so by overlooking the work while in progress. Evidently that is not the case; hence the number of queries we are constantly receiving. Usually the queries are tersely put, in something like the following words: "Please tell me the cause of the stains on enclosed prints." Often the following, in effect, is added: "My printer tells me he (or she) takes every care in the washing," &c.

Last week a correspondent, in his query, adds, "Of course, I cannot say that my printer is truthful, but he appears to take every care, and is anxious." The print forwarded by this correspondent was from a fairly good 12×10 negative, and the cause of its yellow, iridescent appearance and mottleness, when viewed by transmitted light, could be recognised at a glance by any one who had but a superficial knowledge of his craft. The print had either been put into a very weak solution of hypo, or merely passed through a stronger one without time being allowed for it to do its work. In either case the chloride of silver was but partially converted into the soluble hypo and silver salts, hence the stained and unfixed appearance of the photograph. Yet the employer evidently did not know the reason, therefore his query to us.

Stains are frequently put down to the *carelessness* of printers. This is a charge that, in many instances, we are inclined to enter a protest against on behalf of the *employés*, and would substitute lack of knowledge in place of the term *carelessness*. Printing is now too frequently intrusted to lads and girls, taken as apprentices, with or without a premium, so as to get the work done as cheaply as possible—in some cases for nothing. Now, how can employers, who themselves are so ignorant of their craft as not to know the cause of stains, spots, &c., such as they so often seek information upon, teach their apprentices the trade? It is very evident that some that write to us on these and similar things do not understand photography and the fundamental principles involved in its practice. These outspoken words, which we use in the interest of photography itself, we hope will give no offence to any one. Our object is simply to uphold the credit of photography, which the numbers of stained and fading pictures to be met with daily is seriously impairing.

If the proper conditions are fulfilled, there is no reason whatever why silver prints should not be permanent, or at least reasonably so, instead of passing into the "sere and yellow leaf" within two or three years—often much less. Silver prints by hundreds—nay, thousands—are in existence that were made thirty and forty years ago that are now, practically, unchanged; and, what is more, they were produced at a time when far less was known on the theory of the subject than

should be the case now; though, in spite of technical schools, it evidently is not by many, either employers or *employés*.

Often the queries relate to yellow spots which make their appearance some time after the prints are finished. These, in the majority of cases, are due to air bubbles adhering to the surface of the papers when they are put into the fixing bath, thus preventing the free and equal action of the solution, and thereby causing imperfect fixation in those places. One would naturally imagine that every employer could at once localise this defect, and so set his *employés* right in the matter, and it is really surprising that so many are unable to do so. Often the stains submitted to us are due to the prints not being kept in motion while they are in the fixing solution or have been allowed to stick together, so that, again, the hypo does not get free action equally all over the prints; or, maybe, as is often the case, too little solution is employed, and then unequal action is unavoidable. Every one knows that, unless prints, in toning, are kept in continual motion and are not permitted to stick together, uneven tones are the result. Here the effect is seen at once. Precisely the same conditions prevail in the fixing of the prints as in the toning of them, but here the effect is not at the time visually apparent; it only becomes manifest some time afterwards—perhaps in a week, month, or maybe years, but the cause is there from the first.

As we have just intimated, we hope that this somewhat strongly worded article, written in the interests of photography, will be read in no unkindly spirit by any of our readers. On a future occasion we may possibly have something more to say on the subject of the fixation of silver pictures.

The Bank Holiday and Photography.—All who had to travel in the neighbourhood of London a day or two before the Bank Holiday could not well fail to notice the many reminders there were at the different railway stations of photography. Hand cameras and tripod stands seemed to be in evidence everywhere. During the two or three days preceding Monday last we had to make several journeys in and round London, and could not help noticing how photography seemed to be becoming more and more popular, if one could judge by the numbers who were carrying photographic paraphernalia, though we fear that many were much disappointed with the weather experienced. While noticing the number of travellers we met with photographic impedimenta, we could not help thinking the boon it would be to them if they were enabled to travel at reduced fares. At various times there has been agitation in the amateur photographic world to secure that end. While considering that matter, the reflection is suggested to us, if the boon were granted, what a material difference it would make in the railway companies receipts, seeing the large numbers that were *en voyage* with photographic kits.

Collotype Views.—At a recent meeting of one of the metropolitan photographic societies a member drew attention to the extent to which cheap collotype imitation silver prints were superseding the genuine article. He added that he rather regretted this tendency in the view business, but, he said, it is very true on the Continent, and he might have added that it is very true in England. Some of the very worst collotype views that have come under our notice, we are sorry to say, were produced in this country, and some of the very best on the Continent. Both good and bad are made everywhere. We have in our possession many collotypes which no one but an expert could detect as not being "the genuine article" if the standard of that be a silver print. More than that, the collotypes are unquestionably permanent, while no such claim can be put forward for the so-called "genuine article." Now, the collotype is,

apart from its undoubted permanence, one of the most beautiful processes of photography, for it is capable of yielding results that are unsurpassed by any other. Unfortunately it is also capable of yielding results as bad as any other when unskilfully worked, and that is, we regret, too often the case when it is worked commercially and price is the chief consideration. The best collotypes cannot be produced rapidly, as commercial work is too often done both at home or abroad. At one time in this country machine collotype work was looked upon as necessarily being inferior to hand-press work, but we unhesitatingly say that better results are produced by machine than is possible in the hand press. But—and here is the crux—the machine must be worked with brains, and at a very much slower speed than is usually the case in commercial work. With the hand press, when the impression is taken from the plate, there is an end to the matter. Not so with the power press, for, by the movement of a lever, the print is retained *in situ* on the cylinder while the plate is being inked afresh, and a second print can be taken superimposed on the first one, and even a third or fourth or more can in the same way be taken at will. In this way any amount of vigour in the print can be obtained. It is tolerably well known that collotype plates with the finest grain are the most delicate and difficult to print, owing to their slight ink-holding properties, but, when two or more impressions are superimposed the one on the other, great vigour is obtainable; but it is obvious that two printings require double the time of one printing, and a proportionately increased cost is incurred in executing the work.

Vanishing London.—Those who have passed through the Strand lately need not be reminded that at last the Strand improvement has commenced in earnest. The houses backing on Holywell-street are for the most part cleared away, but the old thoroughfare with its overhanging houses is yet practically intact. Those of our readers who yet desire to obtain photographs of this old street should lose no time in securing them, and for two reasons: First, the street is very narrow, and runs nearly due east and west, and the best time to secure pictures of it is when the sun is near the zenith, then the street is the best lighted, and the best results obtained; each day now the sun gets lower, and by the time it next reaches its present altitude Holywell-street will probably, be a thing of the past; second, securing photographs of disappearing London is often delayed until the buildings have passed into the hands of the bill-posters or those of the "housebreaker." Although houses may not be pulled down for some time after their fate is sealed, they are often disfigured by posters or hoardings long before they are, so that photographs of them in that state are worthless for all historical purposes. Many of the houses in the neighbourhood of Clare Market from which Dickens drew so many of his pictures are already thus disfigured, but many are yet intact, though they will not remain so for long. Therefore we again remind those who wish to secure mementoes of "Dickens' Land" to lose no time, now that the light is favourable to getting them.

Art Training and Photography.—This is how Sir W. B. Richmond, R.A., proposes to revolutionise art-teaching. We read that he would place in a well-lighted room photographs of the finest pictures of the world, as well as some tables and chairs, and pencils and paper; and he would let the working man go there and absorb the beauties of art until they became part of his nature; furthermore, he would let him smoke his pipe in the mean time if he cares to do so. His idea is that in time the man would begin to copy the beautiful things around him, and would have developed in him the most human part of his sensibilities. This, in effect, is what Sir W. B. Richmond said at the opening of the Loan Exhibition of Pictures at Deptford last week. The idea is certainly excellent in theory, and one would like to see how it would work in practice. The local photographers of Deptford would certainly do well to study the pictures now being exhibited at the Sayes Court Hall, for we must confess that many of the portraits shown in some of the Deptford photographers' show-cases are certainly not of a very high

art order. By the way, speaking of photographs of the best paintings of the world, it may not be generally known that permanent pigment prints, about nine inches by seven, of the best pictures in our National Gallery and Continental National Galleries are to be had retail for 1s. each. These should prove an immense boon to art students of limited means.

PARIS EXHIBITION NOTES.

III.

THE historical photographic exhibits at Paris are extremely interesting, although we may be sure from analogous experiences at home that they will not secure much notice from visitors. We have observed over and over again that modern photographers care very little for that kind of photographic history which is illustrated by examples of obsolete processes and specimens of out-of-date photographic appliances. At South Kensington, in the Museum of the Royal Photographic Society, at the Camera Club, and at the Photographic Club, many precious relics are stored, but you seldom hear of instances in which they are disturbed for purposes of inspection or study. And yet a conscientious endeavour to acquaint oneself with the evolution of photographic practice and the chemical, optical, and mechanical influences that have been at work can only be properly satisfied by a careful contemplation of applied photographic history as it is shown in these collections of antiquities. One class in particular—manufacturers—would profit immensely in this manner. Many old ideas would probably present themselves as worth resuscitation to-day, and, on the other hand, disillusionment of an instructive kind might attack some cherished beliefs in the novelty of several modern inventions.

The historical loan collection at Paris owes its existence to the efforts of the Société Française de Photographie, and the large case in the French section contains specimens of apparatus and examples of processes from Daguerrean times down to the present. Two or three modern apparatus makers, who claim the idea as original, should feel comfort at the information that Dr. Monckhoven's cross-wire "finder," originally introduced in 1866, finds a place in this collection. Panoramic photography, which will not improbably regain favour in the immediate future, is illustrated by some Daguerrean panoramographs, truly fine examples of accurate exposure and good definition. The chrono-photographic work of M. Marey is shown in all its stages, and there are examples of Du Hauron's tricolour heliochromy, dated 1868–1875, which, so far as we could judge from a necessarily cursory inspection, are exceedingly correct in colour rendering. A magnificent spectrum, nine or ten inches in length, by the Lippmann process, is contributed by Messrs Lumière. We do not know if this beautiful specimen of interferential photography has been shown in England; but, of the many examples of this class of colour work that we have seen, it struck us as the most remarkable. Solar and stellar photography, photogrammetry, and radiography are very largely illustrated in the French scientific section, and M. Henry Becquerel has a collection of prints showing the effects of the uranium and other radiations—the mysterious "radio-activity" which has recently occupied the attention of prominent French and English investigators.

It cannot be denied that in both the French and the English sections the higher scientific applications of photography are very fully illustrated—it would be difficult to name a branch of investigation which nowadays does not select the sensitive plate as its recording agent—and we have already recognised the outstanding excellence of the British pictorial section, organised by Mr. Craigie; but in most other respects photography as it is represented at Paris is a disappointment. The credit of British professional work is sustained by Messrs. Werner, Byrne, Downer, Lafayette, and a few other firms, but it is placed in the scientific section, and these photographers perhaps do not show the best examples of their powers. It suffices to mention in the apparatus section the names of Messrs. Watson, Messrs. Ross, Messrs. Dallmeyer, Messrs. Newman & Guardia, to give the reader an idea of what these firms' exhibits are—a detailed description of them would read like so many pages out of this JOURNAL and its ALMANAC.

But, were it ever so largely represented at Paris, photography, according to the system of classification or grouping adopted, would not make that appeal to the eye and the mind of the visitor which would have the effect of impressing one outside the sacred pale of cameradom with the beauty and variety of the achievement performed by the lens and the dry plate. Even in its most adequate manifestations photography is but a small thing in comparison with other divisions of human industry. It does not, to quote a familiar term, "bulk" so largely to the view as engineering, sculpture, painting, shipbuilding, and so forth. Undoubtedly, the organizers of the Paris Exposition missed a great chance in not availing themselves of this fact in an obvious manner. The work of Niepce and Daguerre is counted among the glories of France, and the invention of photography ranks very highly on the credit side of a century to which Paris is magnificently writing the word "Finis." What would have been more fitting, then, that photography should have had collective representation in a building specially set aside for the purpose at the Exposition? Two years ago, at Sydenham, British photography filled the naves of the Crystal Palace. We do not think we err in saying that, if the whole of the photographic exhibits at Paris were set out in the same space, there would be a very considerable amount of room to spare, so that a separate photographic pavilion on the Champ de Mars need not have been structurally vast. Unquestionably the Universal Exposition has yet to be held which shall at least attempt to do full justice to the world's photography. Elsewhere we make mention of the fact that at Glasgow next year an earnest effort will be put forth to improve upon past performances in this respect, and we trust that the example thus set will not be lost on the organizers of future exhibitions which appeal for universal support.

Reproductive processes at Paris rely almost entirely for illustration upon the well-known house of Braun & Co., which shows in carbon and photogravure copies of some of the world's pictorial masterpieces, including works which are conspicuous in our own National Gallery. There are one or two Italian contributors of photogravures; but, so far as we were able to perceive, no other country, save Great Britain, is represented by this branch of photography, although it is possible that there are examples in the Exposition which escaped our observation. A series of collotypes, of a very inferior commercial description, are placed in the French section; but they are hardly worth mentioning more specifically. Since the last Exposition was held in Paris, the revolution in book and periodical illustration then impending, thanks to photography, has become an accomplished fact, and the etched block produced from a negative has driven the work of the hand engraver out of the field. But of this wonderful change little or no sign is visible at Paris.

The amount of discussion relative to pictorial photography, its position and prospects, is very considerable; and, perhaps, is somewhat out of proportion to its absolute importance. Other divisions of photography might advantageously receive more notice than is given to them. Take, for example, reproductive photography, as demonstrated by Messrs. Braun. What a vast scope for admitted usefulness lies before it! The art treasures of the world are ready to hand for sympathetic reproduction in platinum, photogravure, and carbon; of this one phrase of photography alone a great collection might be made and shown to the public, which, in the main, is steeped in ignorance of the capabilities of photography in this important respect. If we except Messrs. Braun's work, Paris reveals to us nothing at all comparable, for instance, to the magnificent series of picture reproductions in platinum which our English Platinotype Company only too rarely show in public. These copies are in themselves perfect examples of monochrome work, judged by the standard to be kept in view when the qualities of a photograph are taken into consideration, and as satisfactory renderings of the originals in tone and texture could not be bettered.

It is apparent that comparatively few English people intend visiting the Paris Exposition, and consequently the photographic section of it will come under the notice of only a small number of photographers from this side of the Channel. If there be any who make a visit the opportunity of conscientiously studying the

comparatively little photography that is to be seen there, we should be surprised if the resultant feeling is not one of considerable disappointment. From our particular standpoint the Paris Exhibition is one of lost opportunities. In years to come, some great universal show may possibly be held in which the world's photographic workers will combine for the purpose of setting forth in no half-hearted manner a collective exposition which shall be worthy of photography. So far such a thing does not appear to have been contemplated by exhibition organizers.

ON THE NEW KACHIN DEVELOPER.

It is now more than a year since I made my first acquaintance with kachin. On its first introduction in the market I had the pleasure of contributing an article to the JOURNAL on this, the then latest new developing agent. In that article all I could say was in its favour, and now, after a more extensive experience with it, I can still speak in its praise. Just now Messrs. J. J. Griffin & Sons are introducing a new and improved kind of this developer, and a short time ago they were good enough to send me a sample for trial, and, if permitted, I should like to say a few words on its characteristics.

In appearance the new kachin does not differ much from the older kind, nor does it in solubility. It dissolves at once. With the older form caustic soda was necessary as the accelerator, and that is not a pleasant material to deal with. Again, the caustic soda in the developer produces an unpleasant softening of the skin of the fingers. Furthermore, it has a tendency, during hot weather, to soften the gelatine and so render the negatives tender to handle, and, with some plates, to cause frilling of the film. It is these inconveniences that have, I believe, mainly led the manufacturers to so modify the original kachin that it can be used with the carbonate, instead of the caustic alkali, while still retaining its old qualities. With the carbonate of soda the modified kachin is as energetic a developer as the original one was with the caustic soda. This would seem to show that the new agent is, *per se*, really a more powerful developing agent than the old one. Another advantage in the new material is that it can be used for developing Velox paper for colours, thus avoiding any after-toning, which the old kachin was not well adapted for.

Here is the formula recommended by the makers as a developer for plates and films, and I am pleased to see that Messrs. Griffin have given it under the metric system as well as the antiquated British one. It stands thus:—

KACHIN SODIUM CARBONATE.

A.

British System.	Metric System.
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Kachin .. (avoirdupois)	160 grains.	9 grammes.
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Sodium sulphite (crystal-		
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Sulphite	2½ ounces.	62·5 "
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Water (up to) (fluid)	20 "	500 c. c.
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B.

Sodium carbonate (crys-		
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Tallised	2 ounces.	50 grammes.
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Water (up to) (fluid)	20 "	500 c. c.
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For use take equal parts of A and B. More diluted developer gives softer results.

With this developer and a plate with normal exposure, I find the image appears in from half a minute to a minute, according to the temperature; in the tropical heat we had a fortnight ago the image came out in about thirty seconds. After the image appears, development proceeds steadily and uniformly until the desired density is obtained. A vigorous negative takes from four to six minutes. If the negative is under-exposed, a little longer time will be required. If the negative should be considerably under-exposed, some more of the accelerator "B" may be added to hasten the operation; but, except in extreme cases, a longer time in the solution will suffice, as, with this developer, density seems, so to speak, to wait for detail. In the case of much over-exposure, a five per cent. solution of ordinary borax is recommended as the restrainer, and I find it answers

admirably. However, the orthodox bromide may be used, and, personally, I am inclined to prefer it, but that perhaps is because I am a little conservative in my ideas—I am sometimes said to be so.

The negatives yielded by the new Kachin are of the same character as those by the old. They are free from staining of the film, and are of a rich, warm, black colour, which is not deceptive in the development, as is the case with some other developers which yield negatives that seem to have sufficient printing density when developed, but prove much too thin after they are fixed.

One most useful quality in Kachin is that its solution can be used over and over again. I have used the new kind after many plates have been developed in it, and then kept it three weeks and it still worked well. Necessarily the more plates that are developed in the same solution the slower it becomes in action through the accumulation of bromide from the films, though there is not very much difference unless a large number of plates have been developed in it. An old solution will be found an advantage in the case of much-over-exposed plates, as no restrainer is then necessary, and it tends to give vigour.

Kachin, whether the old or the new, does not in the least stain the fingers, neither has it any injurious action on the skin, as some developers have. In the little booklet, *How to Develop with Kachin*, issued by Messrs. Griffin, a formula corresponding with the above is given in ten per cent. solutions, which are preferred by some who like to know the proportion of each ingredient in grains per ounce they are working with. It is as under:—

KACHIN SODIUM CARBONATE.

(Using so-called Percentage Solutions.)

Ten per Cent. Kachin A.

Kachin	(avoirdupois) 1 ounce.
Sodium sulphite (crystallised) ..	1 "
Water (boiled or distilled) (up to)	(fluid) 9 ounces. 1 drachm.

Ten per Cent. B.

Sodium carbonate (crystallised) ..	
(avoirdupois)	1 ounce.
Water (boiled or distilled) (up to)	(fluid) 9 ounces. 1 drachm.

Ten per Cent. C.

Sodium Carbonate (crystallised) ..	
(avoirdupois)	1 ounce.
Water (boiled or distilled) (up to)	(fluid) 9 ounces. 1 drachm.

For a normal developer take—

A	80 minimis.
B	(fluid) 7 drachms. 20 minimis.
C	(fluid) 7 " 20 "

Each fluid ounce of the above contains—

Kachin	4 grains.
Sodium sulphate	26 "
Sodium carbonate	22 "

In the booklet a formula is also given for a caustic soda developer; but, as one of the special advantages of the new Kachin is that it can be used with the carbonate, I will not take up space by quoting it. I might here mention that the new Kachin, with the requisite carbonate, &c., is put up in glass tubes ("cartols"), and kept separated by a partition, six in a box for 2s. With these all one has to do is to empty the contents of one of them into 4 ounces of water, when we have a one-solution developer ready for use without further trouble. Or, if preferred, the two can be dissolved separately, each in 2 ounces of water, and we then get a two-solution developer without the trouble of having to weigh out the different ingredients. These "cartols" will, I am sure, be found a great convenience to amateurs, and they will also prove economical for the reason that amateurs often have to waste much of the sulphite of soda through it all going bad before it is all used up, and also that they cannot always replenish their stock when away from home.

One property of Kachin, both the old and the new, is that it can be employed to develop and fix the negative at the same time. The formula for that is as under:—

Stock Solution.

British System. Metric System.

Sodium sulphite (crystallised) (avoirdupois)	4 ounces.	30 grammes.
Caustic potash (purified in sticks)	408 grains.	7 "
Kachin	408 "	7 "

Water (up to)(fluid) 10 ounces. 75 c. c.

For fully exposed plates take—

Stock solution	(fluid) 6 drachms.
Hypo solution (1 ounce of hypo to 5 ounces of water)	10 "
Water	15 "

With this, and exposures approximately correct, I have got excellent negatives. But, as a professional photographer, I must confess I am no admirer of combining two distinct operations in one. I am no more in favour of combined developing and fixing than I am of combined toning and fixing. Still these systems do find favour with some amateurs—mainly, I surmise, as a matter of convenience.

The new Kachin, with carbonate, I find, is admirably suited for bromide paper. It yields fine warm blacks, and better than I have been able to get with other developers. Also with "platino-matt" paper, in my hands, it gives tones more closely resembling genuine platinotypes than does the formula supplied by the makers of the paper I experimented with. I may as well quote the formula I used.

A.

	British System.	Metric System.
Kachin	160 grains.	9 grammes.
Sodium sulphite (cryst.)	2½ ozs.	62·5 "
Water, up to	20 fl. ozs.	up to 500 c. c.

B.

Potassium carbonate ..	1¼ ozs.	31·25 grammes.
Potassium bromide ..	4 grains.	·23 "
Water, up to	20 fl. ozs.	up to 500 c. c.

Take equal parts of A and B.

Kachin does not lend itself to black tones with "Velox" and similar papers. But it is excellent for colours, without the necessity of after-toning. Here is the developer for this purpose:—

	British System.	Metric System.
Kachin	40 grains.	4·5 grammes.
Sodium sulphite (cryst.)	250 "	28·5 "
" carbonate ..	350 "	40·0 "
Potassium bromide ..	2 "	·23 "
Water, up to	10 fl. ozs.	up to 500 c. c.

With this developer and the "Carbon Velox" any colour from a dark chocolate brown, through the sepia, to a bright red chalk—even a fiery red—can be obtained at will, simply by modifying the exposure and the developer. The longer the exposure and the more the developer is diluted and restrained, the redder will be the colour. Used as given above, with the addition of five or six drops of a ten per cent. solution of bromide of potassium to the ounce, and an exposure to three inches of burning magnesium ribbon, six inches from a negative of average density, a good chocolate brown results. With the developer diluted with half its bulk of water, and fifteen to twenty drops of bromide solution, a warm sepia is obtained with an exposure to four inches of magnesium. With five inches of ribbon, and the developer diluted with an equal bulk of water, and restrained with fifty to sixty drops of bromide to the ounce, a dark red chalk is the result. If the developer is diluted with twice its bulk of water and still further restrained with a hundred or a hundred and twenty drops of the bromide, and six inches of ribbon used, a bright fiery red will be obtained. That is what I have found when employing what I call negatives of average density. "Average," however, is

by no means a fixed quantity when applied to negatives, for what some would call strong, others would term medium, or even thin.

In my experiments with Velox and Kachin I found that the tints could be considerably modified by the addition of a ten per cent. solution of citrate of soda, in the proportion of about double the quantity of the bromide employed. With this the tints partake more of a purple, and less of a yellow, tinge. Here is a hint I would give in working with Kachin for colours, namely, that in producing the redder tones the development should not be carried too far, as the pictures dry up much darker than they appear whilst wet.

The special purpose of Kachin, however, is not so much for paper as it is for plates and films, and for them I find, on comparison with other developers, that it is one of the best with which I am acquainted. I would therefore recommend my professional friends, who are still wedded to the "good old pyro," to give it a fair trial.

E. W. FOXLEE.

THE PHOTOGRAPHER'S YEAR.

AUGUST.

"THERE is no month in the year in which nature wears a more beautiful appearance than in the month of August. Spring has many beauties, and May is a fresh and blooming month, but the charms of this time of the year are enhanced by their contrast with the winter season. August has no such advantage. It comes when we remember nothing but clear skies, green fields, and sweet-smelling flowers—when the recollection of snow and ice and bleak winds has faded from our minds as completely as they have disappeared from the earth; and yet, what a pleasant time it is! Orchards and cornfields ring with the hum of labour; trees bend beneath the thick clusters of rich fruit, which bow their branches to the ground; and the corn, piled in graceful sheaves, or waving in every light breath that sweeps across it as if it wooed the sickle, tinges the landscape with a golden hue. A mellow softness appears to hang over the whole earth; the influence of the season appears to extend itself to the very waggon, whose slow motion across the well-reaped field is perceptible only to the eye, but strikes with no harsh sound upon the ear. As the coach rolls swiftly past the fields and orchards which skirt the road, groups of women and children, piling the fruit in sieves or gathering the scattered ears of corn, pause for an instant from their labour, and, shading the sunburnt face with a still browner hand, gaze upon the passengers with curious eyes. The reaper stops in his work, and stands with folded arms looking at the vehicle as it whirls past. . . . You cast a look behind you as you turn a corner of the road. The women and children have resumed their labour; the reaper once more stoops to his work; the cart-horses have moved on, and all are again in motion."

Such is the description of the month from the master-hand of Dickens. Individual observation in any suitable part of the country will verify it to-day as true and distinctive. Rural England never looks so full and rich as in August. If it be desired to embody such a pleasing feature as ample prosperity in a picture, this is the fitting opportunity. Speaking generally, no one with a fairly active liver will question that an immediately apparent pleasing idea is about the highest qualification that a picture can possess. If the tombstone mood be on, as it occasionally is with the best, let the camera at least be left at home. Instead, let there be as many as possible of Dickens's ingredients in the picture—sunshine, fruit-picking, corn sheaves, and exhilarating motion. The last item, and one which he ever loved to dwell upon, in coaching, has been evolved out of existence. As a point of vantage to observe from, the coach-top is no longer available—a most regrettable loss so far as the summer months are concerned. We are very ready to congratulate ourselves upon the great advances made during the last fifty years, particularly in the matter of newspapers and travelling. Whilst admitting gains, we have had to pay some penalty for the progress. There was more individuality, and harder thinking, when newspapers were fewer. The persistent drip of a halfpenny daily soon wears down solidity of character. Open, leisurely coaching, again, gave far better opportunity for drinking in fair country sights and scenes than railway travelling. The box seat of a coach in August must have been a true throne to one with a sympathetic feeling for nature. With all fitting respect for the padded comfort of a railway carriage, it could never rise to the top of a coach in fine weather. Luckily, something of a minor salvation has been worked out for us in the bicycle. It is the best existing means of coming into touch with the country, a fact proved by the marked increase of books dealing with the country since the bicycle has been brought to the point of being safely

and easily rideable. There is no necessity for entering into its many and various advantages; most readers will have found them out for themselves from experience. Amongst them much has been written of the facility with which it lends itself as an aid to the photographer.

Different views have been advanced as to the best form of camera to use, the best position upon the bicycle or its rider, upon which to carry it, and various little ingenious appliances invented to do the doing so with a minimum of jar and dust intrusion. In the abstract it looks very easy and practicable. Why is it that we see so few cameras on bicycles? And why so few good pictures when they have been carried? As a matter of fact, there is a bottom drawback acting independently of mechanical possibility, and even the inclination of the rider. The cycling mood is opposed to the photographic one. The natural tendency of the cyclist is to keep moving. The mind appears to become sympathetically sensitised by the physical motion, and takes to a ruling occupation of measuring things by distances, and the time in which those distances can be covered, comfortably or otherwise. One may determine, before starting on a run, that a part of its programme is to consist of admiring the view from a ridge, or smoking a pipe in the wayside shade. But, once comfortably a-wheel, the view is postponed from one gap or ridge-top to the one further on, and yet further on, with the ultimate result that it will not be looked at definitely at all.

Insensibly the important point becomes, How far is it to A? What prospect there is of getting into B in time for dinner or a bed? It is not stated, of course, that the necessary break cannot be managed at all, but the strongest tendencies pointed out. Most cyclists who do carry agreeable impressions of views will be ready to endorse the foregoing by noting, upon looking more closely back upon their pleasant memories, that they were gained not by following a predetermined plan, but during rests from weariness, for the absorption of "long" drinks, or for eating. There is, too, a general expansion of mind felt by the cyclist that is not of a piece with the cramped result given by the camera. The rapid motion, the thorough oxygenation of blood and tissue, and the closer contact with the open face of heaven and earth, account for it.

To do justice to his feelings he wants a camera that can take a panoramic view, a lens working at f-1 to give the necessary atmosphere, a shutter that will go off at the highest curve of an emotion, etherealised emulsions on his plate to record even suggestion of light and shade, and certainly an included something to register colour. But this, alas! is the kind of article given away to good and honest photographers in Elysian realms above: to ones, maybe, who when below did not cut prices for a dozen cabinets, who did no more retouching than they could help, and who possessed no competition medals. Even if it were available here, the necessary favourable condition for gaining full results would be so rare, and probably take its owner as unpreparedly as is the case with the less perfect instrument he has, that it would not be of much use. To cement the cyclo-photographic elements some solution with more clay and less ether in it is necessary. The practicable one must certainly take into chief consideration the ethical condition referred to, induced in the rider when his machine runs easily. It depends a good deal upon the proportions of cyclist and photographer in the worker. But one thing is certain, that the latter element will not have fair play, nor show high result, unless it be subject to something less erratic than passing fancy. The work should be to a plan. A series of photographs of English villages, for instance, would form a valuable possession; and English villages never look better, or more thriving, than they do in August. They would be agreeable mementoes of tours, and invaluable as factors in an intelligent, wide grasp of the face of England. The bicycle, and the bicycle only, can bring them within the reach of a moderately lined purse, and at the same time give the added measure of healthy and pleasant exercise. Once the plan had begun to get filled in, there is little fear that any mere moving impulse would send a man through a village that deserved notice without stopping.

Another plan of a very high order would be, trying to suggest the word-picture of a master, say that already referred to of Dickens, in a picture. Others of our classical writers, Scott, Ruskin, Blackmore, and Stevenson, have drawn pictures of the country, with the broad, simple touch characteristic of genius. The reader knows the spot, or such another, and, tribute to the touch of a master-hand, thinks he could describe it equally well himself. He soon finds out his mistake, if he takes upon himself to try, but with a sympathetic liking, and the faculty for selecting, the camera will help him out in getting a picture of it. In the case of the picture quoted, as a whole it is beyond the camera, but portions of it might be picked out and shown, fruit-gathering, corn-reaping, gleaning, the corn waggon, and so on. Many visits would have to be made—by the ready aid of the bicycle—many exposures made, an

probably many failures recorded before the desired result was got. But these are no peculiarities of photographic success; they are common to all best work in every direction. The great thing is the ultimate success. If even one such could be placed against each month, the worker may count himself lucky. Twelve in the year! Why, there are many workers of the very first order who cannot count as many real successes in as many years! The evolution of many things, from a piece of pottery to man himself, has been shown us with pen and pencil; it would be quite as interesting, as well as encouraging, to a conscientious and high-idealised photographer, inclined to be discouraged at the many difficulties in his path, if the full evolution of a really fine photographic picture, from the germ of the first suggestion to the framed success, were shown in the same way. There would be less of the happy accident about it than we are inclined to think, although possibly the highest praise that can be given to a picture, after all, is that it looks a happy accident.

But, let the plan be what it may, there is fine material of the best available in August, in its rich, mellow, sunshiny fulness. As a continuation month of the holiday one of July it also has its greater leisure, and from the fact of their being themselves more abroad in it, friends and critics will the more readily recognise the particular scenes and objects depicted, and, if good, be in a better position to appreciate and praise them.

DEBASED PHOTOGRAPHY.

We have received a copy of the speech on the evils of the streets of London, delivered by Mr. Samuel Smith, M.P., in the House of Commons on Friday, July 13. The Hon. Member made the following references to certain objectionable uses which are charged against photography: "Photography is far more employed than it used to be. It is much easier to produce cheap illustrations; and there are villains who scour the picture galleries of Europe to collect the worst garbage, and reproduce them in cheap forms for English circulation. One of these publishers offers twenty-four of such pictures for sixpence, and this is advertised in the cheap papers sold to boys and girls.

"Related to this trade in obscene pictures is the great abuse of animated pictures. This wonderful discovery can be utilised to give rational and innocent entertainment, and usually is, but it is also used by ruffians to debauch the young. In my constituency, last year, we discovered some 'penny-in-the-slot' machines which exhibited grossly indecent pictures to boys and girls, and I had many letters complaining of this plague from seaside resorts. Now I am told that many parts of London are plagued with it. I quote from a reliable observer:—

"I visited the Exhibition at Earl's Court on Friday, June 29. Many 'animated pictures,' 'mutoscopic views,' or 'moving pictures' are on view there in various parts of the grounds and buildings, all exhibited by means of 'penny-in-the-slot' machines. The first set of machines I visited were advertised to contain 'mutoscopic' views, and a number were labelled with suggestive titles. I put a penny in one machine, and found that it contained a series of pictures of girls in short frocks engaged in kicking at a hat which was held above their heads, there being at each attempt a liberal display of underclothing. In another machine of this set, labelled 'The Spider and the Fly,' views were exhibited showing a woman in tights sitting in the centre of an imitation spider's web, and inviting a young man to come to her. He resists at first, but in the last view rushes forward evidently to embrace her. There were many other views with suggestive titles. One which I saw was called 'Mixed Bathing Allowed,' and represented women in scanty bathing costumes playing on the beach.

"I visited another set of machines not labelled 'mutoscopic.' These pictures were the worst I have seen. One set was entitled 'Behind the Scenes of a Paris Theatre,' and consisted of thirteen pictures, which I saw. All of these pictures were objectionable, and many were indecent. One was a picture of a perfectly nude female; another represented a girl undressing in a bedroom; a third, a girl with nothing on but a thin under garment; and many were pictures of the lowest kind of French dancers in indecent and suggestive attitudes.

"I may add that the attendants at many of these machines are girls.

"Scoundrels take an empty shop in a populous thoroughfare and fit up their machines with such pictures, putting suggestive headings in the windows, and a crowd of children are enticed within, and gradually brutalised by the disgusting sights they witness. In a primitive state of society these men would be lynched, but here they are allowed to do as they like."

There is no doubt that photography, ever since it became a practicable portrait process, has suffered from the improper uses that have been made

of it; and the honourable member from whose speech we are quoting b no means indicates, as every man of the world perfectly well knows, th worst features of this unpleasant traffic. The examples cited in the abo speech are, perhaps, less objectionable than they are made to appear in the printed report of an impassioned harangue; but, independently c this aspect of matters, the member for Flintshire may rest assured tha the many thousands of right-minded photographers in this country wil view with disfavour any attempt to utilise their favourite art inimically to public morals.

FOREIGN NEWS AND NOTES.

Photo-Niello.—Herr Gaedicke, the editor of the *Photographisches Wochenblatt*, has patented a process of imitation Niello-work, in which photography plays an important part. Niello was practised in the fifteenth century by Italian silversmiths for the decoration of small articles. A design was deeply engraved in line upon a plate of silver, and filled with a mixture of sulphide of silver, copper, and lead, and exposed to heat. The lines and surface are thus covered with a black substance resembling silver in regard to flexibility and capacity for polish, and, by grinding until the silver groundwork of the design is again exposed, some very beautiful decorative effects are obtained. Herr Gaedicke transfers a suitable process print to silver, etches it, and fills it in with Niello. Some small difficulties have to be surmounted in the etching, as silver must be treated differently from zinc or copper; but the real difficulties are connected with the application of the Niello. The dots forming the image are so fine and close together that the old process is useless, the Niello being too coarse. Herr Gaedicke, therefore, makes his Niello by precipitation from a mixed solution of copper, silver, and lead salts, and the powder thus obtained is so fine that, with a little practice, the image can be properly filled in and then fixed in a muffle furnace. The process may have to be repeated two or three times until the entire surface is covered. The plate should then be ground successively on fine sandstone, wood ash, and finest emery, until the image is perfect, and has the appearance of a very fine process print.

A New Company.—We learn from the *Deutsche Photographen Zeitung* that a new company has been formed in Germany for the manufacture of photographic apparatus and kindred appliances, with the exception of optical instruments in the more restricted sense, and for the sale of all kinds of photographic requisites. The Company is called the "Actien Gesellschaft Camerawerk Palmos," and has a capital of 150,000 marks. The Company takes over the assets and business of the firms Karl Bernhard Kurt Bentzin, cabinet-maker, and Karl Bentzin, photographic apparatus manufacturer, of Görlitz, by purchase, for the sum of 100,000 marks. The managers are Hugo Oscar Ludwig Bräntigam, merchant, of Görlitz, and Karl Bernhard Kurt Bentzin, cabinet-maker, of Görlitz. The founders of the Company are Dr. Paul Rudolph, mathematician; Karl Gustav Hermann Richard Schüttauf, mathematician; Karl Friedrich Oswald Näther, foreman; Karl Friedrich Hyronimus (alias Fritz Müller), foreman; August Bruno Klemm, foreman, all of Jena, who have subscribed the capital. Emil Mehlhorn, barrister and notary, of Kahla; Gotthilf Heinrich Franz Schmidt, merchant, of Snalfeld; and Karl August Kellner, merchant, of Kahla, have been elected members of the first Board of Directors.

Reduction and Reversal with Permanganate of Potash.—It will be remembered that, shortly after the persulphate of ammonium reducer was introduced by Messrs. Lumière, Professor Namias drew attention to the use of permanganate of potash for the same purpose. The *Photographisches Centralblatt* republishes the formula given by Professor Namias, and recommends permanganate instead of persulphate, as it is a salt which may be obtained anywhere of sufficient purity, whereas persulphate varies considerably in quality. Namias gave the following formula in the *Bulletin de la Société Française* for December 15, 1899:—

Permanganate of potash	$\frac{1}{2}$ gramme.
Strongest sulphuric acid	1 c.c.
Water.....	1000 ,

Like persulphate, this reducer attacks the densest parts of the negative first, and it is of great value in the treatment of hard negatives. Moreover, the negative does not need prolonged washing for removal of the hypo, as the permanganate oxidises any trace which may remain in the film. The brownish tone, which sometimes remains after treatment with permanganate, may be removed by immersing the plate in a one-half to one per cent. solution of oxalic acid to remove residual traces of manganese peroxide. Permanganate may also be used for making direct positives in the camera. A slow plate should be used, and full exposure given. Develop with hydroquinone, using at least seven grammes of bromide of potash per litre of developer. A very strong image should be aimed for, regardless of fog. After development the plate should be immersed in a permanganate bath of double the strength given above. The image will soon disappear, and, if a brownish stain should remain, treat with oxalic acid as recommended. The positive should then be developed in daylight with—

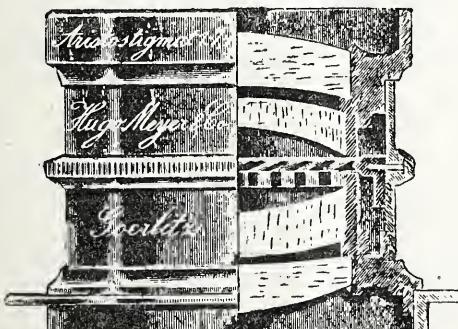
Metol	10 grammes.
Anhydrous sulphite of soda.....	20 "
Caustic potash	10 "
Water	1000 c.c.

An image of fine black tone is obtained. If the gelatine should show too much tendency to frill, add a little formalin to the developer.

THE ARISTOSTIGMAT—A NEW LENS.

ACCORDING to the *Deutsche Photographen Zeitung*, the firm of Hugo Meyer & Co., of Görlitz, have introduced a new lens which is shown in the accompanying figure; and, as will be seen, it consists of two unsymmetrical and uncemented combinations, each consisting of an outer convergent lens and an inner divergent lens. It is somewhat similar in type to the Planar and Unar, of Zeiss. This lens is said to work at an aperture of f-7·7, and from the tests of Herr Schwier, its effective aperture was f-7·85. When focussing the same size, the chemical focus was 1·5 mm. within the visual; when the image was $\frac{1}{2}$ of the original, it was 0·9 to 1·2 mm.; when focussed on infinity, there was no difference. The lens is quite free from focal difference with the diaphragms.

The field of illumination is about 110°, and the greater part of this could be used practically when stopped down, as the lens is so astigmatically corrected, that at an angle of 39° to the axis an almost



complete sharpness is attained in the picture plane. The following variations were found; at 10° from the axis 0·7 mm., at 15° 1·6 mm., at 20° 2·1 mm., at 25° 3·2 mm., then the error quickly sank again, till at 39° it was flat. The curves for the meridional oblique rays are so close to one another, that sufficient sharpness for the two may be simultaneously obtained on one plane, and the flatness of field is such that, with a group of 2½ m. breadth, the greatest sharpness in the middle is only 20 cm. behind the other sides.

With a lens of 24 cm. (advertised) 24·35 actual, a plate 18×24 cm. is covered sharply with full aperture, and 24×30 cm. is covered with smaller stop, if, as is generally the case in practice, absolute sharpness is not required in the extreme corners. A plate 13×18 cm. is covered absolutely sharp at full aperture.

Distortion was not detected either with the complete lens, or with the back lens alone, which covered a plate 13×18 at f-30. Flare was not detected in spite of the number of reflecting surfaces.

MEASUREMENT OF PHOTOGRAPHIC INTENSITIES.

[Reprinted from *Popular Astronomy*.]

The object of this investigation is to determine the photographic intensity of various sources of light upon a uniform scale. This scale will be that of the Meridian Photometer, in which α Ursæ Minoris has the magnitude of 2·15, and one unit corresponds to the ratio of 2·518, whose logarithm is 0·400. Luminous points may be compared directly with stars. In the case of surfaces, the light emitted by a circle having a diameter of one minute of arc is employed. In general, different portions of the same photographic plate are exposed for a given time to the sources of light to be compared, and the darkening measured with a photographic wedge.

Observations of surfaces will include intensity of the sky at different distances from the sun; the sky in the zenith during twilight, on clear and cloudy days, on dark and moonlight nights; comparisons of blue sky with cumulus cloud; intensity of Milky Way, Aurora, and Zodiacal Light. For this purpose pinhole cameras are used with various apertures. For very faint lights, apertures subtending an angle of sixty degrees or more are used. When possible, automatic devices are employed, both to make the exposure and to shift the plate.

For measuring luminous points, the light concentrated by a lens illuminates the plate placed at various distances from the focus. In this manner, bright stars, the planets, and the Moon at different phases and latitudes may be compared with α Ursæ Minoris or an artificial light placed at a distance. It is also necessary to determine the effect of any slight fogging before, after, or during the principal exposure. The total and local absorption of the lens will also be measured. The same objects are also compared directly by pinhole cameras. In using a pinhole camera to measure points differing greatly in brightness, the duration of the exposure must be varied. This necessitates a study of the darkening of the plate with relation to time. The comparison is made, in all cases, with a light, producing an equal darkening in the same time. Another factor may be introduced by inclining the plate. An angle of sixty degrees is equal to a diminution of one-half, or about three-quarters of a magnitude. The exact amount corresponding to the inclination used must be determined by experiment.

The determination of the light of the sun is a difficult problem. The light may be reduced by a distant lens of short focus, and compared with the standard light similarly reduced, but at less distance. Another way is by a combination of lenses like a telescope, which enlarges or reduces objects as we look through one end or the other. The absorption of the instrument is thus eliminated. Two plates of glass, placed so as to give multiple reflections, will also afford a wide range of exposure, as well as a means of comparing lights of great difference in intensity. Pinhole cameras having the aperture covered with a porcelain plate can be constructed so as to give a range of fifteen to twenty magnitudes, which is sufficient for comparing the sun and the moon. A second pinhole camera placed in front will cut off the light of the sky from the aperture. The absorption and the diffusing power of the porcelain plate must be measured independently. In all the preceding plans the sensitiveness of the plates to different colours affects the results. By combining a slit-spectrograph with the cameras just described, a comparison of the light of the sun and the moon may be made in different parts of the spectrum corresponding to given wave-lengths.

The comparison of the spectrum of the various sources of light possesses many advantages. The work is placed on such a basis that the results are freed from the troublesome questions of absorption, sensitiveness of the plate, &c., and are rendered directly comparable with those that may be obtained at different times, by other observers, under widely differing circumstances. In fact, the results should be the same as those obtained by the eye, the bolometer, or in any other manner that may be devised. All these measures may be made either with a telescope and objective prism, or with a slit spectrograph combined with a pinhole camera or telescope. With the objective prism the spectra are made of the same width, either by interposing a cylindrical lens, by moving the plate at the same equable rate for each exposure, or by throwing the image out of focus. In the latter case a rectangular aperture should be placed over the prism, so as to give width with a minimum loss of definition. With the moving plate a variation of light is obtained by covering one-half of the prism at a time, along a line perpendicular to its edge.

The standard light used is an ordinary Argand gas burner shining through a small hole. The star α Ursæ Minoris is made the ultimate standard to which all work is referred, since the standard light is compared with it before and after each monthly test of the plates. In addition to the wedges for measuring the density of photographic plates a polarising photometer is used for comparing surfaces with each other.

Early in 1900, while this work was in progress, Mr. W. H. Pickering, in preparing to observe the Solar Eclipse of May 28, desired to select a suitable plate and developer for the work, and accordingly undertook the following investigation, which he describes below:—

A suitable standard of light has long been wanted in photography. Artificial sources usually give even more uncertain results photographically than they do visually, because a slight variation in temperature will affect the blue end of the spectrum even more than the red end. In 1893 it occurred to the writer to employ as a primary standard of actinic intensity the radiation of a star shining directly upon the photographic plate without previously passing through or being reflected from any medium except our atmosphere. Since this standard is too faint for general use, a secondary one to be standardised from it has been devised. The light from the star is condensed through a simple plano-convex lens of 8.2 cm. aperture and short focus, and is focussed on a small circle of ground glass 0.5 cm. in diameter. This is placed 3 cm. in front of the sensitive plate, which is exposed to it through a small square aperture measuring 0.2 cm. on a side, cut in a blackened brass plate. The constant of this instrument was determined, and it was found to give about thirty times the light of the direct radiation of a star upon the photographic plate. With twenty minutes exposure a Ursæ Minoris darkened the plate sufficiently to produce the "Sensitive Tint," that is to say the tint where a small variation in the light is most noticeable. The secondary standard, however, is not sufficiently brilliant for ordinary purposes, and a tertiary one has therefore been devised. This consists of a box 30 cm. in length, one end of which contains an aperture 5 cm. in diameter, covered by a piece of ground glass, and the other end carries the sensitive plate and the blackened brass plate described above. Just inside the ground glass may be placed diaphragms ranging from 0.04 to 4.0 cm. in diameter. At a distance of about 200 cm. beyond the ground glass is placed an Argand gas burner. This apparatus gives ample light for all photographic purposes, and the plates exposed in it may always be standardised when necessary by an additional exposure to the secondary standard.

The three pieces of apparatus above described are adapted to various investigations. Thus the photographic brightness of the moon, and of the brighter stars and planets, may be measured with accuracy by employing different apertures in front of the lens of the secondary standard, and measuring the brightness of the various images obtained by means of a photographic wedge, or a series of standard squares of varying density. It is very important to vary the aperture rather than the time of exposure, since the results obtained in the latter case would have to be corrected by the "time correction." The secondary standard also enables us to express the sensitiveness of a plate in terms of universal application throughout all time. Thus the Seed plate No. 27 is capable of being appreciably darkened when exposed for ten minutes to a source equal to 300 times the brightness of a Ursæ Minoris. This amount of light is equal to about thirty times the brightness of a star whose photographic magnitude is 0.0. The logarithm of this number, 1.5, may be conveniently used to represent the sensitiveness of the Seed plate. By the use of the secondary and tertiary standard, together with an ordinary photographic telescope, we may make a study of the brightness of nebulae, comets, and other luminous surfaces.

From these various investigations it is hoped that we shall obtain a scale of photographic intensities with which all sources of light may be compared and to which they may be referred.

PROFESSOR EDWARD C. PICKERING.

Harvard College Observatory.

ANALYTICAL PORTRAITURE

[Reprinted from *Nature*.]

It seems well to put on record the principal results of experiments that I have recently made to *isolate the particulars* in which one portrait differs from another. They had a measure of success, but not enough to deserve illustration or lengthy description. The objects I had hoped to attain are important; namely, to define photographically the direction and degrees in which any individual differs from the race to which he belongs, the race being represented by a composite picture of many individuals belonging to it. Or, again, to define the particulars in which any variety of a plant or animal differs from its parent species. Or to define family features; or to isolate expressions, recollecting that these consist both of subtractions from, and additions to, the features as seen in repose.

My starting point was that the exact superimposition of a rather faint

positive upon its rather faint negative produces an approximately uniform grey when they are viewed as a single transparency. Thus, I photographed a rotating disc that had been faced with white paper and divided into concentric rings. The innermost disc was left white, the outermost ring was painted black, and the intermediate rings contained successively increasing proportions of black to white. The photographic negative showed rings of graded tints, and from this I took a positive by contact. Subsequently applying the positive to the negative, film to film, and viewing them as a transparency, a nearly uniform grey surface was produced. It was necessary to superimpose them with exactness; otherwise the edges of the rings were conspicuously dark in one part, and light in the opposite part. Another test experiment was to paste together thicknesses of tracing paper—two-fold, three-fold, &c., up to twelve-fold—to cut distinctively shaped snippets of these, and to variously distribute them over the surface of a glass plate, which was then photographed, and a positive taken as well. On treating the positive and negative as above, all the tints between those of the three-fold and the nine-fold inclusive produced a uniform grey.

Let A and B be any two pictures, whose respective negatives and positives will be called neg. a, pos. a, neg. b, pos. b. My object was to produce photographically a third picture, X, which should express the difference between A and B, that is, should be equal to A-B, or else a fourth picture, Y, which should represent B-A.

It will, however, be simpler to treat the problem at first as an optical one, based on the following equations:—

$$(I.) \text{pos. } a + \text{neg. } a = \text{grey}; \quad (II.) \text{pos. } a + x = \text{pos. } b$$

(if treated as a photographic problem, (II.) would be replaced by pos. a+x=neg. b). From these we obtain

$$(III.) \text{pos. } a + \{\text{pos. } b + \text{neg. } a\} = \text{pos. } b + \text{grey},$$

and

$$(IV.) \text{pos. } b + \{\text{pos. } a + \text{neg. } b\} = \text{pos. } a + \text{grey}.$$

Calling the terms within brackets by the name of "transformers," the transformer of b into a is the negative of the transformer of a into b. The two terms within brackets may be "composed" together on equal terms, then the result may be composed with the first term, allowing two-thirds of the total time of exposure to the transformer, and one-third to the first term; or, what comes to the same thing in the end, all three terms may be composed in equal shares, allowing one-third of the total time of exposure to each. The transformers in (III.) and (IV.) being respectively $x + \text{grey}$ and $y + \text{grey}$, are nearly equivalent for the purposes of the inquiry to x and y , because the addition of a uniform shade of grey has little or no effect on pictorial resemblance. A portrait does not cease to resemble the original when it has become somewhat browned by exposure to a London atmosphere, or when it is viewed in shade or under a tinted glass. Its distinctiveness depends on the differences (not the ratios) being preserved between the tints of all adjacent elements of its surface. Of course the grey must not be too dark, otherwise the deeper tints of the portrait would appear indistinguishably black.

This method of transformation succeeds fairly well. I changed an F on a white ground into a good G on a grey ground, and I changed, with passable success, one portrait A on white ground into another portrait B on grey ground, but the transformer itself gave little of that information to the eye which I had expected. It must have nearly isolated, but it failed to exhibit in an intelligible form the differences between A and B. Then I photographed two faces, each in two expressions, the one glum and the other smiling broadly. I could turn the glum face into the smiling one, or vice versa, by means of the suitable transformer; but the transformers themselves were ghastly to look at, and did not at all give the impression of a detached smile or of a detached glumness.

Part of the ghastliness was due to the different densities of the superimposed positives and negatives, which did not neatly obliterate one another in the unchanged portions of the face, and part was due to their not being superimposed in the best possible way. There can be no doubt of the best fit when engaged in making the transformer of an I into an L; but the eye must determine the best fit and proportions of the two components of the transformer of one portrait into another. I cannot yet make up my mind whether or no the process admits of substantial improvement, but feel sure that the only satisfactory experiments now would be those made by two converging lanterns on a screen, one at least of which admits of easy and delicate adjustment in direction and in the intensity of its illumination. The most suitable portraits for the attempt are apparently such as are popularly, and sometimes reproachfully, termed "artistic," that is to say, with blurred outlines and medium tints; certainly not those which in photographic language are called "plucky." I have no means in my house for experiments of this kind,

out perhaps a trial might be made in some laboratory where they exist. The point is to ascertain whether the images of neg. a and pos. b can be so combined on the screen so as to give an intelligible and useful idea of the differences between A and B.

FRANCIS GALTON.

THE THREE-COLOUR PROCESS IN THE REPRODUCTION OF PAINTINGS.

Not for the first time do we find the art critic of the *Daily Chronicle*, whose style of writing betrays his identity, publishing his views on the unsuitability of the three-colour process as a reproductive medium where oil or water colour is concerned. Of a three-colour frontispiece to the *July Studio* he remarks: "The print is signed by Angerer & Goeschl, and for mechanical reproduction of subtle, artistic colour—the mere name brands the process—this firm is as good as, if not better than, any other in the world. But," he proceeds, "the important part of the whole matter is just this: As has been pointed out again and again, pictures cannot be reproduced by the three-colour process or any other superimposed method. This month there are innumerable proofs that the feat may be accomplished—after a fashion. Almost every magazine, certainly almost every American magazine, contains colour prints, and all are vile, simply because the artists, instead of working for colour reproduction, have made pictures without any reference whatever to the reproducer. It is impossible, and it always will be impossible, to reproduce a water colour in printer's ink with any degree of satisfaction. It is absolutely absurd to attempt to reproduce an oil painting in printer's ink by the three primary colours when not a single one of them was used by the artist in doing his work. It is perfectly easy, however, for the artist to make a drawing in colour especially for reproduction, to have this reproduced, and then for the artist alone, not the printer or photogravurist, to mix up in printer's ink the colours he wishes it to be printed with, and the result will be at once obtained. This, however, would eliminate the three-colour person and the fine-art printer, who are making our magazines and books the despair of artists. Reproductions in colour are always out of place in a well-printed book. Simple decorations may be, at times, used; but the attempt to print mechanically reproduced versions of oil paintings and water colours on shining art papers is an abomination, and in the cheaper publications a supreme expression of vulgarity." The unsatisfactory nature of most three-colour reproductions of water colours being provisionally granted, is not the writer a little rash in pinning his faith to the impossibility of successfully imitating colour by heliochromy? The passage we have italicised appears to indicate that, if he possessed a less elementary acquaintance with the scientific side of his subject, he would not be so sceptical of the feasibility of the correct reproduction of it by means of photography. The provision of suitable inks for three-colour work is a matter that has engaged very considerable attention.

IMPROVEMENTS IN APPARATUS FOR PROJECTING IMAGES OF OPAQUE PICTURES AND OTHER OBJECTS UPON SCREENS.

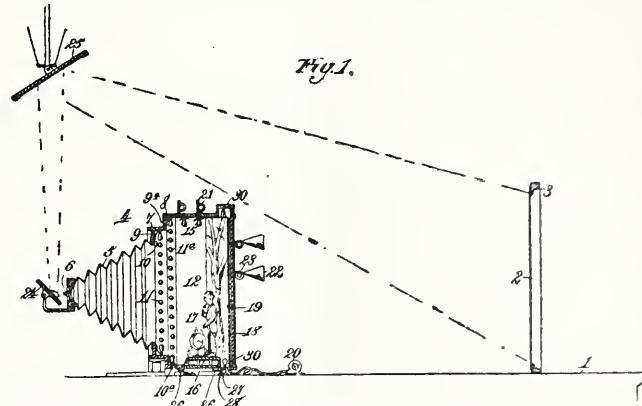
[Fulgora's Patent No. 8891 of 1900.]

THE patentee says: "I mount upon the stage 1, preferably near the front thereof, a translucent screen 2 having an ornamental frame 3 surrounding the same. At the rear of the screen 2 the projecting apparatus 4 is located, the same consisting of an opaque tapering bellows 5 having a lens 6 at the apex thereof and an annular frame 7 at the rear thereof. The said frame is provided with a rearwardly extending flange 8 and an inwardly extending flange 9, between which is an offset 9^a, forming two annular pockets or recesses 10 and 10^a in which are located two continuous series of incandescent lamps 11 and 11^a. As these lamps are located respectively behind the flange 9 and the offset 9^a, the direct rays of light therefrom are prevented from being projected against the lens 6. Behind the bellows 5, but in close contact with the frame 7, is a car or casing 12, having all sides closed, except its front. The top, bottom, and sides are substantially in line with the flange 8 of the frame 7, and are adapted to form a light-tight joint therewith. In the cap or casing 12, rows of incandescent lamps, 15, 15, are located, the said lamps being so disposed that the direct rays thereof will be cut off from the lens 6 by the flange 9. When the car or casing 12 is in operative position, in close contact with and joined to the flange 8 of the frame 7, there is formed by the bellows 5 and the car 12 a closed chamber having opaque walls through which no light can enter or escape. At the bottom of the car or casing 12, I preferably form a platform 16 on which the living figures 17 stand, in the position they are to assume for the representation of the picture to be produced. Back of these figures and against the rear wall

18 of the car 12, suitable scenery is placed. For the purpose of providing for the change of scenery the rear wall 18 is made movable. This, however, is not essential, as the scenery may be placed in position in other ways.

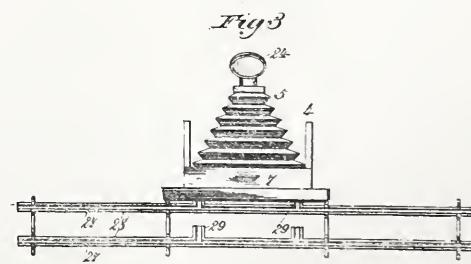
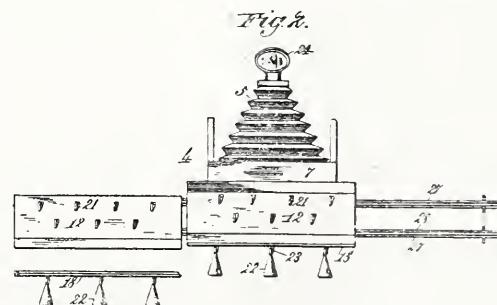
"In order to provide for the ventilation of the box or car 12, which the living objects occupy, I provide a ventilating fan 20 and pipes 21, the latter communicating with the outside of the car or casing and being crooked for the purpose of preventing the escape of light from within, or the entrance of light from without. In the rear wall 18 of the car or casing 12 I also provide megaphones 22, having crooked stems 23 for the transmission of sound from the inside of the car to the outside.

"In front of the lens 6 is an adjustable reflecting mirror 24 and above the mirror 24 is a second adjustable mirror 25, these two mirrors being



designed for the purpose of reflecting the image of the living objects within the car or casing 12 upon the rear side of the translucent screen 2. It will be obvious, however, that both of the mirrors 24 and 25 may be dispensed with and the image transmitted direct upon the rear side of the screen 2. To do this, however, the position of the projecting apparatus 4 would have to be reversed.

"It will be understood from the foregoing that the electric lamps 11 and 15 illuminate the living objects 17 within the car or casing 12, and that the rays of light from said living objects are collected by the lens 6 and transmitted upon the screen 2. All movements of these objects as well as the colours thereof, will also be transmitted, with the result that



the living picture, represented by the objects 17, is accurately transmitted and reproduced within view of the audience in front of the stage 1.

"It will be understood, of course, that a number of cars or casings 12 are employed by means of which the picture to be produced may be readily and quickly changed. These cars are provided on their under side with ball rollers 26, which fit within the grooves 27 of the rails 28, extending across the stage 1 and secured thereto. These rails 28 are provided with lateral extensions or branches 29, 29, just back of the projecting apparatus 4, so that a car may be moved from behind the scenes on the stage along the rails 28 until the branches 29 are reached, and then thrown forwardly until the sides of the car connect with the flange 8 of the frame 7 at the rear of the bellows 5. When it is desired to change from one picture to the other, the lamps 11 and 15 are

extinguished, and while the stage is still in darkness the car 12, containing the figure representing the picture which has just been produced, is drawn rearwardly on the branch rails 29 and moved off the stage, say to the right, along the main track rails 28. At the same time the car containing the figures of the picture which is to be produced next is moved from the left-hand end of the track rails 28 to the branch rails 29, and then brought forwardly until contact or close engagement is had between said car and the frame 7. The lamps 11 and 15 are then turned on and the apparatus acts as before. In addition to the pockets 10 and 10^a in the annular frame 7 for the reception of incandescent electric lamps 11 and 11^a I form at the rear of the car or easing 12 a pocket or pockets 30, in which a supplemental row of incandescent electric lamps are placed. The front walls of these pockets cut off the direct rays of light from the lamps from the lens 6."

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY'S IRISH TOUR.

We are indebted to the President of the South London Society, Mr. Charles H. Oakden, for the following notes of a recent photographic tour in Ireland carried out by his energetic and ubiquitous society:—

July 20 saw the South Londoners, under the leadership of Mr. Howard Esler, off to Ireland on their annual excursion. They travelled *via* Holyhead and Greenore to Enniskillen, where they put up at the Royal Hotel. The same morning the steamer *Knocknanny* was taken for a trip of twenty-two miles to Castle Caldwell. On the way it was noted that the scenery of Loch Erne changed entirely three times during the journey. The first stage of the journey, reedy shores being very characteristic; the next stage the islands being luxuriantly covered with foliage, while in the third stage the scenery was of a more open character, at one point a mountain coming down to the edge of the lake. Castle Caldwell was found to consist practically of a railway station and constabulary barracks, next to which was a fiddler's tombstone. A few yards distant were two or three cottages, and on an opposite side of an arm of the lake the ruins of Castle Caldwell were found.

Next morning row boats were taken, and the ruins of the abbey, old church, St. Molaise's house, the round tower and high cross were photographed, and many pictures of cattle cooling themselves in the waters on the lake shores obtained. Other islands were visited, and on the return journey pictures of Enniskillen from the river were taken. Next morning, by special conveyance, the excursionists travelled *via* Florence Court to the Glen of the Claddagh, at the head of which is the Marble Arch in the side of a limestone hill from which the river emerges. The scenery of the glen partakes of the character of the Dargle and also of the Devil's Glen in Wicklow. Some of the excursionists visited the caves on the other side of the mountain through which the river flowed. This river they had to cross by means of stepping stones. Leaving the Marble Arch, the Black Lion Fair, two miles distant, was found in full swing, and here the hand-camera men took full advantage of their chance. The return was made *via* Bellecoo and the north shore of Loch Macnean, and many fine views were noted. After dinner the train was taken for Sligo, where the headquarters were at the Imperial. After spending some time among the ruins of Sligo Abbey, a special conveyance was taken for a drive of twenty miles round the base of Knocknarea. On the way stoppages were made at Carromore to visit the Cromlechs, the shore opposite Glen Lodge overlooking Ballysodare Bay, Cullenmore, Strandhill, Scarden Holy Wells, Gibraltar Point, and Cummeen Strand. On this day the whole of the plates and films taken out were exposed, and the wish for more expressed, the skies throughout the latter part of the day being exceedingly fine.

Next morning row boats were taken down the river Garvogue. At the point where it enters Lock Gill, Tober'n'alt, one of the Pilgrim's Holy Wells, was visited. It was found under the shadow of overhanging trees, and close by an altar had been erected upon which the pilgrims left their offerings. The boats parted company, each visiting a different part of the lake, which is often referred to as the "Killarney of the West."

Next morning a drive was taken to Glencar Loch and Fall where many exposures were made. The return journey was made, *via* Drumcliffe-of-the-Crosses where a fine cross and the remains of a round tower were found. Many stoppages were made, both on the outward and return journey. Before breakfast the next morning, some of the excursionists visited Ballysodare, where the cascades, the ruined church, and the village were photographed. After breakfast, steamer was taken to the Rosses, seven miles distant, and on the return a conveyance met the excursionists to take them to Primrose Grange. The Glen of Knocknarea here consists of a fissure in the limestone rocks, varying from twenty to thirty feet in width, and three-quarters of a mile in length. At the entrance, the meadow-sweet grew in great profusion up to six feet in height, scenting the air around. In the Glen itself the ground was literally carpeted with ferns, partially overshadowed by trees. The stereoscopic workers were in clover, and well they appreciated it. Some of the younger members of the party climbed the mountain from Primrose Grange, and they considered themselves amply repaid by the view they obtained from the cairn, the

burial-place of Queen Mab in the first century. The view included the shores of Donegal, Sligo, and part of Connemara, the Ben Bulbin range of mountains, Loch Gill with Sligo mapped out at its end, Ballysodare and the adjoining mountains, while in a south-easterly direction the view extended over the great central plain of Ireland. The next morning the excursionists returned to Enniskillen, where four hours were spent in and about the town, some taking advantage of the time in taking a flying visit to Lisbellaw. After a substantial dinner, the return journey was commenced, the excursionists arriving at Euston at 7 a.m.

Our Editorial Table.

CATALOGUE RECEIVED.

George Houghton & Sons, 88 & 89, High Holborn, W.C.

A STRONGLY bound volume of 744 pages forms the latest catalogue of Messrs. Houghton. It exceeds the 1899 issue by more than 100 pages. Special attention is drawn to the fact that over 50 varieties of hand cameras are quoted, illustrated, and described in the book. There are many special bromide and half-tone pictures. We may remind our professional readers that a 32 page section deals with backgrounds and studio accessories, which are here shown and beautifully illustrated in great variety. The catalogue is a valuable guide to every photographer with money to spend on his hobby or business.

LUMIÈRE'S NEW PORCELAINE PAPER.

MESSRS. L. GAUMONT & Co., of 25, Cecil-court, Charing Cross-road, London, W.C., are issuing a developing bromide paper manufactured by Messrs. Lumière, of Lyons. It is called the new Porcelaine paper. A perfect matt surface, pure whites, rich blacks, and excellence of gradation are amongst the distinctive features claimed for the paper, which is said to yield prints in which the finest details are preserved. The paper is manipulated in the ordinary way, but a few special instructions are given. These we quote: In opening the papers one must be careful not to rub the sheets, as any friction on the surface will show black in the whites of the print. Marks can, however, be easily removed by rubbing them well with a soft leather soaked in alcohol. The exposure should be long enough to enable the print to be developed in thirty to forty seconds in order to ensure pure whites. In the case of prints with white margins, it is well to rub the whites lightly with a piece of wet cotton-wool. This can be done in the last washing. Proofs not intended to be mounted can be immersed for about ten minutes in a water containing five per cent of glycerine. This prevents the paper from curling.

In reference to their acid hypo fixing bath, Messrs. J. J. Griffin & Sons, of 20-26, Sardinia-street, Lincoln's Inn-fields, W.C., write to point out that it has hitherto been sold by them packed in wooden boxes, but that they have now improved upon this method of packing by providing an airtight tin, so that the contents are well preserved from the effects of air or



damp. Messrs. Griffin add: "We have also increased the quantity, so that twenty ounces of solution for paper, or ten ounces for plates, may be made up. This bath, in its more concentrated form, will fix some hundreds of prints before being exhausted, and it is more rapid in its action. The price remains the same, i.e., 6d. per tin."

"ARGO" PAPER—AND A NEW ROLLABLE FILM.

THE Columbia Optical and Camera Company of 42, Goswell-road, London, E.C., the London agents for the Defender Photo Supply Company of Rochester, N.Y., are issuing a new gaslight developing paper, the "Argo," manufactured by the latter Company. A sample print lies before us, and, if it be taken as an average specimen of the results yielded by Argo paper, then we have no hesitation in pronouncing the latter a most excellent printing medium, the image from the deepest shadows to the highest lights being perfectly rendered. A better specimen

of bromide work could not be desired. The circular of instructions states that Argo is a new quick-printing development process paper combining the "chemical effects of platinum, or carbon," and rapid printing qualities of bromide papers, with simplicity in manipulation. But the word "chemical" in our quotation is, of course, a *façon de parler*, neither pigmentary carbon nor platinum entering into the composition of the image, which is metallic silver.

The "Tenet" is the name of a new rollable celluloid film that is being introduced by the Columbia Company. It is claimed to be exceedingly rapid, and it is, moreover, stated that, if stored with ordinary care, the film will keep for years in any ordinary climate. The Columbia Company draw special attention to the stout material which they use, allowing the film to be developed almost in the same way as an ordinary plate, and with any developer. The stout material also prevents the tearing of the film, and is of great advantage in printing out, as it lies flat almost like a plate. The Tenet film is made in all sizes, suitable for existing film cameras up to half-plate.

ADUROL IN CONCENTRATED SOLUTION.

ADUROL-SCHERING, for which Messrs. A. and M. Zimmermann, of 9 and 10, St. Mary at Hill, E.C., are the agents, and which has many times been referred to in our columns, is now sent out in the form of a concentrated solution, three and half ounces of developer costing a shilling. It keeps indefinitely, and is recommended for plates, films, and lantern slides. Messrs. Zimmermann inform us that the makers—Schering, of Berlin—recommend adurol in concentrated solution as the most advantageous form of using this developer. From our former experience of adurol, we can recommend it as an admirable type of the modern quick-acting non-staining developer, so much in favour amongst amateurs for "universal purposes."

THE PAGET PRIZE SPECIAL RAPID PLATES.

Manufactured by the Paget Prize Plate Company, Watford.

We have received from the Paget Prize Plate Company, Watford, a sample of their Special Rapid Plates, which we have tested and found fully equal, if not superior, to any we have used of this well-known brand. We used ortol with metabisulphite of potash and carbonate of potash as a developer, and kept the quantity of restrainer at a minimum. The plates with very rapid exposures gave negatives with a long range of delicate gradation. The fineness of grain, the coating, and the quality of the glass leave nothing to be desired.

A HANDBOOK OF PHOTOGRAPHY IN COLOURS.

By THOMAS BOLAS, A. A. K. TALLENT, and EDGAR SENIOR.
London: Marion & Co., Soho-square, 343 pages. Price 5s.

Two years ago, when writing in our ALMANAC on the subject of colour photography, we suggested the preparation of a book treating comprehensively on the subject, and this present handbook, if less exhaustive than the one we had in our mind's eye, comes nearer to our ideal than any of the works by which it has been preceded. Save in one respect, it is expository rather than practical. The exception is the section on Lippmann's process of interference heliochromy, by Mr. Edgar Senior, the only English experimentalist, we believe, who has succeeded in obtaining good results by this method of colour photography. In his short digest of the process Mr. Senior gives working formulae based, it appears, on actual experiment. The first 100 pages of the book proceed from the pen of Mr. Bolas, who, with his customary thoroughness, traces the historical development of colour photography from the time of Seebeck down to the present; but by far the largest share of the labour of compilation has been accomplished by Mr. Tallent, who, in the 200 odd pages at his disposal, gives an exhaustive résumé of three-colour heliochromy, to which he appends an account of Professor R. W. Wood's system with diffraction gratings.

In a prefatory note Messrs. Marion & Co. remind us that thirty-one years ago they published the pioneer work on photography in colours, by Louis Ducos du Hauron, and it is remarked that, as compared with that remote time, photography in colours is now an industrial fact. To be sure! and yet it is incontrovertible that as yet colour photography has not acquired much hold of the commercial mind. It cannot be pretended that three-colour block-making enjoys considerable industrial success, while the kromskop system of Mr. Ives and the Joly process have not secured the favour they merit. On the other hand, Mr. Sanger Shepherd is making strong efforts to popularise his stained film transparencies, and they are so beautiful that we sincerely hope they will achieve very great vogue.

We make this observation for the purpose of pointing the remark that the laboratory accomplishments of colour photography, beautiful and interesting though they undoubtedly are, are chiefly remarkable as being scientifically interesting rather than as giving scope for industrial development. But this is a matter that deprives the book before us of none of its undoubted merits. All three authors have done their work well, Mr. Tallent, a very able lecturer and writer, having been most painstaking in his researches. We must own to having indulged in a

smile at some references to the work of Mr. Bennetto, whose strange utterances on colour photography attracted our close attention in these pages a few years ago. We can cordially recommend *A Handbook of Photography in Colours* to the student of the subject. We ourselves shall value it as a book of reference to a branch of photographic thought and investigation that fascinates by its very difficulties and elusiveness.

Studio Gossip.

A PRESIDENTIAL CANDIDATE AT A PHOTOGRAPHIC CONVENTION.—On the occasion of the Convention of the Nebraska Photographers' Association the members of the association were introduced to Mr. W. J. Bryan. The announcement that he would be present at the morning session was enough to cause every member and friend to be present. He spoke of his experience with photographers, of the many men in the profession whom he had been privileged to meet, and the one quality all possessed alike, viz., a happy expression. His experience with photographers has been quite extensive, and he said that he believed he had never yet sat for a picture but that, when he thought all was over and he had resumed his natural expression, the artist would hold up his hand and say, "Just one more."

News and Notes.

THE murderer of King Humbert, Bresci, being an amateur photographer, took as his last photograph that of the monument of Victor Emmanuel II. at Milan.

THE CONVENTION GROUP.—Mr. Percy Lund kindly supplies the following names, which are missing from the Key of the Convention Group, given with the JOURNAL a fortnight ago: 22, Mrs. Perkins; 61, Miss Hastings; 78, Mrs. Puckering; 112, Mr. T. Fitzgibbon Forde.

His Majesty Don Alfonso XIII., King of Spain, the Queen Regent, and court arrived a few weeks ago at San Sebastian. The day after his arrival the young King, having with him his "Kodak," went out walking accompanied only by an aide-de-camp. He took several photographs on the road, this being a favourite amusement of his Majesty.

CRIPPLEGATE PHOTOGRAPHIC EXHIBITION.—The annual Exhibition organized by the Cripplegate Photographic Society, and the Essex Middlesex Cycling Union, Ltd., will be held at the Cripplegate Institute, Golden-lane, E.C., from November 7 to 10, inclusive. The Hon. Secs. are Mr. A. T. Ward, Cripplegate Institute, E.C.; Mr. G. F. Sharp, Sach-road, Upper Clapton, N.E.

AN OPEN COMPETITIVE EXAMINATION TO FILL VACANCIES IN THE STAFF OF ASSISTANT EXAMINERS IN THE PATENT OFFICE WILL BE HELD IN LONDON IN SEPTEMBER NEXT. The present number of vacancies is ten. Limits of age, twenty-one and twenty-four. Particulars of the examination and forms of application, which must be sent in on or before August 23, can be obtained from the Secretary, Civil Service Commission, London, S.W.

PHOTOGRAPHY AT NIGHT.—Mr. T. Stokoe, of Clare, Suffolk, writes: "Thinking that it may be of interest, I send you print from negative of Walton-on-Naze Pier, taken about 8.30 p.m., after the electric lights were turned on, and showing them distinctly. The negative is absolutely untouched." The photograph is very good, though, of course, deficient in shadow detail. Most noticeable, however, is the fact of no halation showing about the electric lamps, which are sharply outlined.

A GOOD EXAMPLE.—We read in a Reuter's telegram that the Spanish Government has prohibited the reproduction of the portrait of Bresci, the assassin of King Humbert, in the newspapers. If this example were followed more generally, we cannot but think that it would be for the good, and tend, to some extent, to check morbid curiosity. It would also tend to good in another way. Anarchists, and other fanatics, love notoriety and the knowledge that their portraits will be published, far and wide, when their crime is done is often a further stimulant to the deed; but for photography the publication of the portraits of criminals of this class would almost be a thing unknown.

THE KNIGHT OF THE CAMERA.—Down in the lower mysteries of the Houses of Parliament is a dark room, and in it Sir Benjamin Stone develops his photographs. He took a *Daily Mail* representative there last week leading him through a maze of stone passages, then out on the terrace, and off again beneath tons of stone. "This," said Sir Benjamin, stopping at one of a series of his Windsor Castle photographs, "is a picture of the carvings done by prisoners in the Norman Tower." Hung on the rough stonework, centuries old, was a steel helmet with some cavalry swords. Carved in the stone, in perfect preservation, were names of prisoners who had languished there in 1642. "When we have got over the general election, I shall go to India. I have received invitations from the Maharajah of Baroda and other Indian princes, and shall go round photographing them and their Courts."

A PHOTOGRAPHER'S WIFE MURDERED.—An inquest was held on Thursday, August 2, at Hackney, on the body of Mary Ann Woodall, aged 43, the wife of a photographer, of Gilpin-road, Clapton Park, who met her death at the hands of some person unknown on the previous Sunday evening. George Woodall, the husband, stated that, at 6.30 on Sunday evening, he wa

on the Essex bank on the river Lea, opposite the Robin Hood. He photographed four men in a boat, and each of them had a photograph, but one refused to pay. All four returned to their boat, and were making off, when witness's wife called out, "Don't rob a poor man." The man who refused to pay jumped out of the boat, and made a rush at the camera. The deceased went to protect it and the ruffian then struck her a blow on the left side of the neck, felling her to the ground and smashing the camera. She got up, but was again knocked down. All four men then rowed away as fast as they could in the direction of Lea Bridge. The deceased, who was unconscious, was ferried across the river to the Robin Hood and then taken home in a van. The deceased died on the following day. The man who committed the assault was young and dark. He had a slight moustache and a thin face, and wore a suit of blue striped plaid and close-fitting trousers, such as were worn by costermongers. A doctor said the death was due to the rupture of a small blood-vessel in the brain, and was the result of direct violence. A detective stated that inquiries were being made, but they had not been able to find either the man or the boat. The jury returned a verdict of "Wilful murder against some person unknown."

Commercial Intelligence.

MR. HARRY WADE, of 29, Blackfriars-street, Manchester, asks us to state that he is prepared to give trade demonstrations for a firm of high-class reputation. He is well known amongst the photographic societies of the country, and would be glad to hear from any firm who desire a demonstrator.

MR. C. T. SUTTON, of 114, Akerman-road, Brixton, S.W., writes: "Having occasion to refer to your issue of July 6, I noticed, in Answers to Correspondents, an inquiry for 'Machinery for manufacturing P.O.P.' Should your correspondent be still open, I may be able to put him in the way of obtaining same if you would acquaint him with the fact."

MESSRS. RAE BROS. of 134, St. Vincent-street, Glasgow, inform us that they have acquired the old-established photographic and lantern business of George Grieve, 29, New Scott-street, Perth. The business has been in existence for over a quarter of a century, first in High-street, and latterly in New Scott-street. Mr. Grieve is retained as manager of this branch shop.

GLASSWORKERS' STRIKE IN BELGIUM.—Last week, out of nineteen glass factories, eleven closed. Ten thousand workmen are on strike, and their numbers will be added to. The strikers demand the dismissal of the non-society men. This strike will probably deal a fatal blow to the glass industry in Belgium. Many large manufacturers have decided to take this opportunity of definitely closing their works, which suffered much by the increased price of coal.

THE PARIS EXHIBITION.—A meeting of the Exhibitions Committee of the London Chamber of Commerce was held on Tuesday, Sir Albert K. Rollit, M.P., presiding, at which it was decided that the chairman should be requested to prepare a general report on the subject of the Paris Exhibition and the action of the Royal Commission with reference to the British Section and other matters affecting British exhibitors. The opinion was generally expressed that the representation of British commercial elements at the Exhibition has been most unsatisfactory.

GREAT BRITAIN AT THE PARIS INTERNATIONAL EXPOSITION.—"It is truly strange," says *Feilden's Magazine*, "that, however great the space of time allotted to contractors and exhibitors may be, the opening days of nearly all great exhibitions find everything in a state of ill-disguised chaos, and weeks—nay, months—elapse before the various displays are in working order. This has been demonstrated once more in connexion with the Paris Exposition, where, even at this late date, some displays are still in an unfinished condition. Early visitors to the Paris Exposition have seen little more than a group of buildings in their nascent condition, while the exhibits are hardly unpacked as yet, though there were a few notable exceptions. The exhibits of Great Britain did, unfortunately, not belong to the latter class. As we are informed, by a reliable commissioner whom we engaged to give an impartial report on the subject, there existed, even at a very recent date, quite a chaotic condition in the sections allotted to British enterprise, and many of the exhibitors are yet deprived of the power required to drive their machinery. How much of this state of affairs is due to the indifference or intentional neglect of their French hosts is a question which we prefer to leave unanswered. For a great portion, however, of the unsatisfactory state of the British exhibit the exhibitors themselves must be blamed, since their phlegmatic nature and self-satisfied indolence did not permit them to rise to the occasion, as some of their Continental and, still more so, their Transatlantic competitors have done, who got their show into order in spite of the obstacles placed in their way. But, even after having got their displays into shape, the British exhibitors still remain at a disadvantage in Paris because of the lack of linguistic attainments on the part of their representatives, and their foolish assumption that intending customers will go to the trouble of getting the English catalogues offered to them—and offered, moreover, it seems, not very liberally—translated." The author of the article then repeats what has been repeated over and over again by our consuls and foreign representatives, namely, that our manufacturers lose a great deal of the modern trade by their injudicious adherence to obsolete methods and their stubborn refusal to make concessions to their customers. "If we wish to regain," he adds, "our industrial supremacy, which, to a certain extent—fortunately to a very small extent only—we have lost, we must make up our mind to be abreast of the times. Once we do so, we must succeed, for, as regards wealth, conditions of existence, and perseverance, there is no nation equal to our own. All we need is to decide at once upon what is necessary, and, having realised this necessity and decided to meet it, our very stubbornness, so much in our way at present, will be our surest guarantee of success."

Patent News.

The following applications for Patents were made between July 23 and July 28, 1900:—

COLOURED PHOTOGRAPHS.—No. 13,317. "Improvements in Coloured Photographs and the Process of Making them." Complete specification. Communicated by the Grenier Art Company, United States. S. E. PAGE.

CAMERAS.—No. 13,364. "Improvements in Photographic Hand Cameras." J. H. RANSOM.

SHUTTERS AND CAMERAS.—No. 13,377. "Improvements in Photographic Shutters and Cameras." J. E. THORNTON.

SHUTTERS.—No. 13,378. "Improvements in Photographic Roller-blind Shutters." J. E. THORNTON.

SHUTTERS.—No. 13,379. "Automatic Timing Device for Photographic Shutters." J. E. THORNTON.

PRINTING FRAMES.—No. 13,392. "Improvements in Photographic Printing-out Frames." H. HIGGINS.

CAMERAS.—No. 13,416. "Improvements in Cameras." T. BAKER.

PLATE-HOLDER.—No. 13,427. "Plate-holder to a Photographic Plate." F. THÉRÉMIN.

APPARATUS AND PROCESSES.—No. 13,430. "Improvements in Photographic Apparatus and Photographic Processes." M. HIRSCHENSOHN.

SHUTTERS.—No. 13,527. "Improvements in Photographic Shutters." W. H. Morgan.

RECTIFYING PHOTOGRAPHS.—No. 13,555. "Apparatus for Rectifying Photographs." T. A. G. STRICKLAND.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
14.....	Hackney	Question Box.
18-25	Ashton-under-Lyne.....	Excursion: Bettws-y-Coed.
18.....	Croydon Microscopical	{ Excursion: Kew Gardens. Leader, Mr. Ballock.
18.....	Redhill and District	{ Excursion: Hampton Court. Leader, Francis H. Ellwood.
18.....	West London.....	{ Excursion: River Colne, from West Drayton to Uxbridge.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 2.—Mr. S. H. Fry in the chair.

The HON. SECRETARY passed round some pamphlets and samples of kachin, which members promised to try and report on.

The CHAIRMAN raised the subject of stand development, and inquired whether, in the opinion of members, the method possessed any practical advantages?

Mr. P. EVERITT thought it useful, inasmuch as a number of plates, some of which might be under and over-exposed, could be successfully developed in the same dish. He had, however, noticed that the outline of the high lights was sometimes followed by a transparent line which completely spoilt the negative.

Mr. HENDERSON passed round a transparency, which was badly stained. He explained that the stain was caused by alternately placing the plate in new and old developer. He had been unable to obtain the effect by any other means.

Mr. WELFORD considered the stain was caused simply by prolonged development.

Mr. FRY thought it was occasioned by some peculiarity of the gelatine.

Mr. HENDERSON showed a badly distorted negative of Durham Cathedral, and from which he had obtained a transparency, the lines of which were perfectly rectilinear.

Mr. EVERITT passed round two very fine examples of work done with the new Beck-Steinheil lenses. The subject was a difficult one, being a piece of lace with a very intricate pattern, and it was agreed to be a striking proof of the high quality of these lenses.

Mr. TEAPE showed an excellent portrait on enamel. He had made a lengthy series of experiments, and had tried all published formulae for enamels without success, but had succeeded in inventing one of his own, which had proved completely satisfactory.

PHOTOGRAPHIC CLUB.

A DISCUSSION took place on Wednesday, August 1, on the variation of colour in Velox, Gravura, and kindred papers. It appeared to be the general experience that, in order to alter the colour of the print, not only a variation in exposure, but also a variation in the developer, had to take place. Mr. FOXLEE, however mentioned that, if an iron developer be used, a change in the composition of the developer was not necessary, prolonged exposure and prolonged development being alone sufficient to produce reddish tints, whilst with a shorter exposure blacks could be obtained with the same solution. Messrs. Griffin sent some samples of a new form of kachin developer, in conjunction with which potassium carbonate may be used, which was not the case with the old form.

FORTHCOMING EXHIBITIONS.

1900.

- August 21 Royal Cornwall Polytechnic Society. W. Brooks, Laurel Villa, Wray Park, Reigate.
- Sept. 21-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- November 7-10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
- „ 12-17 Ashton-under-Lyne.
- „ 21-23 Hackney Photographic Society.

1901.

- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

STRENGTHENING METHYLATED SPIRITS.

To the Editors.

GENTLEMEN,—Replying to a query in the JOURNAL of the 27th ult., "B. G." can strengthen methylated spirit without trouble of distilling, and, I should think, without infringing the law, by simply shaking it up with some sub-carbonate of potash, known as salt of tartar; the water in the spirit dissolves the salt, and, becoming of greater specific gravity, settles to the bottom, when the lighter spirit, deprived of most of the water, can be drawn off.—I am, yours, &c., THOS. STOKOE.

Clare, August 1, 1900.

NATURAL CLOUDS IN LANDSCAPES.

To the Editors.

GENTLEMEN,—Referring to your leaderette on "Natural Clouds in Landscapes," on the 27th ult., permit me to say that I managed a short time ago, to reduce—with Farmer's solution—a good cloud in a hayfield scene. By holding the negative, sky end down, after fixing, I succeeded with the aid of a camel's-hair brush dipped in the solution and carefully applied, in reducing the cloud sufficiently so as to make it printable along with the view. I wish we had tried some such plan years ago, as many an excellent cloud has been rendered useless by being too dense.

I enclose a spoiled print to show result, and regret we have not a good one printed to send you.—I am, yours, &c., Wm. BROWN.

8, Janefield-place, Paisley.

[The clouds in the print are naturally rendered, and are in harmony with the rest of the photograph. There is, of course, nothing new in our correspondent's suggestion, but it may in this connexion be useful to other workers.—EDS.]

PHOTOGRAPHY AT COLOMBO AND KANDY.

To the Editors.

GENTLEMEN,—We might mention, for the benefit of amateur tourists, that we have dark rooms at their disposal at Colombo and Kandy, and that any advice will be willingly given them as to tropical exposures. Most amateurs are under the mistaken impression that they can give a marvellously short exposure in the tropics, with the result that they get many disappointments. We find they go with their cameras and expect to get good results on subjects such as tropical foliage, native characters, &c., and often use a small stop, which, of course, does not give the plates or camera a chance.—We are, yours, &c., LL. MADDOCK.

Kandy, Ceylon, July 16, 1900.

THE PLATE-MAKERS' ASSOCIATION.

To the Editors.

GENTLEMEN,—I note, in your Answers to Correspondents, that you state that the Plate Paper-makers' Association "have arranged a scale of discounts for *bonâ-fide* dealers." Allow me to inform you, and your correspondent, that the fact that one is a *bonâ-fide* dealer, and does not cut prices, and gives complete proof thereof, is of itself no help whatever to getting plates and paper at dealers' prices.—I am, yours, &c.,

G. WATMOUGH WEBSTER.

Studio, 33, Bridge-street-row, Chester, Aug. 5, 1900.

LOSS OF COVERING POWER IN A LENS EXPLAINED.

To the Editors.

GENTLEMEN,—Some time ago I asked you a question, *viz.*, If a lens could fall off in its marginal definition and covering power? I asked the question because a lens of mine appeared to have done so. It may interest you to know the cause, which I accidentally discovered. The wheel diaphragm screw had got loose. It is a shouldered screw, and the diaphragm was running on the threaded part, and was considerably out of true—*i. e.*, the apertures were not axial with the lens.—I am, yours, &c.,

J. E. GUBBINS, Lt.-Col.

Westward Ho! Bideford, August 6, 1900.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF INDIA.

To the Editors.

GENTLEMEN,—By to-day's mail I have pleasure in forwarding to you a copy of the Prospectus of our Exhibition, to be held in Calcutta early in January next,

Will you be kind enough to draw attention to it in your JOURNAL, as we are anxious to make the event as successful as possible.

Arrangements are being made whereby London exhibitors will be able to send their exhibits to an address in London, whence they will be dispatched to India at the expense of the Society, and I hope to furnish you with the particulars during the next fortnight.

Five gold, ten silver, and fifteen bronze medals will be awarded, but we shall be very pleased to receive pictures from persons who are willing to assist us by exhibiting but not desirous of competing.—I am, yours, &c.,

T. C. DOWNING, Hon. Exhibition Secretary.

57, Park-street, Calcutta, July 18, 1900.

[For the information of European exhibitors we extract the essential portions of the prospectus]:

The Exhibition is divided into two classes:—(a.) Open to the world, amateur and professional. (b.) Amateurs of the Society. Provided the Judges deem the exhibits of sufficient merit, the following medals will be awarded:—A special medal for the best photograph in the Exhibition; five gold medals; ten silver medals; fifteen bronze medals; which it is proposed to apportion as follows: For all exhibitors, professional or amateur: three gold medals; seven silver medals; ten bronze medals. For amateurs of the Society: two gold medals; three silver medals; five bronze medals. It is proposed, provided they fill, to medal the best in each of the following classes: Class 1, Landscape; 2, Architecture and Interiors; 3, Portraits and Groups; 4, *Genre* Pictures and Studies; 5, Photographs of Objects in Motion; 6, Lantern Slides and Transparencies; 7, Photo-mechanical Processes; 8, Apparatus and Appliances. Pictures should be sent framed, if possible. Where this is impossible, the Society will provide frames without charge, during the Exhibition, for photographs approved by the Judges. This does not apply to Indian exhibits, which will only be framed by the Society at the expense of the owners. There will be no charge for wall space. Exhibits from Europe should be dispatched before November 15; America, November 1; Australia, November 1. All goods and pictures should be addressed to the Hon. Exhibition Secretary, Photographic Society of India, 57, Park-street, Calcutta, and must reach him not later than December 25, 1900.

PHOTOGRAPHS REGISTERED:—

- Watson & Senior, 6, Church-street, Inverness.—Photograph of painting, entitled "*Saved from the Wreck*."
- E. Smith, 170, High-street, Lewes, Sussex.—Photograph of Earl De la Warr. Two photographs of triumphal arch, Station-road, Bexhill. Photograph of triumphal arch, Old Town, Bexhill. Photograph of group of coastguards. Photograph of Earl and Countess De la Warr and family. Photograph of dinner-table at Hotel Metropole, Bexhill. Photograph of Countess De la Warr and infant Baron Buckhurst. Photograph of presentation of illuminated address to Earl De la Warr. Photograph of Earl de la Warr addressing the Council at Bexhill.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

DIRECTORY OF PHOTOGRAPHERS.—R. C. asks where he can obtain a list of the professional photographers of England? — In reply: Messrs. Percy Lund & Co., of Bradford, publish a directory of photographers.

FLAT PORTRAITS.—T. COSTORPHINE: From what you describe as "all the faces looking flat," we suspect you are using too much direct front light. If you send us two or three examples, we may probably be able to assist you; we cannot without.

SHELLAC VARNISH.—VARNISH. Neither orange nor button lac will completely dissolve in alcohol. There will always be a sediment, for the reason that certain constituents of lac are not soluble in spirit. All you can do is to let the insoluble portion subside and then decant the clear solution.

REORDERS.—J. A. HOWARTH asks: "Is an order for an enlargement from an old negative (originally taken for cabinets) considered as a reorder or not?" — We are afraid we do not quite understand this query. A first order for an enlargement can certainly not be termed a reorder even if it is from an old negative.

GELATINE MOUNTANT.—H. C. MCPHERSON. The formula as given in the ALMANAC is quite right, but you have employed the wrong kind of gelatine, hence the reason of its precipitation when the spirit was added. Nelson's No. 1 gelatine was given in the formula, and you have used Coignet's, which is of quite a different character, and it will not bear the quantity of spirit given without precipitation.

GLASS POSITIVES.—W. HAMMOND. The glass positive reached us smashed to pieces. However, by putting them together, we can see the cause of the frosted-silver streaky appearance on the glass side of the picture. It is due to the glass being imperfectly cleaned before the collodion was applied. The remedy, in future, is obvious. The formulæ you are using are quite correct, and the collodion can be relied upon.

REDUCER FOR BROMIDE PRINTS.—PICKAXE writes: "I should be glad if you could tell me of a good and simple reducer for bromide prints, which cannot stain like ferridcyanide potassium. Is chloride of lime any good? I find it dissolve the gelatine." — In our issue for June 22 last is given a method of reducing bromide pictures with cyanide of potassium. Personally we do not think reducing prints worth the trouble, as they are rarely so good as prints that have not been reduced.

SALTED PAPER.—W. CASSIE asks "where a good photographic paper, plain can be obtained, such as used to be employed many years ago for salted paper prints?" — It is a little difficult to say, off-hand, where it is to be obtained now unless in wholesale quantities. Messrs. Otto Koenig & Co., Cross-street, Finsbury, are the wholesale agents for the Saxe papers, and Messrs. Marion supply the Rives. The latter house will, no doubt, supply you with a quire or two. For salted paper prints the thick paper was used, somewhat thicker than is generally now used for albumenising.

FIXING.—DOUBTFUL says: "For fixing our negatives we use the grooved porcelain tanks. For some time we have been in the habit of renewing the hypo in the tank by pouring in the solutions used (of course, only once) in fixing bromides and ordinary gelatine P.O.P. Would you consider that there would be any danger to the permanency of the negatives in using this plan, which saves time in mixing solutions? The hypo solution is quite clear and presumably not much weakened." — Probably not; that is, if the solution is still strong enough to properly fix the negatives. We should, however, prefer to use a new solution, as hypo is so very cheap.

A FINE-ART UNION.—S. & S. write: "Will you kindly tell us whether there is a Fine-Art Union that acquaints its members with the latest-published fine-art plates, and, if there is such a Union, who is the Secretary? Should there not be such a Union can you make a suggestion as to how we may obtain names and addresses of the different fine-art dealers?" — In reply: We are not cognisant of the existence of such an institution as that mentioned by our correspondents. With regard to the addresses of art-dealers these can be obtained from the various directories. Such a directory may be published by Messrs. Kelly. The information asked for hardly comes within our province to supply.

THE PROCESS BUSINESS.—R. B. writes as follows: "I know nothing of photography, but I am told that the process-block business is a very lucrative one, and I should like to learn it. Will you please tell me if it is a trade a young fellow can teach himself, and the probable cost of an outfit?" — In the first place, our correspondent is under a misapprehension in imagining that the process-block business is a very lucrative one. Skilled workers tell a very different tale. Whether our correspondent will be able to teach himself will depend, of course, upon his intelligence and perseverance. As regards cost of outfit, Messrs. Penrose & Co., Upper Baker-street, W.C., will supply a price-list of the necessary appliances.

GUM-BICHROMATE.—G. U. M. If you wish to give the gum-bichromate process a fair trial, follow Mr. Packham's instructions implicitly, using good gum arabic, and not so-called "office gum." You may probably trace your failures to the use of that.

OPALINES, &c.—H. COXHEAD. The metal rims, and plush fittings, for opalines are supplied by all the large houses that supply photographic material, such as Marion's, Houghton's, Fallowfield's, and the like. Any of the above houses will also supply lenses and cameras for stamp portraits. Also floral masks—indeed, all the other things you inquire about.

COPYING PAINTING.—PROVINCIAL. Coating paintings with glycerine and water has been mentioned as a means of rendering them easier to copy, and that is, possibly, what you refer to; but it is not to be recommended, and no owner of a valuable picture would allow of its being subjected to any such treatment. The glycerine might, on account of its deliquescent properties, very materially impair the durability of the picture, unless it was completely removed—a very difficult thing to do.

INTENSIFICATION.—W. CONWAY says: "I have heard that negatives can be intensified with bichloride of mercury alone, when only a little intensification is required, without any second treatment. Will you please say how it is done?" — The first action of a solution of bichloride of mercury is to darken the image and then to bleach it. The action must be stopped by washing before the bleaching sets in, as it does very quickly. This is an excellent method of intensification when only a little more density is required in the negative.

FURNELL'S LENS.—G. POWELL writes: "I see, in an old volume of the JOURNAL, a description of a lens by Mr. Furnell, in which the back glass is a spectacle lens, which can be replaced by others of different foci, so as to alter its focal length. Will you please tell me who is the maker, as I should like to get one?" — So far as we remember, the lens was not put upon the market. But sufficient description of it was given in the article for any optician to construct one for you, or for you to construct it for yourself.

SENSITISING ALBUMEN PAPER.—T. GARDNER says: "On floating albumen paper on the silver bath it curls up towards the back, and I cannot get it to lie flat on the solution so that it will be evenly sensitised. Can you tell me a remedy, as I am quite a novice in sensitising my own paper?" — Some papers are very prone to this when they are exceptionally dry, as they are likely to be with the dry and hot weather we had a little while back. However, the remedy is very simple. When the paper is floated, just breathe gently on the back for a few seconds, and it will then lie down perfectly flat.

OBSTRUCTED LIGHT.—ALPHA writes: "I have just taken the above premises and gone to great expense in putting up a studio having a fine north-east light. Now the next-door neighbour is putting up a huge wooden hoarding, which will quite stop off all that side light. On remonstrating with him, he says that he objects to his windows being overlooked by my customers, and that he will not think of taking it down. Cannot I compel him, as it obstructs all my side light that I want for my business?" — No. Your neighbour has as perfect a right to put up what he chooses on his premises as you have on yours. You have no remedy that we can see.

A PUZZLE PHOTOGRAPH.—THE DRAFED FIGURE writes: "Can you tell us why the globe in enclosed photograph comes in the position in which it is? The photograph was taken some years ago, on a fast plate, unbacked, by magnesium powder flash. The cap was off whilst the slide was drawn, and the flash made directly after. Half the globe could be seen by the head and the reflection in mirror behind, the gas being lit. The developer was pyro. No other mirrors in room and another gas bracket at the other side of one seen. It is quite a puzzle to us and to many other photographers." — The only suggestion we can offer is that the plate received a double exposure—the first, or second, sufficiently long for the gas globe to be impressed on the film.

STAINED ENLARGEMENTS.—R. C. V. L. writes: "Could you tell me the probable cause of the following difficulty:—I have been enlarging on bromide paper, using amidol, washed for a couple of minutes and then fixed, some in plain hypo and some in acid hypo; in each case, during washing, brown stains have come up which ruined the whole enlargement, some appeared after a few minutes' washing, others after a couple of hours. I have used the same paper and developer, &c., often for small contact prints without any stains. Could you suggest the cause. If a portion of the print was exposed to the air in the washing, could that cause a stain? It is possible that might happen when washing large prints?" — Without seeing an example we cannot give a definite opinion. Possibly the stains may be caused by insufficient washing before the prints are fixed, or they may be due to the print being unduly exposed to air while fixing. We do not imagine that they are caused by exposure to air while they are washing.

TONING TROUBLES.—ANXIOUS writes: "Along with this note I send you two photographs toned with gold and platinum (matt paper). The one you will see is unstained, and was done some months ago, the other is not only badly stained, but seems to be reduced, eaten away, the colour quite taken out in the parts stained especially, and was put on the mount last Thursday. A number of others done at the same time have gone the same way. The instructions, especially with regard to clean working and washing, have been followed to the letter, and I am quite at a loss to say what is causing the mischief. Might I ask you to favour me with an opinion? I can't say how much obliged to you I will be for any help you can give, as I have a large printing department under my care, and it is a terrible business to get such results." — Beyond saying that it is due to something in the manipulation, we are afraid, with no details, we cannot help you much. If we saw the work carried out, no doubt we could. We would suggest greater care in the washing in the different operations; also a longer fixing in a perfectly new solution of hyposulphite of soda.

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EX CATHEDRA.

WE are pleased to state that our last week's appeal on behalf of an old photographer, in whom advanced age and misfortune have not withered the honourable ambition of earning his own living, has met with success. Sums of money have reached us from several sympathetic readers, and we thank them heartily for their generous offers of assistance. In all probability this form of aid will not be required, as we have had an offer of a whole-plate camera, which will, no doubt, meet the requirements of the distressed photographer. Mr. J. B. Payne, of the celebrated firm of Mawson & Swan, Newcastle-on-Tyne, writes us as follows: "In answer to the paragraph contained in last week's BRITISH JOURNAL, I write to say that we have a whole-plate camera, mahogany, bellows, body, with focussing screw and two double slides. It is a well-made instrument and has never been used, but it is of the old-fashioned pattern and not quite light enough for modern ideas. If you think that it would prove serviceable to the gentleman who is placed in the unfortunate position mentioned in the paragraph, kindly

let me know and I will send it up for his acceptance." We have, of course, accepted Mr. Payne's kindly offer, and have undertaken to see that the camera is properly bestowed. If it should require some slight alteration, perhaps our friends who have sent us money would wish it applied to the necessary purposes? We will hold their remittances in the mean while, and again ask them to accept our thanks for their help.

* * *

THE third Annual Report of the Council of the Röntgen Society for the year 1899–1900 has been sent to us. There is now a total membership of 178, and of that number sixty-two gentlemen joined during the year, many of them residing in distant parts of the British Islands and the colonies. The Society now possesses a permanent home at 20, Hanover-square, and the attendance at the meetings has averaged thirty. One passage in the report is of special interest in relation to the deplorable South African War, which every one must hope is nearing its termination: "Of the growing use of the Röntgen rays in surgery the reports from the medical officers in South Africa are sufficient evidence of the recognition of their value in military service, and we may hope for interesting papers later from members of the Society who have been using various forms of apparatus in the field." The report concludes: "The Council has much pleasure in announcing that Dr. J. B. Macintyre, of Glasgow, has consented to being nominated as the next President, and feels sure that the Society will welcome in this position one of the earliest and most prominent of practical X-ray workers." We wish the Röntgen Society a continuance of success in its valuable work.

* * *

MESSRS. CADETT & NEALL, the well-known dry-plate manufacturers of Ashtead, Surrey, send us a sheet of well-printed half-tone illustrations, designed to point out the advantages of using the Cadett spectrum plate in three-colour work and in the correct reproduction of coloured objects in monochrome. Included is a three-colour print from a lithograph, the combined colour and half-tone negatives having been taken direct on the Cadett spectrum plate with the Sanger Shepherd trichromatic light filters; but, of course, no opportunity of comparison with

the original is available. On the other hand, a vase of flowers supplies occasion for the reproduction, in half-tone, of (1) a negative on an ordinary plate, and (2) a negative on a spectrum plate exposed through the Absolutus light filter. In the one case the values are totally wrong; in the other they appear, so far as we can judge, to be accurately rendered. We wish Messrs. Cadett & Neall success in their endeavours to stimulate the interest of photographers in the direction of colour correct work. It has seemed to us that of very recent years there has been a tendency on the part of many to lapse into a state of things that prevailed in the early eighties, when orthochromatic photography with gelatine plates was very little practised indeed. Messrs. Cadett & Neall have done and are doing much to educate photographers in the importance and desirability of securing correct renderings in photographs; but it is missionary work of a kind which must never cease, for every year thousands of people take up a camera for the first time, and perhaps only a very few of them stumble across a little orthochromatic knowledge by accident.

* * *

FOR the purpose of drawing public attention to their lenses and cameras, Messrs. Goerz, the optical house, of Berlin and London, are issuing a half-tone illustration, which is worth mention, if only on account of its uncommon size. The block measures $31\frac{1}{2}$ inches by 15 inches, and it is printed on stout surfaced paper, the dimensions of which are 38 inches by 26 inches. The enlargement from which this block was copied was made from a half-plate negative taken with a Series III. Goerz double anastigmat. A shutter exposure was given the subject, which represents a number of cavalry soldiers putting their horses over a stone wall. The engraving is a very good one, and, apart from the merits of the production, which, in the absence of more specific data relating to the lens, exposure, &c., can scarcely be discussed, is undeniably striking in effect. Avowedly sent out as an advertisement, the engraving is one that can hardly fail to achieve its object. Messrs. Goerz recommend it to photographic dealers in these words: "This picture forms a first-class advertisement, and, when put into your shop window, sale-room, or office in a conspicuous place, it will quickly attract the attention of the public. We would recommend enclosing the picture in a plain frame, which will increase the effect considerably and prevent the picture getting soiled." The house of Goerz is obviously not lacking in business enterprise.

* * *

A RECENT advertiser in the JOURNAL received the following answer to his advertisement, and has handed it to us to be used at our discretion. It is a lithographed circular, and we reproduce it word for word:—"275, High-street, Hammersmith, W. Dear Sir,—I have seen your advertisement in THE BRITISH JOURNAL OF PHOTOGRAPHY. As the manufacture and sale of a good article used generally by the profession offers such a much better opportunity than photography alone to make a good income, I write to ask you if you were shown in the most conclusive manner that you could start the making of P.O.P., and it was also proved to you that the paper you would make would be far superior to that turned out by any of the large firms, would you pay a reasonable sum to be thoroughly taught and put in the way to work up a connexion, that you might carry on a business on your own

account, either by itself or in conjunction with photography? Those who do not practically understand are under the impression that P.O.P. must be made by machinery, but I know, and can show conclusively, that paper coated by my system, that is, by hand, is far superior, and, although of course it cannot be done so quickly, it is purer in colour, and quite free from the many faults to be found in all brands of P.O.P. coated by machinery. It is the most profitable and certain business any one with small capital can embark in. It requires only one moderate-sized or two small rooms, anywhere (London, country, or seaside), and 20*l.* capital would be sufficient not only to provide all the necessary apparatus, but sufficient paper, chemicals, and everything else (including circulars, &c.) to make a good start. One person, *without any assistance whatever*, can turn out five quires a day, complete for sending to customers, by light work of seven hours. To make a quire by my process costs 6*s.* inclusive; the usual selling price is 15*s.* and 6*d.* extra for postage, with ten per cent. allowed to the profession who take a certain quantity per month. I recommend selling at 12*s.* 6*d.* per quire, post free. This allows 6*s.* profit on every quire sold, so that, if you only sell twenty quires a week, you make 6*l.* profit, and your expenses scarcely anything. You will, doubtless, know as well as I can tell you that in England alone there are over 20,000 professional and quite a million amateur photographers, and I can show you that orders can always be got from all parts of the world for a good paper. It is cash with order, and business is done by sending out circulars and small samples by post. Even the smallest photographers use one quire a week, so that even twenty such customers would give you a profit of 6*l.* per week. After I have furnished you with absolute proofs of success, and show you there is no risk whatever, I undertake to teach you thoroughly until you can do everything for yourself, draw you up a suitable circular, and show you how to get a connexion for a premium of 25*l.* I guarantee that after two or three lessons you shall be able to do everything perfectly from beginning to end, after which you can either do all the work yourself or simply mix the formula as required, and can get a young man or young woman to do all the rest. If you think my offer sufficiently good to wish to go further into the matter, you can see me here at any time if you send me a line first, giving me time to answer in case I could not be in. I will then go fully into everything, affording you absolute proofs and satisfy you on every point.—Yours faithfully, A. Morris. The demand for a good P.O.P. is practically unlimited."

* * *

THE handwriting of Mr. "Morris" is familiar to us. When last we saw it at the foot of a letter it traced a different name, and in those days it was a process for the preparation of ready-sensitised albumenised paper that was offered for sale. In the foregoing document there is at least one glaring error of fact. There may be a million amateur photographers in England—although we doubt it—but there are not "over 20,000 professionals;" a quarter of that number, say 5000, would be nearer the mark. Mr. "Morris's" fondness for round figures has betrayed him into an exaggeration. The scheme described in his circular can be dismissed in a few words. The person who, after paying twenty-five pounds for instruction in the hand preparation of gelatino-chloride paper, embarked a sum of twenty pounds as capital in the expectation that a profit of 6*s.* per week would result, would probably lose his money as the P.O.P. market is already well stocked. Why, it may be asked, if

money is so easily made in this manner, does not Mr. "Morris" himself engage in the commercial production of a paper which, according to him, is "far superior to that turned out by any of the large firms," and that can be sold at 12s. 6d. the quire, to yield a profit of 6s.? At this particular juncture we know of no business so hazardous as that of the manufacture and sale of gelatino-chloride paper, either on a large or a small scale, and it is one against which the small capitalist in particular should be emphatically warned. But Mr. "Morris's" circular is not one that calls for lengthened discussion. We need only remind our readers that a year or two ago we came across cases in which persons were induced to take up the preparation of albumenised paper on a small scale, only to find that the market was already well supplied with that article. Into some of those cases we made personal investigation, and in two of them we were the means of preventing a further outlay of money which would have been sheer and deliberate waste.

AUTOMATIC PLATES.

LATITUDE in a plate is a quality upon which plate-makers have recently laid particular emphasis. More than one maker of repute has based his claims to patronage not on the production of the very greatest rapidity, but on a plate which, while being of considerable rapidity, leaves room for a considerable departure from correct exposure or—it is the same thing—undertake the correct reproduction of subjects containing a very long range of light intensities. In other words, the importance of a long straight portion in the characteristic curve of the plate as planned by Hurter & Driffield is insisted upon even by makers who do not adopt Hurter & Driffield measurements nor use their terminology. With the ordinary means by which plates of "long straight curve" are to be produced we do not now propose dealing. We wish to refer to two proposals by which an automatic character is sought to be given to the plate. The first of these is not exactly new, but assumes topical interest from the fact that plates thus made are being placed upon the (French) market. It was, in fact, some ten years ago that Monsieur P. Mercier, a well-known experimenter among our neighbours across the Channel, recorded the curious results obtained when plates were treated with certain organic substances before exposure to light. He found that some substances, among which are oxidised developers, and particularly oxidised amidol, act as retarders when plates thus treated with them come to be developed, whilst others, including morphine, tartar emetic &c., act under similar conditions as accelerators. He claims to be able to prepare a plate, by previous treatment with a solution of oxidised amidol of strength from .01 to .05 per cent., which yields good negatives even if 100, 1000, or 10,000 times the correct exposure be given.

The plate for which claims somewhat of this character are made is now we are informed, being made by M. Jouglia under the name, "L'Intensive;" the inventor speaks of it as follows (we quote from a recent paper before the French Photographic Society):—

"A mixture of retarders and accelerators enters into the composition of this plate with the result that it possesses the following apparently contradictory properties.

"(1) It develops rather more quickly than ordinary plates in rapid developers such as amidol or metol, giving, with short exposure, the maximum of vigour and freedom from fog.

"In slow developers, on the other hand, such as glycine, hydroquinone, pyrocatechin, used in conjunction with carbonates or alkaline phosphates, and with more or less bromide, the image appears twice or thrice as quick, and develops much more vigorously and brilliantly than do ordinary plates.

"Hence, in cases of great over-exposure (amounting to, say ten or twenty times the normal exposure), a liberal proportion of bromide can be added to the developer, and yet good negatives obtained quickly. Ordinary gelatine plates would require extremely slow development to give passable negatives.

"The 'intensive' is thus an automatic plate which can be exposed to any extent and developed in any developer, but yet gives a perfect negative. With ordinary plates a rapid developer is advisedly used for under-exposures and a slow developer for over-exposures, but in the case of 'intensive' plates this does not hold good.

"In the matter of developer, metol-hydroquinone, which is apt to give hard negatives with snap-shots, gives images very transparent in the densest portions. Amidol acts similarly. Pyrogallop behaves with the 'intensive' much as with other plates, except that it gives a yellow stain which disappears in the fixing bath.

"But the properties of the plate are most notable when it is developed with slow developers of the hydroquinone-carbonate type, the image appearing quickly, and good results being obtained with five or six times the correct exposure without any alteration of the developer. In cases of gross over-exposure or of under-exposure, the developer is to be suitably modified. It is not claimed for the commercial 'intensive' plate that it can resist the extraordinary excess of exposure possible to a plate treated with oxidised amidol only. It has been made to give, when treated with a suitable developer, equally good results, in the three cases, of considerable under and over-exposure and correct exposure."

It is not the easiest thing to account for the behaviour of the plate described above. Take the case of the amidol-treated plate. The effect, whatever it is, is due to the action of the amidol in the film on the developer, for the results are observed whether the plate be treated before or after exposure to light. Hence the solution of the question is to be looked for in the altered condition of the film, subjected to the developer's action.

There seems no reason to suppose that the retarding action of the oxi-amidol is to be ascribed to any chemical action of the latter upon the latent image. Although an "oxi" compound, oxidised amidol is most probably quite incapable of supplying oxygen to the sub-chloride or oxi-chloride forming the latent image. A more reasonable explanation lies in the physical or chemical effect of the oxi-amidol on the action of the developer. Each molecule of light-affected haloid is surrounded by a protecting layer of oxi-amidol, which, besides opposing the entrance of the developer into the film by absorption, may behave towards the gelatine with which it is in congruity in the same way as many other oxidised developers, viz., harden it. When the developer is applied, the reduced silver forms a loose combination with the oxidised developer by which it is surrounded, a kind of simultaneous intensification and development taking place and producing an image which is largely made up of organic stain. In parts containing less light-affected compound, the addition of colouring matters will be less, and that not fixed by the reduced silver is removed from the plate on fixation; or, possibly, the reduced silver has a

chemical action on the oxi-amidol, producing an insoluble compound in part forming the image.

Some such action as the above would seem to take place, although it does not completely account for the behaviour of the plates.

The second process, resulting in what may likewise be called an "automatic" plate, was described not long ago by Professor Francis E. Nipher before the Academy of Sciences of St. Louis. Professor Nipher had found that a plate which, from over-exposure, gave no image on development, developed as a positive when development took place in the light. "Since then," we quote a more recent communication in *Nature*, "the same results have been obtained by first opening up the plate-holder and exposing the film to the lamp-light until it is all converted into the zero condition. If covered with an opaque punched stencil, no trace of the design will appear on the film when developed in the illuminated bath. The slide is then closed, and the plate afterwards exposed on the camera in the usual way. Such a plate cannot be over-exposed in any reasonable time. It may be exposed for a minute or for four hours to a most brilliant landscape, and the most superb results can be obtained. There is no restraining developer needed. The tendency to fog when the exposure is too short is corrected by taking the developing bath nearer to the light."

These results, which are at present quite in the embryo stage, offer particularly enticing inducements to the experimenters among our readers, to whose notice we submit Professor Nipher's results with the remark that the subject is one which can be undertaken by any one who has the simplest photographic installation, and that much interesting information is likely to proceed from a series of carefully made and explicitly recorded experiments.

Uranium Salts Sensitive to Light.—There is a fascination about the study of uranium, which tends to increase rather than lessen, accentuated too, as it has been of late years, by the discovery of the Becquerel rays in connexion with this metal, its salts, and those of the alleged new metals accompanying it. The Bulletin of the French Chemical Society recently contained a further addition to our knowledge of this metal in connexion with light action. The writer, M. J. Aloy, refers to experiments by Elbemen, who discovered that, on the exposure of an aqueous solution of uranic oxalate to sunlight, decomposition took place, resulting in the deposition of a flocculent precipitate of a violet-brown colour. M. Aloy varied this experiment by using other more soluble salts of this metal, and found especial success with the acetate. The light action on aqueous solutions was slow, but became rapid upon the addition of certain organic substances, particularly alcohol and ether. An aqueous solution of the acetate, exposed to sunlight, gave in a few minutes a very abundant violet precipitate. A solution of the same salt in alcohol gave similar results. After washing with water the deposit contained no acetic acid whatever. It is a hydrate described by M. Aloy as a hydrated uranoso-uranic oxide, amorphous and flocculent. It would be, of course, premature and useless to predict, but there seems undoubtedly here sufficient matter for consideration as to whether we have not in M. Aloy's work the germs of a photographic process, capable of useful elaboration to produce a real "uranium process."

Meteorological Forecasts.—It has been the fashion in some quarters to ridicule the weather forecasts issued in this country, in utter disregard of the fact that, owing to the diversified surface conditions of our land, an immense number of stations is

needed to enable local conditions to be taken into account; the presence, e.g., of hills, flat marsh lands, elevated plateaus, &c., all tend to affect a general prediction, but that there is a larger percentage of correct results given of late than was formerly the case cannot be gainsaid. The scientific observers at the head of the British Meteorological Service cannot be surpassed for ability by those of any other country; but it is possible to have greater facilities than we enjoy, and to that cause may be put down the great success of the Japanese in their meteorological work. From the accounts published it would appear that a photographer there, setting out for a day with the camera, could obtain beforehand a very reliable forecast of the weather he would experience, for, from a pamphlet published by the Tokio Observatory, for presentation to the Paris Exhibition, upon their service we learn that the forecasts have an average success of 82 per cent. The observations, made three times daily, are published in their weather reports, together with forecasts for the following day. They have eighty stations of the first and second order, and about 900 at which rainfall or temperature only is recorded. To give some idea of the extent of the data they obtain, it may be mentioned that all vessels of over 100 tons' burden, either in the imperial or merchant service, are compelled to make observations six times daily, and the logs are forwarded to the central observatory, the staff and attendants of which number fifty-three.

Balloon Photography in the Far East.—On Saturday last a mounted balloon section of the Royal Engineers, comprising three officers and seventy-five rank and file, left the Royal Albert Docks on the P. and O. liner, *Bombay*, for China. They took with them a large quantity of material and appliances, including apparatus and retorts for the manufacture of gas in the field, and fully equipped outfits for repairs—a very necessary precaution. Lieutenant-Colonel Macdonald was in command, the other officers being Captain Hume and Lieutenant Leake. Very complete photographic apparatus was taken, it is scarcely necessary to say, and we hear from good authority that most of the lenses were the Stigmatic. There was also a camera, with a rigid body some three feet long, fitted with a portrait lens of three and a half inches in diameter, with a Dallmeyer tele-photo attachment. We are not sure if a lens and tele-photo attachment of this size have been used before for war purposes. It was the late Mr. W. B. Woodbury who did so much for the advancement of photography, if we mistake not, who first suggested and demonstrated the advantages of balloon photography on the battlefield.

Rontgen Rays from a Twenty-thousand Cell Storage Battery.—The high storage necessary for producing the X rays is, as is well known, usually obtained by the intervention of a coil, the primary current being produced either by a comparatively few volts, from primary cells, or from a Wimshurst or other similar machine, but Professor John Trowbridge has recently described, at a meeting of the American Academy of Sciences and Art at Harvard University, the results he has been able to attain with a series of twenty thousand Planté cells. These gave a voltage of forty-two thousand, and, when Leyden jars were used, three million. He easily obtained discharges six or seven feet in length. They closely resembled lightning, and with them he was able to reproduce all the photographic effects obtained by students of the natural phenomenon. The part of his lecture most interesting to photographers is that we have here a new source of X rays. "All the methods now in use," he states, "give a light which is far from constant, the rays are of unequal strength, or, when equal, are generally alternating in character," the result being a shifting radiant print and imperfect definition. With this immense battery traces of the rays were produced with a steady current of five thousand volts, they are strongly produced with twenty thousand. A steady current at forty thousand, the exhibition of rays is surprising, a fluorescent screen is lighted with extreme brilliancy, and marvellous shadows of bones of the hand are obtained. "In my experiments I was surprised at the small amount of current necessary, with a voltage of forty thousand to produce a strong

development of X rays. The use of ten milliamperes was dangerous to the tube; the anode grew white hot, and the Crookes tube resembled an arc lamp." Professor Trowbridge regulates the strength of his current to any degree of nicety with a liquid resistance. He says "it seems possible, by carefully regulating the strength of the current and the voltage, to obtain photographs of the tendons, and probably the muscles, for the photographs which I have already obtained show great contrasts, and there are indications of muscular layers and tendons. The contrast between the bones and the flesh is remarkable, much greater than the pictures, usually obtained by the Ruhmdorf coil."

JOTTINGS.

BEING what Miss Fanny Squeers, I believe, termed a "human man," I am not displeased at reading that the remarks I made on June 22 relative to the absurd things done in the name of pictorial photography by some American amateurs have earned the approval of many of my *confrères* on the other side of the Atlantic. The editor of the *Camera* says: "Our English cousin 'Cosmos' refers particularly to those gentlemen of the *dizzygraph* school resting on a slender pedestal in a way that we like, and particularly hits several over-rated amateurs in a proper manner. The article voices our sentiments completely. Whilst the persons referred to in the article certainly have done much talking, it must be remembered that we have many artistic photographers in America—numbers of them; but they are modest, their work speaks for them." The *Photo-Beacon* quotes what I wrote in an article headed "An Imported Epidemic." The ably conducted *Photo-Miniature* also quotes me; calls me caustic; says I have become infected with the anti-American fever; and winds up by apostrophising me as "venerable." Now, now, friends, it is not so. I call as a witness the enlightened Mr. John Beeby, of the New York Camera Club, with whom I had a long and agreeable chat on American photography only this very week. He will arrive in New York at the same time as this number of the JOURNAL, and, if he says I am caustic, anti-American, and venerable, I must really cross over and demonstrate the contrary.

THIS matter of forcing the lens, the dry plate, and the printing paper to produce results which even an imbecile would not mistake for photographs in the expectation that common-sense persons will accept them as necessarily pictorial is no new theme for my pen. For years I denounced the absurdity of the business. Here it has long since died the death, of course; but I remember the temporary indignation of a friend who objected to my description of one of his modish exhibits as "a high light and a smudge." Years afterwards he justified me by admitting that I was right. Refusal to bow down and worship astigmatic blurs and other kinds of flat and fuzzy abominations brought me by way of reward such polite references as "a bitter foe," "an implacable enemy" of—pictorial photography! Strange! The walls of my room, in which I am writing, are fairly well covered with photographs by, amongst others, James Craig Annan, H. Walter Barnett, William Crooke, George Davison, Robert Demachy, Dr. P. H. Emerson, Frederick H. Evans, Frederick Hollyer, Captain Puyo, Alfred Stieglitz, and Herr Watzek. If appreciation of these men's work is a mark of invincible opposition to pictorial photography, I suppose I am past praying for. In the States, the journalists who are rightly discounting the bad photography and the nonsensical twaddle that is written about it by Mr. Hartmann and other windbags are coming in for the same sort of mud-throwing to which I was subjected. Only men really great in their avocations or professions can successfully stand against continued ridicule. I know no photo-faker who is not, intellectually, a very small person indeed, and for whose "mind diseased" a little wholesome scorn is the best medicine that can be prescribed.

THE essential parts of the Platinotype Company's specification for the excellent oximagnesium lamp which has been in use for some time are published on another page. This lamp is certainly one of

the most convenient things that has lately been brought to the notice of photographers. For £1. a perfectly efficient system of artificial lighting for the studio is available, and the apparatus is so portable that the whole of it, battery, gas-holder, stand, the "bell jar" of oxygen, and the reflector may be easily stowed away in a corner. In a few weeks from now the shortening autumn days will revive interest in artificial light portraiture. I can certainly recommend this lamp to the notice of my professional readers, who may then wish to make themselves independent of daylight at not too high a price. From the sitter's point of view, I believe that nothing could be more agreeable than this plan of electrically igniting magnesium strands in oxygen. I have "sat" to the light several times, and must compliment it on its behaviour, which is so good and gentle that the most nervous sitter could scarcely be startled by it. While the exposure is being made, one is conscious of a gradual glow of light, and so soon as it attains its maximum brilliancy it just as gradually fades away. There is no noise or sputtering, the direct source of illumination need not strike the eyes, and altogether I think that those photographers who take up the lamp for studio portraiture will find their sitters appreciate it.

THOSE who take the side of "actuality" against "art" in the fight between photography and hand drawings for pride of place in the illustrated papers will enjoy the following paragraph. It is taken from the *Scientific American*, a paper of the highest standing, which long held out against the use of photographic illustrations in its pages. Nowadays a very considerable number of its blocks are made from photographs. "The vagaries of American journalism" is a favourite theme with the Transatlantic editor, especially at such times as, for want of a better topic, he must fall back upon his list of stock subjects for an inspiration. It is possible that now and then we, on this side of the water, do allow imagination to trespass upon the domain of fact, but never, surely, have we eclipsed the performance of our contemporary. In a representation of the scene of the Hoboken fire, published in one of the leading English illustrated weeklies, the Hudson River is shown to be spanned by two colossal bridges, one at Twenty-third and the other at Fifty-ninth Streets. Where the imagination of the artist received its stimulus we cannot tell—though we might hazard a guess—but certainly this view was not drawn 'upon the spot,' or even 'from a photograph.' The two structures exist only on paper." This is about as bad a case of erratic illustrating as I have come across, and yet there are complaints that many able black-and-white men cannot earn a living, as they have been displaced by photographers. All this looks as if the accuracy of the camera is preferred by the great reading public to the imaginative but misleading sketches of clever artists working in Fleet-street back offices or St. John's Wood studios. The fact of the matter is that photography is rapidly asserting itself as the only practicable method of illustrating weekly periodicals. The latest of these, the *Traveller*, which, I am told, has been two years in preparation, relies almost wholly upon phototypic illustrations—a very significant sign of the times indeed. In passing, may I suggest to the editor of this beautiful paper that a few photographs of home scenery would be welcome to his readers? Hitherto he has given us nothing but foreign views. It is really wonderful to see how strong to-day is the reliance of the illustrated press upon the once-despised photographer. A few more artists' drawings of rivers crossed by non-existent bridges, and hand drawings in topical weekly papers will cease to be tolerated by readers—and advertisers!

"PHOTOGRAPHS are too cheap," writes a friend in an interesting letter, and then he goes on to outline a suggestion with regard to portrait-making by photography which may be worth taking into consideration by some ambitious worker who is anxious to run a business on original lines. Briefly, my friend's idea is that it might pay a good man to devote himself entirely to the production of life-size, or at any rate large, portraiture, supplying only the one print and destroying the negative. He adds the further suggestion that a sitter having secured a satisfactory or pleasing portrait might be induced to agree to its reproduction in photogravure, and, if the

plate as well as the negative and transparency were destroyed after a limited number of good impressions had been pulled, the impossibility of obtaining direct reproductions from the original negative would send up the value, intrinsic and esteemed, of the photogravure. What my friend has in mind is that the photograph might be made in this respect something like the limited engraving, the oil painting, or the water-colour drawing, that is, appreciated in the inverse proportion to its rarity. Practically he would return to the Daguerrean order of things, where the sitter was given what he sat for, a single, unreplicable picture of himself. The photographer then did not retain possession of a negative, for no negative was taken, of course. My friend's idea, which, he may be assured, is not wholly original (originality nowadays is rather scarce, my brothers), if generally adopted, would obviously have an effect upon commercial photography the reverse of stimulating, and it is one, of course, which only a photographer of great originality and ability dare think of. Something of the kind is already done by two men of my acquaintance, but more as an exception than a rule. The suggestion is that it should be made the rule and not an exception.

THE prospects of a well-filled and successful Exhibition of the Royal Photographic Society at the New Gallery are exceedingly bright. It has already been stated that the whole of the space in the Apparatus Section has been taken. In the General Professional Section such firms as Messrs. Morgan & Kidd, the London Stereoscopic Company, the Autotype Company, and others, have booked spaces of thirty feet "run" and more. Mr. W. Crooke, the renowned portrait photographer, will cover a wall space of thirty-three feet with a collection of his admired work. Mr. James A. Sinclair, who has been travelling in Spain, will, of course, send in; so too, I believe, will another great photographic traveller, Mr. John Bushby, of Penrith. New York will, it is hoped, be represented by Mr. John Beeby, whose work is ready. That very earnest photographer, Mr. T. C. Turner, of Hull, will, I am told, submit a large collection of recent work. These are only a few of the names that occur to me while I am writing. From what I heard, I might give a list of intending exhibitors that would fill this page. It is needless to do so. The point is that the first Exhibition at the New Gallery gives every promise of being truly representative of all phases of modern photography. Two or three correspondents have directed my notice to the fact that the composition of the Selecting Committee has been adversely criticised. The source of the criticism removes all necessity for paying the least attention to it; but, for the benefit of intending exhibitors at the New Gallery, it may be stated that the Selection Committee is chosen by a responsible executive of twenty-eight gentlemen, which, in its turn, derives its authority from an elective body of over seven hundred photographers. Here is the Committee: Rev. Mr. Lambert, Mr. W. Thomas, Mr. J. A. Sinclair, Mr. J. C. S. Mummery, Mr. H. Vivian Hyde, and Mr. Mackie. The first two gentlemen are regarded by the complaining person (and others) as authorities on pictorial photography; Thomas, Sinclair, and Mummery, in addition to other qualifications, have won the Society's medal; Hyde is a distinctly cultivated pictorial photographer, who has frequently exhibited by invitation at home and abroad as well as at Pall Mall; while, if I were asked to name a photographer more experienced or more capable in the selecting, hanging, and organizing work of an exhibition, I should not look beyond Mr. Mackie. The Selecting Committee is possibly not an ideal one, but it is less open to objection from any standpoint than some other exhibition executives and judicial bodies which might be named.

A YEAR ago I wondered what an American "clambake" was like, and one or two friends in the States sent me the recipe. Apparently it is a vast dish of fish, flesh, and fowl. Now, my *confrère*, Mr. John A. Tennant, writes: "You desired to know about the clambake. Here it is." The "it" consists of three photographs of the National Association of Photo-engravers, in one of which the members are shown seated at a very substantial meal. My thanks to Mr. Tennant. One of these days I hope to eat clambake at an American Convention; I shall not be happy till I do. Meantime, in default of being able to make Mr. Tennant's mouth water with a photograph of an English delicacy as fascinating and complicated

as a clambake must be, I am happy to congratulate him on that capable effort of photographic book-making, the *Photo-Miniature*. Fifteen numbers, each complete in itself, are before me, and the subjects dealt with are as follows: 1, Modern Lenses; 2, The Pose in Portraiture; 3, Hand-camera Work; 4, Photography Outdoors; 5, Stereoscopic Photography; 6, Orthochromatic Photography; 7, Platinotype Processes; 8, Photography at Home; 9, Lantern Slides; 10, The "Blue Print," &c.; 11, Developers and Development; 12, Retouching Negatives, &c.; 13, Photographing Flowers and Trees; 14, Street Photography; 15, Bromide Printing. The series is admirably done. Each subject is intelligently and fully treated, and, if I wanted to make a present to a young photographer, the bound volumes of the *Photo-Miniature*—an original and successful departure in modern photographic journalism—would be found on my list to select from.

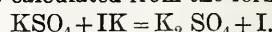
Cosmos.

FOREIGN NEWS AND NOTES.

Sensitiveness of Dry Plates to Invisible Radiation.

—Professor R. Namias, in writing upon this subject in his paper, *Il Progresso Fotografico*, mentions a very interesting experiment made by Gustave Lebon. A statuette was covered with calcium monosulphide and exposed to sunlight for some time. It was then kept in the dark for several hours until all trace of luminosity had disappeared. A dry plate was then placed near the statuette, and upon development gave an image formed by the statuette. The writer holds that, after visible luminosity has ceased, rays are emitted by calcium monosulphide which affect the photographic dry plate. But, more strangely still, these rays appear to be emitted for an indefinite length of time. After the statuette had been kept in absolute darkness for eighteen months, the same action was observable upon exposure of a dry plate in proximity to the statuette. It therefore seems to be an established fact that, after visible radiations have ceased, rays are still emitted by calcium monosulphide, to which silver bromide is sensitive. These rays appear to be analogous to those emitted by uranium, thorium, polonium, and radium.

Testing Persulphate.—In the *Chemiker Zeitung* Mondolfo gives the following test: Two to three grammes of the persulphate are dissolved in 100 c.c. of water. Warm 10 c.c. of the solution with $\frac{1}{4}$ to $\frac{1}{2}$ gramme of iodide of potassium in a stoppered bottle for about ten minutes, raising the temperature to about 60° to 80° C. Iodine is liberated. Add a few drops of boiled starch, which will be immediately turned blue, and then from a burette of normal ten per cent. solution of thiosulphate of soda add sufficient solution, drop by drop, until the blue colour is discharged. The percentage of persulphate may then be calculated from the formula—



127 parts of iodine liberated will be equal to 135 parts of persulphate. In this way 1 c.c. of ten per cent. solution of normal thiosulphate of soda is equal to 0.0135 gramme of persulphate of potash, or 0.0114 grammes of persulphate of ammonium.

Intensification.—The *Photographische Chronik* gives the following table of the comparative effect of various methods of intensification compiled by P. Von Jankó.

Bleaching Solution.	Intensifying Solution.	Rates of Intensification.
Bromide of Copper	Metol	15 : 14
"	Hydroquinone	15 : 13
"	Pyrogallop	15 : 12
"	Nitrate of silver	15 : 8
—	Iodide of mercury	15 : 10
Bichloride of Mercury ..	Sulphite of soda	15 : 14
"	Oxalate of iron	15 : 13
"	Hydroquinone	15 : 12
"	Hyposulphite of soda, or ammonium	15 : 11
"	Ammonia	15 : 10
"	Ammonia, the plate being dried after bleaching..	15 : 8½
"	Ammonium sulphide....	15 : 7
—	Uranium	15 : 6

From this it appears that mercury and ammonium sulphide, and the process of intensification with uranium give the most contrast, which is also the experience of photographers.

Incandescent Burners.—The *Photographisches Wochentblatt* gives an extract concerning incandescent mantles formed of woven wire. Hitherto they have not been a success owing to their liability to melt before the maximum illuminating power is reached. Emil Ferbecke, of Brussels, has invented a process, in which the warp and woof of the mantle are formed of different metals or alloys, with very high, but different melting points. The advantage is, that the temperature may be raised almost to the melting point of one metal, whilst the other metal remains sufficiently rigid to act as a support. The following alloys have been found very serviceable. For the warp: 88 parts of platinum, 10 parts of iridium, 2 parts of rhodium; for the woof: 90 parts of platinum, 5 parts of iridium, 2 parts of rhodium and 3 parts of palladium. The second has the lower melting point.

Photo-mechanical Work in Germany and its Remuneration.—The *Photographische Chronik* has a very interesting article upon this subject, from which we tabulate the following particulars concerning the hours of work, wages, &c.:

	Berlin.	Leipzig.	Munich.	Stuttgart.	Nuremberg.	Dresden.
Number of Firms	19	12	6	8	2	3
Number of Workmen	295	217	212	82	18	29
Number of Apprentices	59	38	25	17	3	2
Number of Assistants	55	20	39	6	2	2
Hours work per week ...	46½ to 51.	48 to 54½.	48 to 51.	48	48 to 54.	48 to 54.
Wages:—	Average 50.	Average 53.	Average 48½.		Average 50½.	Average 51½.
Photographers	35 marks.	34½ marks.	40 marks.	38 marks.	32½ marks.	— marks.
Printers ...	30 "	26½ "	37 "	21 "	22½ "	35 "
Etchers	32½ "	29½ "	31 "	34 "	27 "	28 "
Retouchers	31½ "	25 "	27 "	23 "	22 "	32 "
Engravers...	33 "	28½ "	33 "	33 "	30 "	30 "
Press-hands & Mounters	26½ "	25 "	27 "	28 "	—	20
Assistants ...	18 "	17 "	19½ "	—	—	—

In nearly every establishment the workmen receive pay for holidays, and in Berlin it is customary to give fourteen days' notice. In Berlin extra pay, ranging from ten to fifty per cent., is given for overtime. In Stuttgart overtime is paid twenty-five per cent. extra till eight o'clock in the evening, thirty-three and one-third per cent. till ten, and fifty per cent. after ten and on Sundays.

Heat-resisting Lubricants.—The *Moniteur de la Photographie* recommends the incorporation of sulphur with lubricants, it being a bad conductor of heat. Take 100 kilogrammes of best colza oil, add five kilogrammes of sulphur, and heat it to at least 130° to 140° C. In about an hour the whole of the sulphur will have been taken up, and it will remain in solution and not impair the lubricating quality of the oil. The sulphur prevents heating, and consequently adds to the serviceableness of the lubricant.

The Ventilation of Laboratories and Dark Rooms.—The *Photographisches Wochentblatt* gives the following test for the purity of the air in dark rooms and laboratories upon the authority of Lebedeff, quoted from the *Chemiker Zeitung*. The usual test hitherto has been merely for the quantity of carbon dioxide present, but it is very important to check the quantity of organic impurities thrown off by the skin and lungs, which likewise contaminate the atmosphere. Lebedeff estimates the quantity of these impurities by the volume of oxygen necessary for their destruction. A test solution is made by dissolving 0·036 grammes of permanganate of potash in a litre of water, to which 100 c. c. of dilute sulphuric acid (1:3) has been added. A solution of oxalic acid, 0·063 grammes per litre of water, is used as reagent. The strength of this solution is just sufficient to discharge the colour of an equal quantity of the permanganate solution. To determine the quantity of organic impurities present, pass a measured quantity of the air through 100 c. c. of the permanganate solution. If the air is pure, the solution will remain unaffected, and 100 c. c. of the solution of oxalic acid will be required to discharge the colour. But, if the permanganate has been deprived of any of its oxygen by organic impurities in the air, less than 100 c. c. of the solution of oxalic acid will be needed to discharge the colour, and the difference is the measure of the impurity. For example, if 90 c. c. of oxalic acid solution are used, 0·08 milli-

gramme of oxygen will have been wanting, since 1 c.c. of permanganate solution gives off 0·008 mgrm. of oxygen. The following results have been obtained from practical experience, and represent the loss of oxygen: In the open air, 0·078 mgrm.; in an unoccupied laboratory, 1·075 mgrm.; in a laboratory in use, 3·628 mgrm.; in a workman's dwelling, 8·625 mgrm.

STRENGTHENING ALCOHOL.

A FEW weeks back we answered a correspondent with reference to the strengthening of methylated spirit and the cost of a licence to use a still. In the reply we intimated that it was illegal to tamper with methylated spirit. In a letter we inserted in the Correspondence column last week Mr. Stokoe calls attention to the well-known method of strengthening alcohol by shaking it up with carbonate of potash to absorb the water, and mentioning that this treatment would not be infringing the law. We do not think it would, though it would not answer our correspondent's purpose. He wanted (we did not insert the query in full) a spirit much stronger than the commercial article, in fact, absolute alcohol. At one time methylated absolute alcohol was allowed to be sold; now it is not.

The methylated spirit as supplied by the methylators is generally from 62 to 64 over proof; we have had it stronger than that occasionally. The samples we have obtained from the oilshops have not been much weaker than that. Now, alcohol (64 over proof) has a specific gravity, approximately, of ·820. If alcohol of that strength be treated with carbonate of potash, its strength will not be materially improved; indeed, if the carbonate of potash is not thoroughly dried beforehand, it may be weakened by the treatment. If we wish to get alcohol much stronger than about ·820, we must resort to chloride of calcium, or quicklime, and distillation; then it may be obtained with a specific gravity of ·794. It is then absolute alcohol, but it is difficult to retain it as such. The commercial absolute alcohol has a specific gravity of ·805, and that strength (of the methylated kind) was at one time permitted to be sold. Unless spirit strengthened by carbonate of potash is distilled, it will be alkaline, by reason of some of the carbonate of potash being retained in solution by the water present—nearly ten per cent. With spirit that is weaker than that referred to (the commercial), it can be materially strengthened by the carbonate of potash treatment. For example, spirit that has been used for drying negatives, or weakened by similar uses, can be brought up to its original strength with the carbonate of potash. Whenever this salt is used for the purpose, it should be thoroughly dried beforehand. A good way of doing that is to put it in an old frying-pan and make it thoroughly hot over the fire, and then put it, while still hot, direct into the spirit. We have not thought it necessary to take into consideration the slight difference in the specific gravity of alcohol and wood naphtha in these notes, as they make no practical difference in the figures we have given.

OUR NATIONAL PORTRAIT GALLERY—AND A SUGGESTION.

THE Trustees of the National Portrait Gallery have just issued their report for the year ending March 31 last. From it is seen that the Gallery was visited from January 1 to December 31, 1899, by 122,167 persons, made up as follows: free of charge, 103,248; on payment of sixpence, 7080; on Sunday afternoons, 11,839. It would be interesting to know how many professional photographers figured amongst these numbers who went there to study portraiture. Those who did, no doubt saw much to avoid, as well as much to copy, in the way of posing and lighting. The National Portrait Gallery is much handicapped in the matter of funds, and for that reason it was unable to acquire several portraits that would be of national interest. 750l. a year is all that is allowed by the Treasury for the purchase of fresh pictures. Seeing that the object of a National Portrait Gallery is to present portraits of national interest, why should not photography be recognised? There are thousands of persons who have distinguished themselves in warfare, literature, arts and sciences, &c., who have never had an oil painting of themselves, or, if they have their families prize it too highly to present it to the nation. Yet their portraits would be of great interest in a national collection, though they could not be shown but for photography, either in the form of reproductions from the family portraits—paintings—or photographs from life. We know that many photographers who hold negatives of persons of great national interest would be only too pleased, with the sanction of their friends, to present enlargements of them to the nation, if there were a place for their reception and exhibition.

Of course such portraits would be produced by a permanent method, such as the carbon or the platinotype process. We now have a National Photographic Record Association, that is collecting photographs of ancient buildings and places of interest before they disappear, which find a place in the British Museum. Why should not a similar thing be done with regard to portraits of individuals who have distinguished themselves in their country's advancement? Setting aside the portraits of immediate national interest, why should not the Royal Photographic Society, now that it has a home of its own, have a complete collection of portraits of those who have, by their discoveries and researches, brought photography to its present state of perfection? Photography is still young, though we are sorry to say that many who, by their researches and discoveries, have advanced it so greatly, have passed away, and we now know them only in name; but a gallery of their portraits at the Royal would be valuable, particularly to after-generations. Portraits of all of them are, doubtless, to be had now, but they may not be a few generations hence.

A PLEA FOR SLOW PLATES.

To the pages of the *Photo-American* Mr. Charles Thael contributes the following notes of advice on the use of slow plates for summer work:—

"The slow plate fogs but rarely under all reasonable treatment; chemical fog is practically unknown on it, and the body is better—that is, there is more to work on than upon the extra-rapid ones. As for developing them, slow plates develop incomparably easier than the fast ones when properly exposed, and are not slow in doing it either; they start right, keep gathering good, honest density after the detail is out, and do not fix out weak. They are *certain* to give the best results when their use is permissible. Of course, they are not suitable for races, express trains, or rifle balls; they are far out of the race on that class of work, but how few of my readers do much of that kind, and how easy it would be, when they want to do such things, to buy a dozen extra-rapid plates and use them. Ask the plate-maker which are his best plates, and, if he be frank, he will say, 'the slow ones.'

"Now let us consider what of the summer's work can be done on slow plates. Outdoor portraiture can certainly, and for this branch the slow plate is eminently suitable—just an open and shut of the shutter, say a half a second's exposure, and the portrait is sure to be about right. There is no under-timing, no over-timing apparently; it develops neatly, acts rationally, needs no sudden change in the make-up of the developer, but just *satisfies* one as it plods along, behaving normally in all respects, and when fixed and dried what an excellent printer it does make, crisp and bountiful in detail. One never has the amount of trouble dodging and doctoring slow-plate negatives as with fast ones. Then, for the innumerable landscapes that will be taken this year, what could approach the slow plate? I venture to say that if two novices went to the country, one with a gross of fast plates and instructions to 'press the button,' the other with a like amount of slow ones and directions to give three to five seconds with stop 32 in the lens, the latter would have eight times as many good negatives as the former, and a vastly greater average of perfect ones.

"It has always seemed a pity to me that film for Kodaks is not to be had slower than the admirable fast emulsion supplied; the fast film is certainly right in its place, but slow film is as much a necessity as slow plates. When a country road, a noble oak, an old cottage, and a sleepy cow happen to be the principal components of an artistic picture, it will readily be understood that an exposure of a one-hundredth of a second is as unnecessary as it would be for a graveyard, and, if one can secure a far better negative with slow plates and the tripod, it is our business to do so. One who takes a day's trip out in the fields can well afford to carry *some* fast plates, but, if best results at least expenditure of time and trouble are desired after the actual taking of the picture is concluded, let me strongly urge all to carry the majority of their holders full of slow plates. It will pay all who entertain any doubts as to the wisdom of my remarks to actually make the test and be convinced. Once a few such plates are developed, and the comparative ease of so doing is noted, and the bright negative printed, all doubts as to the advantage of using slow plates when possible will vanish, and the word failure will begin to sound unfamiliar to the successful user of the best plate for outdoor work. In the course of the summer I shall use perhaps two gross of plates of various sizes, and, as much of my work will be outdoors, I figure that four dozen fast plates will be the very most I will require. I run far less chance of failure, have incomparably easier work in all respects, and produce a more satisfactory negative in every

way, shape and manner, with slow plates. I believe the best slow-plate negatives, minutely examined, point for point, will be found superior to the best fast-plate negative ever made, presupposing, of course, that each was sufficiently and properly exposed. It would cost some of my readers very little trouble to investigate this matter, and, if twelve good negatives to the dozen, after summer's work, is any incentive, I can say that such a percentage is not improbable. Those having experience with fast plates might reckon up what percentage of success they had last year, and think the matter over."

THE PRESERVATION AND USE OF GELATINE ROLLERS.

[Translated from the *Photographische Chronik*.]

THOSE who know how difficult it is to cast good, durable rollers, and how expensive it is to replace them, will appreciate the following instructions given by H. Gauger, manufacturer of printer's inks.

1. The rollers should be kept in a dry place at a uniform, moderate temperature.
2. The rollers should be cast from uniform material, and, if possible, in the autumn (September to October) for winter use, and in the spring (April to May) for summer use.
3. Inking rollers should only be cast or recast from fresh material, and should be allowed to stand a few days before use, to season.
4. Old composition should only be employed for casting rollers that are not used for inking blocks, writing, &c.
5. In recasting old rollers, they should be first washed clean and the skin removed with hot water. The ends, and all cuts and holes, in which ink may have lodged, should be removed with a sharp knife. The composition should then be stripped off the spindle, broken in small pieces, and thrown in the melting pot.
6. The receptacle in which the composition is dissolved should not be heated by steam, but in a hot-water jacket, otherwise the composition may be over-heated and spoilt.
7. The mould should be warmed, especially at the bottom, but it should not be hotter than the hand can bear. This may best be done with a handful of cotton-waste saturated with spirit, suspended by wire inside the mould, near the bottom, and burnt. When the mould is warm, smear it thinly and evenly with olive oil or fresh pork fat.
8. The spindle should be warmed before placing it in the mould, and it should be perfectly dry. Small iron spindles may be wound round with cotton thread, but in this case it is better to prepare them the previous day by fastening the thread to the spindle with Cologne glue.
9. When the composition is completely dissolved and fluid (the temperature should never exceed 60° C.), the mould should be filled in a place free from draught, by pouring the composition gently down the spindle, making occasional pauses of two to three minutes each. When the mould is full, set it up near the fire to allow any bubbles to rise.
10. The mould should be allowed to cool down gently for about eight to ten hours and the roller may then be withdrawn. It should be cleaned with a sponge dipped in benzine to remove the grease, and should not be used for a couple of days.
11. No admixture (crème) should be added to the composition taken from old hard rollers, unless softer rollers are required for winter use, and then the proportion should not exceed ten per cent.
12. The reserve set of rollers should be kept in a cupboard to preserve them from draught and dust.
13. In damp localities, or in damp weather, the rollers should be covered with a coating of very thin newspaper ink (old, bad ink, mixed with lubricating oil), which should be removed before use. This prevents swelling or shrinkage.
14. The washing of rollers should be carefully avoided. If, however, it must be done to change the colour of the ink, first clean the rollers with waste paper, then with petroleum, and finally with benzine.

A SIMPLE METHOD OF OBTAINING THE CONJUGATE DISTANCES OF A LENS.

[A paper read before the Royal Photographic Society.]

THE practical photographer occasionally has need to know the conjugates of a lens when these are in a given ratio. For this end various useful formulæ and tables have been published, but these are not always easy to remember at a moment's notice.

The method I propose showing has the advantage of eliminating formulæ, is easy to remember, avoids calculation, and only needs the use

of a graduated linear measure and any convenient form of parallel ruler. For example, our apparatus may conveniently take the form of a sheet of cartridge paper, a penny tape measure, a broom-stick, and two or three pins.

The method consists in applying two elementary principles of plane geometry which have been known to the world since the days of Euclid (*circa* 300 B.C.), and are therefore old enough to have been forgotten by many. I may therefore perhaps be pardoned if I remind you of these two old-world facts.

In fig. 1. A B and A C are two straight lines meeting at right angles at A. The angle BAC is bisected by the line AD. A straight line G F H meets these three lines at the points G, H, and F respectively.

Then, if FE, the perpendicular distance of F from A B, represent the equivalent focus of a lens, its conjugate distances would be represented

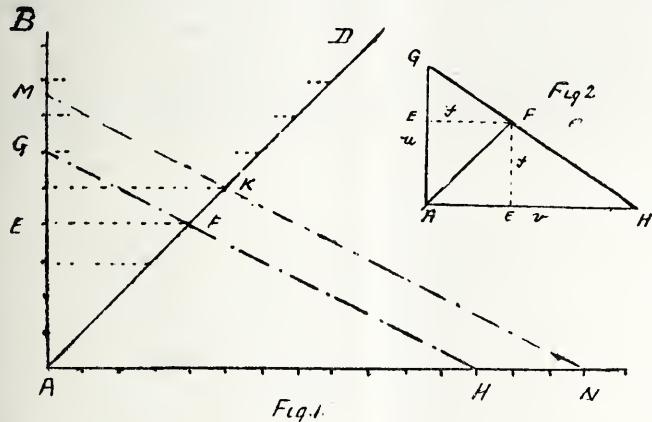


Fig. 1.

by the lines A G, A H. It may be an aid to memory to briefly glance at the reason of this. (See fig. 2.) Let us for brevity's sake call f the perpendicular distance of F from A G or A H and A G = u , A H = v .

Now, the whole triangle, A GH = the two smaller triangles A FG, A FH, and the area of a triangle may be expressed by half the product of the base and altitude. Hence, taking all these double to avoid fractions,

$$\begin{aligned} A G \times A H &= A G \times F E + A H \times F E. \\ u v &= u f + v f. \end{aligned}$$

Dividing by uvf we get

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

which we recognise as a fundamental formula.

Secondly.—Another ancient bit of Euclid tells us that, if the line G H move parallel to itself, the ratios of A G, A F, A H, remain constant. Or, in the language of modern geometry, we may call A B, A C, A D, three concurrent rays of a flat pencil and G F H a transversal moving parallel to itself.

And now to apply these fragments to the needs of the practical photographer.

Suppose that A B and A C be marked in inches and that A D be similarly graduated by E F, &c., parallel to A C.

First take the case of a 4-inch lens used for enlarging to the scale 2 to 1. We know that one conjugate must be double the other. In other words, the distance A H (fig. 2) must be double the distance A G. Therefore we place our parallel ruler so as to cut A B and A C at any two such points, say the third mark from A along A B and the sixth mark from A along A C. Then move it parallel to itself until the fourth mark (F) along A D is coincident, and now read off the distances A G and A H. In this case they are at the 6 and 12-inch mark exactly.

Thus $\frac{1}{6} + \frac{1}{12} = \frac{1}{4}$, or, expressing all as twelfths,

$$\frac{2}{12} + \frac{1}{12} = \frac{3}{12}$$

If now we move G H parallel to itself until we reach the mark K, corresponding to a 5-inch-focus lens, we find our conjugates A M and A N at $7\frac{1}{2}$ and 15 inches.

But the more useful applications are, when we want to know conjugates of less simple relationship than 2 to 1. For instance, enlarging from quarter-plate (say 4×3) to 15×12 . Now, four times 4×3 is 16×12 , but our limits are 15×12 , i.e., proportions 4 to 15. Thus, placing our ruler at the 4-inch mark along A B and the 15-inch mark along A C, we can, by moving it parallel to itself, read off conjugates for any lens marked along A D.

THREE-COLOUR PRINTING.

ARISING out of the reference to three-colour printing recently made by a writer in the *Daily Chronicle*, the following correspondence has since appeared in that Journal. The Editor of the *Studio* writes: "In his tiltings at colour printing in general, the writer, under the heading of 'The Art World,' in the issue of the *Daily Chronicle* for the 6th inst., allows himself to fall into the error of classing the colour reproductions in the *Studio* with the imperfect three-colour prints employed in American and other magazines. This is the second time in a short period that the writer in question has demonstrated his lack of discernment with regard to colour printing, and the misleading nature of his remarks compels me to beg permission to state that the colour reproductions in the *Studio* are not executed by the cheap 'three-colour process,' but by a very much more elaborate and expensive method that frequently involves the employment of a large number of blocks."

"With reference to the statement that 'reproductions in colour are always out of place in a well-printed book,' this is a subject upon which opinions may vary, but there can be no doubt about the advisability of employing a method of reproducing colour tints in dealing with coloured artistic work and introducing such work to the general public. A magazine may be regarded either as an artistic object in itself, or as a medium for disseminating intelligible information to its readers, and if a publication of the latter class—such as the *Studio*—has to do with coloured decorations and paintings, the quality of the work dealt with will be made more intelligible by means of colour prints than by reproductions in black and white. Moreover, if the exact reproduction of original colours is more feasible on a fine bright-faced paper than upon a coarse, dull one, it is obviously advisable to use the medium calculated to convey the best impression of the original drawing."

The rejoinder of the *Daily Chronicle* critic was as follows: "I did not say that the reproduction of Mr. Alexander's portrait in the *Studio* was done by the three-colour process. As to the rest of Mr. Holme's remarks about colour reproduction and printing, he seems to have misunderstood the *Art World*. I have always advocated the reproduction of specially prepared drawings in colour. Between the intelligent reproduction of such drawings, however, and the indiscriminate reproduction of oil paintings never intended for reproduction there is a vast and impassable gulf fixed."

Mr. R. B. Roxby also sent the following letter: "I read your notes in the *Daily Chronicle* of the 6th inst. with reference to colour printing, and also Mr. Holme's letter in to-day's issue. Whilst your observations with regard to the ordinary three-colour process are quite correct, and to a large extent are also applicable to lithography, I think that to reproduce pictures by a superimposed method is not quite so impossible as the current prints, which you rightly style vile, would lead one to suppose. I should be very glad for an opportunity to show you some three-colour prints, which I think would lead you to modify to a considerable extent your present opinion with regard to the possibilities of reproduction by the primary colours method. As to the prints referred to by Mr. Holme, they are certainly three-colour prints, or rather three-colour prints which are as far as possible improved by the interpolation of one, two, or more blocks printing a neutral or other tint. In a measure, therefore, Mr. Holme is quite correct in stating that they are not three-colour prints. Obviously they are not if more than three colours are used. At the same time the fact remains that fundamentally they are primary colour prints, made better by adding skilfully several neutral printings."

THE PLATINOTYPE COMPANY'S OXYMAGNESIUM LIGHT.

[Patent No. 22,747 of 1899.]

We append the essential portion of the Company's Patent Specification:— Various means have been proposed and employed for producing light for photographic purposes, for example, electric arc lamps, electric incandescent lamps, incandescent gas-burners, and lamps known as "flash lamps," in which metals or other substances are burned. All of these methods, however, as heretofore practised, have certain objectionable features. For instance, arc lamps are expensive and troublesome to manage; electric incandescent lamps are deficient in actinic rays; incandescent gas-burners, if made sufficiently powerful for studio work, develop too much heat; and flash lamps are dangerous by reason of their liability to set fire to inflammable objects near them, besides which they are objectionable because of the diffusion through the atmosphere of the studio or room of burnt and partially burnt products arising from such lamps.

Moreover, it is found in practice that an artificial light to be of any real value must be strong enough to allow of its being reflected from a suitable surface or filtered through a translucent screen, when necessary

for proper "lighting," upon the object to be photographed, instead of being thrown directly upon such object.

It is known that magnesium or other suitable metal burned in oxygen gives a satisfactory light for photographic purposes, the rays being very actinic and therefore adapted to be used, after reflection from or filtration through a screen, for illuminating the object to be photographed. The method heretofore used for producing such light is not, however, convenient for practical and repeated use, and the object of the present invention is to provide simple and easily manipulated and portable apparatus for burning magnesium and other suitable metals in oxygen in an unobjectionable manner and so as to form or give a sufficiently strong actinic light to be used where necessary by reflection or filtration.

An important feature of the invention is the provision of means for lighting the metal ribbon or wire by a current of electricity, ignition being ensured by means of paper, sulphur, wax, or other readily inflammable substance as hereinafter described.

Another important feature is the construction whereby the oxygen consumed during combustion is replaced automatically by fresh oxygen from a suitable source of supply.

A further feature of the invention is the construction whereby the combustion of the metal takes place in a closed and tightly stoppered vessel containing if desired a small quantity of water, which vessel is in

certainty. We find it convenient to form the strip of igniting paper in the form of a hook *e* attached to the magnesium ribbon and adapted to hook on the conductor *d*. In lieu of using paper as above described, we may apply sulphur, wax, or other readily inflammable substance to the end of the ribbon to ensure ignition. Moreover, we find it advantageous to slit the ribbon at the end for the same object.

The vessel *A* is supported on a table *c*, which can be raised and lowered as may be required, the same being carried, for example, by a telescopic tube *g* which is shown connected by clamps to the outer case *h* of a holder for containing oxygen gas. Any other suitable form of portable stand may be provided for supporting the vessel *A*. The gas-holder may conveniently comprise a rising and falling bell or dome *h* of any usual type arranged in the outer case *h*. It is connected to the vessel *A* by a flexible tube *j* which for convenience is joined to a rigid tube *j* that enters the vessel *A* through a stopper *a'* inserted in an opening *a''* formed at the side of the said vessel, the rigid tube *j* being bent upwards as shown, so that the water which is sometimes used in the vessel *A* to absorb the products of combustion cannot readily enter the tube when the vessel is being shaken.

The action of this apparatus is as follows, that is to say, the gas-holder or reservoir being first filled with oxygen gas from any convenient supply, the combustion vessel *A* is now placed in communication with it by the

Fig. 1.

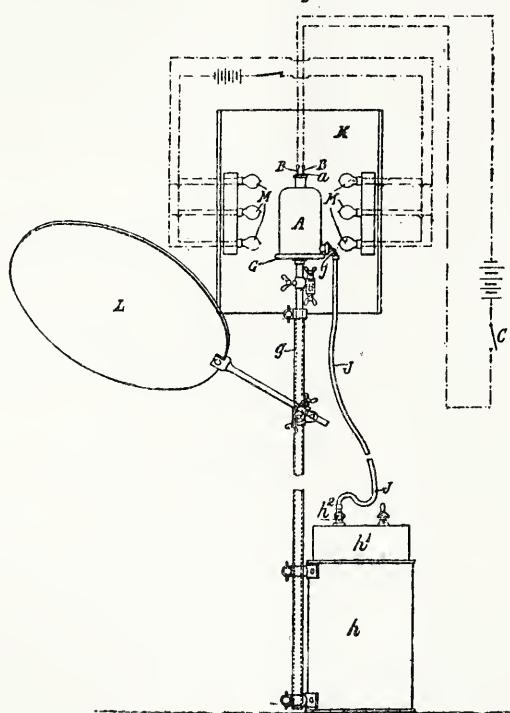
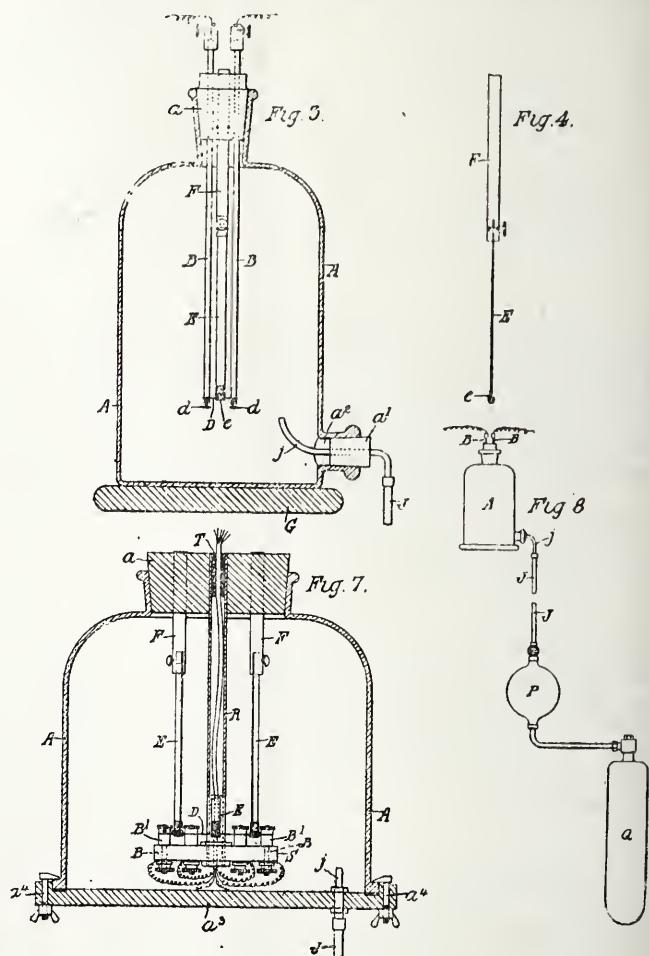


Fig. 2.



communication with another vessel, gas-holder or floating bell, of sufficient size, containing the oxygen supply, whereby no excessive pressure can be generated in the combustion vessel, while at the same time the products of combustion are confined and prevented from being diffused through the atmosphere of the room or studio.

Referring to figs. 1 to 4, *A* is a transparent or translucent vessel in which the combustion takes place, and which, for isochromatic photography, may be made of suitably coloured glass. The neck of the vessel is closed by a stopper *a* of indiarubber, for example, through which a pair of electric conductors *b*, *b'* are passed, said conductors being in circuit with a suitable source of electricity and a switch or contact-making push represented by *c*. The conductors *b*, *b'* are connected by a third conductor *d* secured by screws *d* or otherwise, the same being a thin wire of high resistance which becomes heated when the current is switched on. The magnesium or other ribbon *e* to be burned is fixed at one end in a clamp *f* carried by the stopper *a*, and the other end is maintained in contact with the thin conductor *d* in any suitable manner. To ensure that the metal ribbon shall light up when the thin conductor is heated, a strip of paper, saturated in nitrate of potash, for example, may be wrapped round the junction of the ribbon and conductor. This paper is ignited by the heated wire and serves to ignite the magnesium with



tube *j* and filled with oxygen. The stopper *a* fitted with the conductors *b*, *b'* is then inserted to close the neck of the vessel and the current is switched on, whereupon the thin conductor *d* becomes heated and the magnesium or other metal ribbon or wire *e* is lighted. The pressure induced by the sudden heating of the contents of the combustion vessel momentarily forces back some oxygen into the gas-container, but this is followed by a return movement wherein fresh oxygen takes the place of that consumed. The fumes or combustion products contained by the vessel *A* are then absorbed by the water therein, which process is facilitated by shaking the vessel, after which the stopper *a* can be removed and replaced by a fresh stopper fitted with conductors and another piece of metal ribbon or wire ready for a second flash. A cock *h* is provided to shut off the gas container, to prevent escape of oxygen while the stopper *a* is removed or at other times when required.

With this apparatus the fumes or combustion products do not enter the room or studio, and there is no danger of blowing the stopper out, or of bursting the combustion vessel. If desired, the water can be dispensed with.

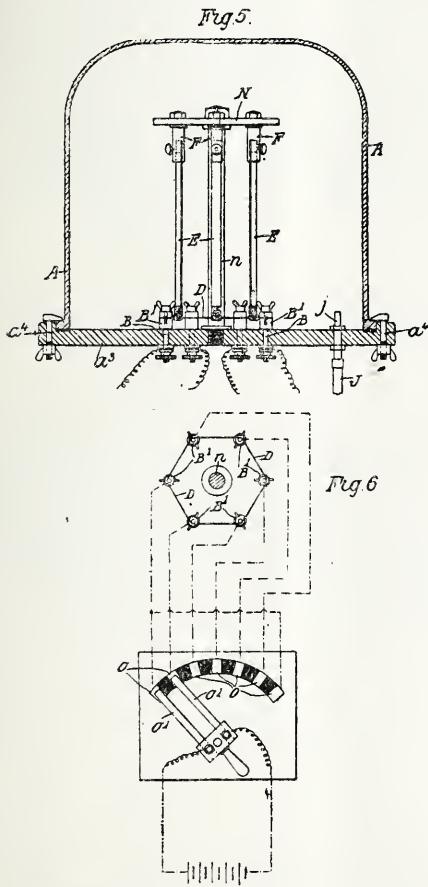
K is a curved reflector carried by the telescopic tube or standard *g* and adjustably arranged behind the combustion vessel *A* to throw the light in one direction either through an adjustable muslin or other suitable

filtering screen *L* before reaching the object to be photographed, or upon a white screen where it is reflected upon the object to be photographed. In either case the object being photographed, if a person or animal, is not startled by the flash and perfectly natural expressions of face and feature can thus be obtained. The screen *L* is shown adjustably mounted on the standard *g*.

In order to light up the sitter while focussing the camera, we provide, for example, electric glow lamps *M* or other suitable lights within the reflector *K*. The great advantage of this arrangement is that the light for focussing purposes comes from the same direction as that used for taking the picture, and hence the adjustment of the sitter can be effected with the utmost precision.

In lieu of the gas-holder shown in fig 1, an expandible gas-bag or bellows *P* (fig 8) may be used for the same purpose. Such a bag may be attached to a cylinder *Q* or other vessel containing compressed gas, whence the gas is allowed to escape at a low pressure through the usual reducing valve provided on such cylinders.

If it is desired to produce several combustions before the combustion vessel is opened, we provide a number of conductors and magnesium ribbons arranged between them, with means for firing the ribbons successively. One such arrangement is shown in figs 5 and 6 in which we provide for six successive combustions without opening the combustion



vessel. In this construction the vessel *A* is in the form of a bell clamped on a suitable base *a'* by means of screw clamps *a*¹. The six conductors *B* pass through the base *a'*, and they are furnished with means such as screw clamps *B*¹ at their upper ends by which the thin conductor *D* to be heated is secured to them. One wire extending round the six conductors *B* is used, the same being heated, ignited, or fused, in six different places successively as hereinafter described. The magnesium ribbons *E* are suspended in clamps *F* which depend from a plate *N* supported by a central pillar *n*, and the said ribbons make contact with the several sections of the conductor *D* as in the single arrangement above described. The electrical connections may be arranged as follows, that is to say, as indicated in fig 6, the conductors *B* are electrically connected respectively to terminals *o*, *o* on a switchboard having two switch arms *o*¹, *o*² operated by a common handle so that contact is made with two terminals simultaneously. By providing seven terminals *o*, connected as shown, any adjacent pair of said conductors can be switched into circuit and the wire *D* connecting such conductors thereby heated, ignited, or fused.

In fig. 7 we have shown a modification of fig. 5 in which the bell is provided with a large neck fitted with a stopper *a* from which the clamps for holding the magnesium ribbons are suspended as in fig. 3. The clamps or terminals *B*¹, *B*¹ are in this case mounted on a slate or other non-conducting plate *s* which is suspended by means of a central tube *a* from the stopper. The wire conductors leading to the terminals

*B*¹, *B*¹ pass through the tube *a* so that the conductors, terminals and ribbons are all carried by the stopper, and are removed and replaced together as in the first-described arrangement. The magnesium ribbons can thus be changed without requiring to raise the bell, and therefore without wasting the oxygen. Escape of oxygen gas through the tube *a* is prevented by packing the latter with any suitable packing material *r*.

The pipe *j* for conveying the oxygen to the bell is shown in both figs. 5 and 7, for convenience passing through the base *a*².

FAMILIAR TROUBLES WITH P.O.P.

A STORY went its rounds some time ago how an artist Judge at a certain photographic exhibition, which shall be nameless, wished exceedingly to give a medal to an execrable double-toned gelatino-chloride print on the ground that the colour contrast was so striking and original, and was only dissuaded by the emphatic and forcible protests of his photographic colleagues.

Be the tale true or otherwise, it serves at least to support the contention that unscientific methods of toning are by no means the monopoly of the guileless beginner. It really seems, judging from the innumerable questions constantly asked and answered in the inquiry column of the photographic journals, that the gelatino-chloride printing process, though professionally speaking, more used than any other, is comparatively little understood as regards its working theory. Why this should be is not so clear. Ample directions are, as a rule, issued with the paper by the different manufacturers, a common-sense adherence to which ought to ensure satisfactory results. The average photographer, unfortunately, has a fine contempt for printed instructions of any kind, just glances hastily at them, throws them aside, and follows them afar off, with free-and-easy variations of his own. Others, slavishly obedient to the letter, wander away from the spirit, and, while they would stand aghast if there were a fraction of a grain more of any given constituent in their toning bath, stumble over some simple matter not especially dealt with, but which a little intelligence would have helped them to avoid.

By far the larger number, probably, of those who come to grief over this process will be found among the ranks of men accustomed to working albumenised papers. They fondly imagine that the manipulation of these does not vary much in essentials from that of their later rival, P.O.P. When any one starts with this assumption, unless he has the advantage of practical advice from those familiar with gelatine papers, the result is a foregone conclusion. For a few weeks, perhaps, he will stock his show-case with glossy-surfaced prints, of varying degrees of excellence, or the reverse, soon to be banished again in favour of his first love. He will assure his friends that, "after all, there is nothing equal to the old albumenised paper, though certainly you cannot obtain it nowadays like it used to be. These gelatine papers are so uncertain, you can never get two batches of prints to tone alike," and so on. Are we not all familiar with the oft-told tale?

Now, these convictions are simply the natural result of trying to fit a square peg in a round hole, or, in other words, to apply a totally unsuitable system of working to a printing process very sensitive to any disturbing influence.

The albumenised process is so delightfully easy. The bath can be used over and over again, without any very serious attention. If a print is a shade too dark or a trifle over-toned, it does not very much matter, a little longer stay in the hypo will remedy this. As to washing, the prints can knock about for hours at their own sweet will without injury, while the mounting and finishing also present no special difficulties. In fact, this process may be called the elysium of the happy-go-lucky man. With the advent of P.O.P., "nous avons changé tout cela," a long farewell must be said to all old careless rule-of-thumb methods if success is here anticipated. Leaving the combined toning and fixing bath out of the question as being scarcely suited for employment commercially, the first difference we note is that the bath cannot be used more than once—in itself not a disadvantage, as far as concerns the production of uniform prints.

An often-ignored point is that the employment of distilled water—always an improvement—is sometimes a necessity, in making up the bath, and for the last washing water before toning. The least trace of acidity should be carefully guarded against, and the importance of an even temperature will soon force itself on our attention. The bath should always be tested with a thermometer before use, and never allowed to vary much of either side of 50° F. Working at too high a temperature is often the unsuspected cause of many of the bilious-looking prints so much lamented over.

When a bath containing ammonium sulphocyanide is used, the prints are generally passed through an alum solution, prior to toning, to counteract the softening of the film which follows the employment of the former salt. This is often carelessly and hastily done, especially the washing out of the alum, with the resulting consequence of uneven tones.

Sufficient care is not always taken to ensure the purity of the chemicals used; a trifling adulteration, that would perhaps have no evil effect on albumenised paper, may be fatal to success with P.O.P.

There is no need for any misgiving on this point if all purchases are made from a respectable dealer or chemist.

Probably the majority of failures in working gelatino-chloride papers have this in common, that, after fixing, the prints go down alarmingly in tone, assuming a dirty yellowish-brown hue of a decidedly patchy character. The cause, in nine cases out of ten, is over-toning. The unsuspecting printer, used to the comparatively leisurely manner in which albumenised prints conduct themselves during this operation, complacently suffers those on P.O.P. to, figuratively speaking, take the bit in their mouth, and fairly run away with themselves. A properly toned gelatine print loses but little in the fixing, and dries darker in proportion than one on albumenised paper. Owing to the extreme rapidity with which P.O.P. sometimes tones, with a bath of average formula under normal conditions, any but experienced workers are courting certain disaster if they attempt dealing with too many prints at once; about a dozen at a time will be found quite enough to attend to. It is perfectly useless to judge the tone by looking at the face of the print, they must be examined by transmitted light, in other words, held up and looked through.

When all reddishness has disappeared except in the darkest shadows, toning is completed, and the print should be immediately taken out. The cardinal mistake made by a good many well-meaning people is that they wait until the print appears toned all over alike when looked through. If this is done, over-toning has taken place, as the behaviour of such prints in the fixing bath will speedily demonstrate. The slight redness in the shadows, previously alluded to, will disappear on drying, leaving a rich and satisfactory tone.

Another cause of yellow prints is working with an exhausted bath. A certain quantity of solution will tone a definite number of prints and no more. If it is attempted to exceed that number, one of two things will happen; either the first few prints will be toned all right and the rest spoilt, or all of them may come to grief. Very much the same thing results even with a proper allowance of bath if the first few prints are left in too long, thus robbing the others of their fair share of gold.

The old happy way of using a stock toning bath, adding a little gold from time to time to replenish its exhausted vitality, and having no particular cause for alarm, though the mixture became thick, black, and sirupy, will not do with F.O.P. Fresh bath must be used each time in measured quantities, according to the number of prints, and thrown away when done with.

A favourite complaint against this paper is its undeniable propensity to what is called double toning. The explanation of this is simply that the toning solution has acted too rapidly on the surface of the print, before it has had time to penetrate through the gelatine to the deeper deposit of silver in the shadows. To a certain extent, perhaps, this is beyond prevention, though a properly toned print never exhibits it to any noticeable degree. A very slight warmth in the shadows is often, in artistic hands, rather an improvement than otherwise. When, however, we see two or three entirely different colours, ranging from a dirty grey to brick red, in the same picture, the thing becomes an eyesore and an abomination. Prevention is certainly better than cure in this case, for no remedy exists once the thing is done. If the happy medium is kept between too strong and too weak a bath, if careful attention is paid to maintaining a uniform temperature, if suitable negatives are used, and due precaution taken against prematurely exhausting the friendly gold, this woful affliction of chameleon toning will be overcome.

Expert P.O.P. manipulators may smile pitifully at much that has been said, thinking it perhaps a trite and unnecessary repetition of what, to them, is so familiar, and presents no difficulties. On the other hand, there are probably many who, for want of some such information, have long groped vainly in search of the golden rule that should make their work a success instead of a failure. It is not so long ago that one sorely tried printer, not necessarily incompetent, sent his query to a photographic contemporary, asking how to avoid whole batches of prints turning yellow after fixing, winding up, poor fellow, with the significant and sad remark that, if he could not get his next toning satisfactory, his place would probably know him no more. Perhaps enough has now been said to prove that the foregoing hints and cautions are not entirely uncalled for, nor likely to be thrown away, even though to many they may convey nothing strikingly new or original.

A. LOCKETT.

negative is in condition to be presented to the camera. Then by means of a camera, and by the wet or collodion process, a positive image from said initial negative is photographed upon a glass plate. The plate bearing this positive image, after drying, is then reversed in a camera box and a screen negative is photographically made therefrom. The screen negative thus produced may now be printed on the sensitised zinc plate, and the positive image thus imprinted on said plate may immediately be etched.

The performance of the entire process of producing the screen negative need not consume more than a few minutes of time, and the production of the etched plate, ready to be printed from, can be made in a like short space of time.

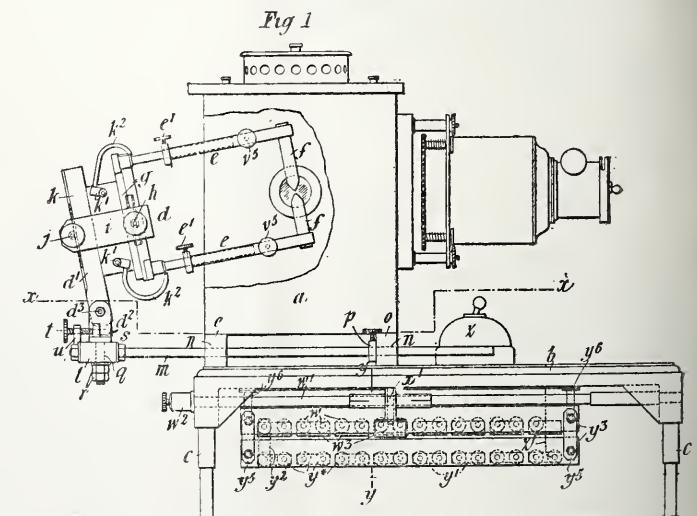
In addition to the economy in time and labour resulting from my described process, other and further advantages are thereby secured. For instance, the glass plate bearing the positive image photographed from the initial negative, being free from the grain of a photographic print or picture on paper, the said positive image may be an enlargement, photographically, of said initial negative image, so that a small snap-shot negative of, say, two by three inches, can, as soon as developed, be photographically enlarged up to, say, eleven by fourteen inches, or, in some instances, to even greater dimensions in said positive image. The said resulting positive image will be an image only, and free of texture or grain of paper. Again, the possible injury to or distortion of a delicate and elastic film, in reversing the said positive image, which is likely to occur in floating off from its plate the film bearing said positive image, turning said film over and then floating it on to another plate, as is at present done in the process of producing screen negatives for use in making half-tone printing plates, is wholly avoided. Furthermore, a "hard," under-timed initial negative, which would not make a good paper print, can be softened by the proper exposure in the camera, and a good brilliant positive image on glass be obtained; while a "soft" or over-exposed initial negative, useless for printing on paper, can be made to give a brilliant positive on glass in the manner described.

KAMM'S IMPROVEMENTS IN ELECTRIC ARC PROJECTING LANTERNS.

[Patent No. 15,967 of 1899.]

a is the lantern of any ordinary construction and *b* the base thereof supported on the legs *c*. *d* is the lamp of known construction, that is to say, it has rods *e* for supporting the carbons *f* and carried by rack bars *g* operated by the pinion *h* for moving the said carbons towards or away from each other, the said pinion being carried by side plates *i*, which also carry another pinion *j* engaging a rack-bar *k* so that the arc can be adjusted vertically. *k* are terminals for the attachment of the wires conveying the current to the lamp and in electrical connexion with the rods *e* by the wires *k*.

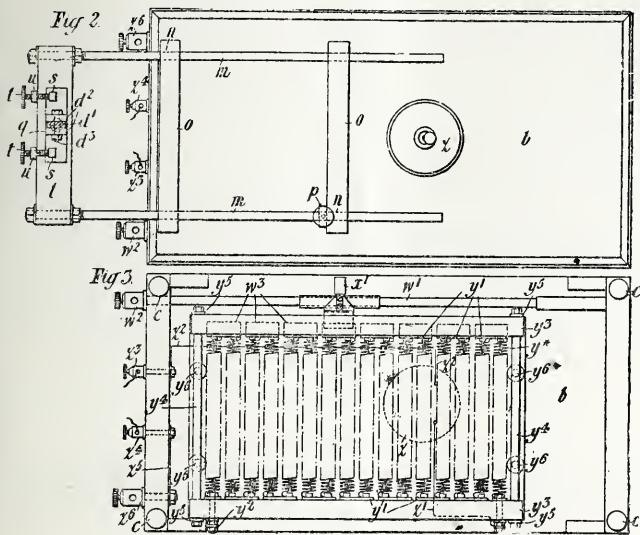
The patentee says: "I arrange for the longitudinal adjustment of the



"For adjusting the arc laterally I provide for turning the lamp on a vertical axis. For this purpose the part d^2 of the lamp frame is provided with a pin or bolt q passing through but free to turn in the platform l , and held therein by nuts r . I also provide the said part d^2 of the lamp frame with lugs s on opposite sides of the pin q , against which lugs bear set-screws t passing through lugs u on the platform l . By slackening one set-screw and tightening the other one the lamp frame will be caused to turn upon the axis of the pin q and move the arc laterally."

"The rods e , for supporting the carbons f , I form telescopic as shown in fig. 1, whereby their length can be varied for the purpose of adjusting the arc nearer to or farther from the frame d^1 , d^2 , set screws e^1 , or the like, being employed to fix the parts when adjusted."

"For holding the carbons f to the said rods e I provide clips or bars



v , hinged at v^1 to the said rods as shown distinctly in figs. 5 and 6, the said clips and rods being recessed as at v^2 to receive the said carbons. I also provide springs v^3 , which, while normally causing the clips to press and hold the carbons against the rods e , will yield when extensions v^4 on the said clips are pressed towards the rods e and release the carbons. v^5 are set-screws passing through the rods e , and which can be caused to bear against the clips v to fix the carbons securely in position. By the described arrangement it will be understood that it is not necessary to hold each carbon with one hand while fixing it in position by the set-screw with the other hand, the carbon being first inserted between the clip v and rod e , and then the screw tightened.

"I also arrange in connexion with the lamp a series of resistance coils, w , which are placed beneath the base b of the lantern, a sliding switch x^1 being arranged in connexion with the said coils w so that more or less resistance can be put into the lamp circuit. The said switch slides

MR. W. H. TOMLINSON, of 81, Dale-street, Liverpool, is issuing a neat catalogue of fifty pages. It illustrates and describes a considerable variety of apparatus and material suitable for the requirements of amateur photographers, prominence being given to Mr. Tomlinson's speciality, the Practical Hand Camera.

Over the Alps on a Bicycle, by Mrs. Pennell, is a gaily written account of how the lady established a wheel record, which she apparently thinks deserves to be bracketed equal with the achievements of Hannibal and Napoleon. The authoress insists, perhaps too strongly and too often, upon her American nationality, and now and then forces her humour almost to the sacrifice of good taste; but the book is so amusing that possibly these things will escape the notice of the ordinary reader. The illustrations are by Mr. Joseph Pennell, the "J" of the book, who (we quote the authoress) "always collapses, somewhere, somehow, on these trips." Fie! Mrs. Pennell! The book, which is published by Mr. Fisher Unwin, price 1s., contains the following complimentary references to the Geneva photographers: "We came to Geneva, and wheeled down the long street, at the end of which Mont Blanc, according to all photographic shops, rears its head so proudly. But Mont Blanc was not there, and a second glance showed that it would not have been in the photographs either if the photographer had not painted it in. I began to wonder if, like the Swiss waiter, it had gone abroad to make its fortune."

CONVENTION PHOTOGRAPHS.

We continue to receive pleasant photographic reminders of the Newcastle Convention, a successful gathering all through, as we are still constantly hearing. Our friend, Mr. F. A. Bridge, the Hon. Secretary and Treasurer (commendatory adjectives are quite superfluous), kindly sends us a little print of a group of three posed and photographed by himself on the steps of Haughton Castle. The portraits are those of Mr. Crooke, Mr. Pattison Gibson, and another, who here thanks Mr. Bridge for the excellent photograph. The official group, taken by Mr. W. Parry, of South Shields, has excited the very greatest admiration. The figures were well placed, amidst beautiful surroundings, and a faultless negative was the result. A richly toned gelatino-chloride print hangs in our office, and, for our private use, Mr. Parry has supplied us with a tastefully framed print in sepia platinum, and a fine and vigorous piece of photographic work it is. We left the framing of the picture to Mr. Parry, who chose a new dark wood moulding of a singularly appropriate character. The indefatigable stereoscopist, Mr. Alfred Seaman, sends us a dozen binocular views, chiefly taken, to quote his own words, "on that very memorable and enjoyable afternoon in Jesmond Dene." Groups and portraits of prominent Conventionists, as well as views, are the subject of these slides, copies of which Mr. Seaman kindly offers to send to friends. Mr. Seaman certainly knows how to make a good stereograph, and not for the first time are we called upon to thank him for evidences of his skill in this direction. Lastly, we have to thank Mr. S. Herbert Fry for some capital snap-shot portraits taken at Hexham.

THE first number of Hurman's *Photographic Chat*, a journal for amateur photographers, has reached us. It is issued by the well-known firm of photographic dealers, Messrs. Hurman, Limited, of St. Nicholas-buildings, Newcastle-on-Tyne. The new comer, which has our best wishes for a long and useful career, quite fulfils the promise of its title, and gives the amateur reader fourteen pages of simply and clearly expressed photographic information of a useful kind. From an article on Stereoscopy we extract the following lucid definition of binocular work, it could hardly be improved on: "A stereoscopic camera is like the two eyes without the brain. It separates the object or landscape into two pictures, obtained from different points of view. The stereoscope is the instrument which aids us to recombine them into a solid perception. We look through the two prismatic glasses which serve to bend the lines of sight outwards, and so, when we turn our eyes inward to look at the central object of the view, we think and feel as if both eyes were looking at one object from different points, as in nature; whereas, in reality, we are looking at two views, one with the left eye and the other with the right." *Photographic Chat* is published monthly, price 1d.

Studio Gossip.

REMOVAL OF FOXY STAINS FROM ENGRAVINGS AND PAPER.—The copper or steel-plate engraving is immersed in a six per cent. solution of sodium phosphate for from two hours to two days as is required; it is then washed with clean water and dried.—*Deut. Am. Apoth. Zeit.*, 21, 19.

upon and is guided by a rod w^1 , connected to one of the terminals w^2 of the lamp circuit and is designed to make contact with plates, w^3 , at one end of the coils, which plates together with similar plates at the other end of the coils connect the coils in "series." y^* is another series of resistance coils connected in "series" by plates, y^1 , and in electrical connexion with the coils w through the strip y^2 . The coils w and y^* are carried by frames consisting of bars y^3 of insulating material and rods y^4 , the frames being connected together by plates y^5 and suspended beneath the base b by rods y^6 . z is a switch for switching on the current from the generator, which current enters at the terminal w^2 , passes through the rod w^1 , the switch x^1 , the coils w , between the said switch and the strip y^2 , the said strip, the coils y^* , the wire z^1 , to the switch z , the wire z^2 , from the switch z to the terminal z^3 , thence to the lamp by a wire connected to one of the terminals k^1 , and back from the other terminal k^1 , to the terminal z^4 , wire z^5 , and terminal z^6 , back to the generator."

THE LATE LORD RUSSELL OF KILLOWEN.—The following anecdote is related of the late Lord Chief Justice:—Once, perhaps, for a brief moment, he was taken aback. A photograph of himself, together with his young marshal, a son of Sir Squire Bancroft, was printed in *Sketch* with the underline, “Lord Russell of Killowen, and the author of *Teresa*.” Lord Russell, who was in the same position towards *Teresa* that Lord Coleridge held towards Connie Gilchrist and Mr. Justice Day towards Mr. Conan Doyle, was travelling in Ireland when the picture appeared. At a wayside station a bookstall man approached and asked him if he had seen himself in *Sketch*, seated with the author of *Teresa*. “*Teresa whom?*” asked the Chief in a tone that startled his informant. The paper was produced, and by degrees the situation was cleared up.

News and Notes.

PHOTOGRAPHY is to have a place in the Blackburn Technical School curriculum next session. A class for theoretical and practical instruction in photography is to be established, provided a sufficient number of intending students enter their names.

WE are sorry to learn of the death on Sunday last of Mr. H. J. White, the Manager of Messrs. Fallowfield, a position he had occupied for over twenty years. The deceased gentleman, who was widely known and respected in the photographic trade, succumbed to an attack of pleurisy and bronchitis. He was forty-one years of age, and leaves a wife and family.

A TELESCOPE DISCOVERS A THEFT.—*The Scientific American* states that a telescope was recently being tested at the Bausch & Lomb Optical Works, at Rochester, N.Y., and it was turned on a bridge, and the observer saw a young thief take a tub of butter from a waggon and conceal it. The police were telephoned to, and the thief was captured as he was attempting to carry away his prize a few hours later. This is an interesting use of the telescope.

THE Fifth Annual Exhibition of the Hove Camera Club will be held at the Town Hall, Hove, on November 22-24. The following are the Open Classes:—Class A, Landscape and Marine; B, Figure and Portraiture; C, Architecture; D, Any other subject than the above; E, Lantern Slides, any subject, in set or sets of four; F, A set or sets of four pictures by exhibitors who have never gained an award in photography. Prospectuses will be ready in October, and copies will be sent in due course upon application to Mr. C. Berrington-Stoner, Hon. Secretary, 24, Holland-road, Hove.

PHOTOGRAPHY AT OBER-AMMERGAU.—*The Church Times* prints a warning against cinematograph representations of scenes from the Ober-Ammergau Passion Play. It is well known that no visitor is permitted to employ or even to take into the building (it is really now a theatre) any photographic apparatus whatever. But it is not so well known that the managers of the Passion-Spiel—one, if not more, of whom is an opera director from Munich—sell the photographic rights of the Play to the highest bidder, and in due course the photographs are purchased at extortionate prices.

ANOTHER RESTRICTION IN THE SALE OF CHEMICALS.—After years of perseverance, the pharmaceutical chemists have secured the same monopoly in the sale of carbolic acid as they have in some of the chemicals used in photography, the bichloride of mercury and cyanide of potassium to wit. Now, if one wants a little carbolic acid for disinfecting purposes, he must go to the pharmaceutical chemist instead of the oilshop for it, and pay whatever he likes to charge, the same as he has to for the two chemicals just named. Of course, every one knows that he has to pay the chemist a much higher price for the latter than he used to pay the photographic dealer, while, in the case of the cyanide, the material, as a rule, is not so good as we used to get from the dealers. The worst sample of cyanide we ever had to do with was purchased at a pharmaceutical chemist's. It remains to be seen if there will be fewer suicides and accidents from carbolic acid, now that chemists have the monopoly in it, than there were formerly.

EXHIBITION AT DURHAM.—In connexion with the Twenty-eighth Annual Exhibition of the Durham Floral Society, to be held September 11 and 12 next, there will be an industrial department, of which photography will form a section. We extract the following particulars from the schedule:—Section 5, Photographs (open to all). Entry fee, 1s. per frame or exhibit. 18, Flowers, fruit, vegetables, or kindred subjects: 1st, silver medal; 2nd, bronze medal. 19, Landscape or seascape: 1st, silver medal; 2nd, bronze medal. 20, Hand-camera work: 1st, silver medal; 2nd, bronze medal. 21, Portraiture or any subject other than Classes 18, 19, 20: 1st, silver medal; 2nd, bronze medal. All photographs must be mounted, but framing optional. The full schedule, entry forms, &c., may be obtained of Mr. R. Hauxwell, The Avenue, Durham. It will be remembered that, on the occasion of the Convention excursion to Durham, Mr. Hauxwell was a most assiduous and courteous leader, and, no doubt, he would be pleased to receive entries from some of the photographers gathered in Durham on that occasion.

A PHOTOGRAPHER UNDER FIRE.—An amusing instance of a photographer's “nerve” was told by Mr. Donald McDonald, at the Town Hall, Melbourne, two or three months ago. “During one of the battles in or around Ladysmith, Mr. McDonald and another correspondent, finding themselves under fire,” says the *Australian Photographic Review*, “were forced to lie flat to avoid the bullets that were flying around them. To their surprise, a small photographer walked coolly past them some fifty yards right into the thick of the bullets, and proceeded leisurely to set up his apparatus, the Mauser bullets biting the ground all round him with their peculiar clicking noise. His bravery astonished the correspondents, who were neither nervous men. At last it dawned upon them that perhaps the artist didn't know his danger. One of them cried out, ‘Hey! do you know you're under fire?’ ‘The devil!’ said the photographer, ‘I thought they were insects.’ And, snatching the camera up, he made for the nearest ditch, where he carefully hid till the completion of the battle. Needless to say that, though the photographer exposed himself, the plates were never exposed.”

ON Wednesday, August 8, the Earl of Crawford received the freedom of Wigan, as a mark of grateful appreciation of many generous acts performed by his Lordship towards the community, and of the interest he has always taken in its welfare. Our contemporary, the *Daily Telegraph*, states that, in returning thanks for the honour, the Earl of Crawford, who received an enthusiastic ovation which proved the esteem in which he is held by the people of Wigan, said he was proud to link with his name that of the ancient house of Bradshaigh, who, in the olden times, lived at Haigh Hall (now his Lordship's principal residence), and to whom they were indebted for starting in that part of Lancashire the great coal industry. Speaking of libraries, he said his mind was carried back 300 years, when a predecessor in the title collected what was considered to be the finest library then existing in private hands in the north of Scotland. Troublesome times, however, arose, and the library was dispersed and sold to cheesemen to wrap up pats of butter. Years moved on, and his father commenced the renewal of the library at Haigh, whilst he himself had done fairly well towards the preservation of that great work. He accepted the town's honour with the greatest thankfulness, and trusted he might not be the last of his house who would render himself worthy of equal recognition. Subsequently, Lord Crawford was entertained at a banquet, and, in response to the toast of “The New Freeman,” briefly referred to his political career, and said he held the unique position as a member of Parliament, because he was the only man in the world who made a maiden speech in the House of Commons at eight o'clock in the morning. A member in those days was much more free in his action than now, when he was kept in the House practically “doing time.” The *Daily Chronicle* reminds us that the Earl is a shining light in science and letters. Thirty years ago he formed part of an expedition to Spain to observe a total solar eclipse, and the Dun Echt Observatory owes its origin to his endeavours. He was President of the Royal Astronomical Society in 1878 and 1879, and has filled a similar office in connexion with the Library Association, the Bibliographical Society, and the Photographic Society, whilst for twenty-two years he has been President of the Central Association for dealing with distress caused by mining accidents. The Earl is Colonel of the 1st V.B. of the Manchester Regiment, and counts the K.T. among his titular honours.

Commercial Intelligence.

THE Thorn & Hoddle Acetylene Company, Limited, have declared an interim dividend of five per cent. per annum, for the six months ending June 30, 1900.

THE PARIS EXHIBITION.—It may interest many readers to know that Messrs. Gaze, the well-known tourist agents, under whose auspices the Society of Chemical Industry, the Iron and Steel Institute, and other prominent trade societies are visiting the Paris Exhibition, will be pleased to answer inquiries of visitors who contemplate doing this great world show. The firm possess exceptional facilities and a complete organization on the Continent, which they put at the disposal of patrons. Individual inquiries will receive prompt attention if addressed to Messrs. Gaze, tourist agents, 142, Strand, London, W.C.

THE Thornton-Pickard Manufacturing Company, of Altrincham, send us a copy of the new French edition of their illustrated catalogue. This completes the series of catalogues—English, German, Spanish, and French—for 1900. The Company add: “Our wholesale agents for the United States of America also issue 20,000 catalogues of our goods, with the prices arranged to include duty payable on these goods, and therefore specially suitable for the American market. In distributing all these various editions, we endeavour to reach the best photographic dealers, also professional and amateur photographers in the world.”

AMERICAN CAMERAS IN ENGLAND.—“A rather curious feature of our British exchanges at present is the large amount of advertising they carry announcing American cameras and specialties manufactured on this side of the Atlantic,” says the *Photo-Miniature*. “We say ‘curious’ because in many instances the British agents for American manufacturers are apparently able and willing to spend much larger sums in advertising American specialties abroad than our manufacturers are able to afford in the home markets. Looking over these advertisements, there can be no doubt that the American manufacturer of photographic goods is woefully lacking in enterprise when compared with his foreign agents. When will our American manufacturers awaken to the fact that advertising is the soul of business, and that the cultivation of the home market by a generous amount of legitimate advertising is more profitable than selling their output to foreign agents on a pitifully small margin of profit over cost of manufacture?”

WE are informed that the Bausch & Lomb Optical Company, Rochester, N.Y., are again adding to their lens-making plant. The present building has a floor area of 138,000 square feet. The new wing is 96 feet long and 22 feet deep, the whole having a floor area of nearly 40,000 square feet. The Roebling Construction Company, builders of the Brooklyn Bridge, have the work in hand, their fireproof construction being employed throughout. As the larger wing will be used for the grinding and polishing of photographic lenses, it is constructed with the utmost solidity, the piers of which the walls are composed being three feet thick at their bases. Huge windows occupy the spaces between the piers, admitting an abundance of light. The floors are especially designed to prevent vibration, being tested to 4000 pounds per square foot, or a total weight for the building of 160,000,000 pounds. About half of the smaller wing will be occupied by vaults for the storage of valuable material, such as optical glass.

Re FRANK EDWARDS BROWN, manufacturer of photographic apparatus, 36, Charlotte-road, and 3, Exeter-street, Birmingham.—The statutory meeting of the creditors interested hereunder took place at the offices of the Official Receiver for the Birmingham district on the 9th inst. The statement of affairs filed by the debtor disclosed gross liabilities expected to rank amounting to 1503*l.* 2*s.*, and the assets were estimated to produce 1982*l.* 3*s.* 8*d.*, thus leaving a deficiency of 1304*l.* 18*s.* 4*d.* It appeared from the report and observations of the Official Receiver that, until January 1898, the bankrupt was engaged with his grandfather, who was trading at 3, Exeter-street, Birmingham, as a manufacturer of photographic apparatus, when he transferred the business to the bankrupt. No balance-sheet was prepared, but the bankrupt stated that the leasehold premises and fixtures were mortgaged for their full value to his bankers, and that the available assets were insufficient to pay the liabilities. Notwithstanding this fact, he undertook to pay his grandfather an annuity of 156*l.*, and, on his death, to continue the payment to his own mother. The explanation given by the bankrupt for taking over an insolvent concern without capital to work it was that it was an old-established business, and he thought that with perseverance, and the overdraft at the bankers increased from 1200*l.* to 1500*l.*, he would be able to succeed. A balance-sheet, dated December 31, 1899, disclosed liabilities amounting to 3205*l.* 17*s.* 3*d.*, and assets 4127*l.* 3*s.* 1*d.*, but the surplus of 920*l.* was subject to the annuity referred to. During 1899, in consequence of an increase in orders, the bankrupt purchased further plant, amounting to about 500*l.*, which had improved the bank's security. The trading account from November 1898 to December 1899, after providing 156*l.* 17*s.* 3*d.* for bank charges, and 191*l.* 10*s.* annuity, showed a profit of 454*l.* 19*s.* 5*d.* The trade fell away in the January following, and on May 24, 1900, a deed of assignment was executed, and Mr. F. H. Haswell appointed trustee. The landlord distrained for 50*l.*, arrears of rent, and sold a portion of the effects at, according to the bankrupt's statement, a great sacrifice. According to the balance-sheet above referred to, the stock in December 1899 amounted to 1777*l.* 0*s.* 6*d.* whilst it is now estimated at only 175*l.* On March 10, the bankrupt assigned his book debts to the bank in consideration of an advance of 250*l.* Eventually the estate was left in the hands of the Official Receiver for summary administration in the usual manner.

KODAK, LIMITED, IN GLASGOW.—Although the Glasgow branch of this enterprising Company has only been open for a matter of days, Mr. Frank H. Burr, the Manager, says the business already done has exceeded his most sanguine expectations. The Company have been fortunate in two respects—in their choice of premises and in their choice of a decorator. At 72, Buchanan-street, their retail warehouse is in the very centre of Glasgow's most fashionable shopping quarter, while their wholesale dépôt for Scotland, at 74, Buchanan-street, is within a minute's walk of the stations of the three great railway companies. Mr. L. P. Kerkham, the architect of the Company, has worked wonders in adapting the premises to the business now to be carried on in them, while Mr. George Walton has had a free hand in designing the show-cases and in decorating and furnishing the various rooms, the net result being a commercial establishment wholly unique even for such a go-ahead city as Glasgow. As regards the wholesale dépôt, it may be sufficient to say that it is a miniature Clerkenwell-road, the American system of storing, packing, and dispatching goods being reproduced in every detail. It is intended to meet the demands of the wholesale trade in Scotland from this dépôt. In the retail department no expense has been spared, with a view to making it artistically attractive. The fittings are of oak, made at the Company's works at Harrow from Mr. Walton's designs, and the mural scheme displays that designer's native originality to the full. On the walls are shown numerous direct photographs and enlargements, typical examples of Kodak photography. This department may be said to be a reduced facsimile of the great Oxford-street warehouse. On the first floor, and communicating with the retail shop, a large and richly furnished demonstrating room has been fitted up, with a dark room adjoining. Here it is intended to give demonstrations of photographic work in all its branches, from the insertion of a spool of film to the production of a finished negative or a Dekko print. The basement floor has been equipped with a hydraulic hoist for the reception of goods, and it communicates in turn with the retail and wholesale flats by means of a smaller hoist. A section of this flat has been fitted up for the development of films, the dark room being a model of its kind, special attention having been paid to its ventilation. The whole establishment has been wired for electric light. Mr. F. H. Burr, who has been appointed Manager, after setting the Liverpool branch agoing, enters upon his new sphere full of hope.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
20.....	Southampton	<i>The Platinotype Process.</i> S. G. Kimber.
21.....	Hackney.....	Hand-camera Work.
25.....	Birmingham Photo. Society	{ Excursion: Henley-in-Arden and Beau- desert. Leader, A. C. Gilbert.
25.....	Bootle	{ Excursion: Hoylake. Leader, Captain Sibthorpe.
25.....	Borough Polytechnic	{ Excursion: Wimbledon Common. Leader, A. Bedding.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 8.—Mr. T. E. Freshwater in the chair.

Mr. HENDERSON passed round the transparency he had shown at the previous meeting, and from which, in one portion, he had completely removed the stain by moistening the film, and placing the plate on a measure containing a solution of ferricyanide of potassium. There had been no contact, the reduction being carried out by the fumes of the ferricyanide.

Mr. W. D. WELFORD showed a carbon-film negative which was covered with small opaque spots, and inquired if any member could account for them.

Mr. S. H. FRY did not consider they arose from any error in manipulation, but were due to a defect in the manufacture; probably they were insoluble portions of the coating, which had by some means escaped filtering.

Mr. A. L. HENDERSON stated that he had been making experiments with potassium cyanide as a restrainer, and had found it immensely superior to bromide; he had also found that a combination of quinol, metol, and adurol possessed great advantages as a developer. His formula was:—

No. 1.	
Quinol	120 grains.
Metol	40 ,
Adurol	40 ,
Water	27 ounces.

No. 2.	
Sodium sulphite	2 ounces.
Sodium hydrate	60 grains.
Potassium carbonate	60 ,
Water	27 ounces.

Equal parts of each to be used.

Restrainer.—Potassium cyanide, 20 grains to 1 ounce of water, and of which 1 ounce could be used to every 4 ounces of mixed developer.

Mr. HENDERSON recommended that two developers should be made up, one containing the restrainer and one without. Then, if the image flashed up in the latter, the plate should be at once transferred to the solution containing the restrainer. It would be then found that, instead of the shadows fogging over as usual, they would remain perfectly clear, and a perfectly gradated image would be the result.

Some discussion took place respecting Mr. Welford's demonstration of rapid development.

Mr. HENDERSON maintained that the success of the method depended a great deal on the class of subject. It would be impossible to obtain a satisfactory negative, in this rapid manner, of a very flat subject. He had not experimented, but was confident that he could produce a developer that would act quite as quickly as Mr. Welford's.

It was finally agreed that a trial should be held at some later date to decide as to the merits of the developer prepared by Mr. Henderson and that which Mr. Welford had used in his demonstration.

PHOTOGRAPHIC CLUB.

AUGUST 8.—Mr. John R. Williams in the chair.

The Photographic Society of India sent an invitation to participate in their Exhibition in 1901.

The Société de Photographie de St. Pétersbourg sent a circular referring to their Exhibition of lantern slides, which will take place at the end of the present year.

Mr. George E. BROWN showed an ingenious contrivance which could be used either as a washing apparatus, drying rack, or printing frame. The apparatus was well made in incorrodible metal, and the idea was generally considered rather clever. Whether, however, the contrivance will ever find a place in the dark room of the practical photographer this is, as Rudyard Kipling says, "another story."

Mr. WILLIAMS mentioned a very good method of drying negatives very quickly and economically. Some gelatine is placed in a rather deep dish, the wet negative is put on the top, and the whole flooded with alcohol. The alcohol then mixes with the water contained in the negative, and at the same time the gelatine attracts the water which in this way has become part of the solution. The result is that the alcohol can be used over and over again, whilst the gelatine at the end of the operation is exposed to the air to dry, and it is then ready to begin its water-wolfsing work.

Mr. BROWN showed some prints made on a silver phosphate paper made by Dr. Johannes Meyer, of New York, by dissolving silver phosphate in tartaric acid. This forms an emulsion, which is applied to the paper without the use of any other medium. The paper, which is a print-out paper, is then exposed under a negative, care being taken not to overprint, as no reduction takes place during fixing. The print is then fixed for a few minutes in a three per cent. solution of hypo, which has been made alkaline by the addition of sodium carbonate, and finally washed. The result is a print of a very good brown colour, which it is possible to convert into a grey by toning either with gold or platinum. From the results shown it would, however, appear that the toning, especially the toning with gold, is hardly an improvement on those prints that have only been fixed, and it would seem best to leave the precious metals alone when using the paper in question. Mr. Brown mentioned that, according to Dr. E. Valenta, the phosphate emulsion above referred to would be mixed with a bromide emulsion, to which alcohol and glycerine had been added, and that a paper coated with the resulting emulsion would print by gaslight. Mr. Brown distributed some samples of the phosphate paper, which is not yet commercially obtainable.

FORTHCOMING EXHIBITIONS.

1900.

August 21..... Royal Cornwall Polytechnic Society. W. Brooks,
Laurel Villa, Wray Park, Reigate.

Sept. 21-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly.
Hon. Secretary, R. W. Craigie, Camera Club,
Charing Cross-road, W.C.

October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.

November 7-10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.

12-17 Ashton-under-Lyne.

21-23 Hackney Photographic Society.

22-24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.

1901.

January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

THE following applications for Patents were made between July 30 and August 4, 1800:-

CAMERAS.—No. 13,667. "Improvements in or relating to Photographic Cameras." Communicated by F. A. Brownell. KODAK, LIMITED.

CAMERAS.—No. 13,668. "Improvements in or relating to Photographic Cameras." Communicated by G. Eastman. KODAK, LIMITED.

CAMERAS.—No. 13,829. "Improvements in or relating to Photographic Cameras." Communicated by F. A. Brownell. KODAK, LIMITED.

PANORAMIC CAMERAS.—No. 13,830. "Improvements in or relating to Panoramic Photographic Cameras." Communicated by F. A. Brownell. KODAK, LIMITED.

CINEMATOGRAPH.—No. 13,883.—"Improvements in or relating to Kinetoscopic or Cinematographic Apparatus." W. FRIESE-GREENE.

FOCUSING SCREEN.—No. 13,916. "An Improved Suction Device for Attaching a Lens to a Focusing Screen of a Photographic Camera and for like Uses." W. BROOKES.

X-RAY TUBES.—No. 13,966. "Improvements in Röntgen-ray Tubes." Complete specification. Communicated by E. Thomson. THE BRITISH THOMSON-HOUSTON COMPANY, LIMITED.

PACKING CHEMICALS.—No. 14,047. "Improvements in Receptacles for Holding Small Quantities of Photographic Chemicals or other Materials." J. J. GRIFFIN & SONS, LIMITED, and F. H. IBBETSON.

DEVELOPING FILMS.—No. 14,068. "An Improvement in the Development of Photographic Films." E. R. BRICKELL.

Correspondence.

** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

** We do not undertake responsibility for the opinions expressed by our correspondents.

PHOTOGRAPHY AT THE PARIS EXHIBITION.

To the Editors.

GENTLEMEN,—I write to ask if you could kindly give me information as to how to find out who are the prize-winners in the Photographic Section of the Paris Exhibition. I understand there was a photographic section and the prizes have been awarded to successful competitors, and, for certain reasons, I desire to know whether certain photographs which have been presumed to have been exhibited have been successful or not, as I am asked to purchase one on that understanding. If such is the case, I presume there will be a secretary to that section, and a list of successful competitors and subjects should be able to be obtained, and if so I thought it possible you might be able to supply me with either his name and address or advise me as to what steps to take to obtain it. If you would kindly give me your advice in the matter, I should esteem it a favour.

A. JEFFREY.

46, Queen-street, Keighley, August 8, 1900.
[No medals will be awarded to British photographs at the Paris Exhibition. The space allotted was so small that the organization of the displays of pictorial and scientific work now on view was left to Mr. R. W. Craigie and General Waterhouse. Thus, photographs for competition not being invited, it follows that no awards will be made.—Eds.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PRINTING FROM KODAK FILMS.—J. MILNE writes for information how to print Kodak films so as to prevent the films absorbing the silver from the printing paper.—Fix and wash the films thoroughly; then, if they and the paper are thoroughly dry, there will be no trouble. Unless this is attended to, the prints will become stained with continuous printing.

LICENCE FOR STILL.—J. O'CONNEL writes anent an answer we gave a short time back as regards a licence to use a still. He wants to know if a licence would be required if the still were only used for distilling water.—Yes, a licence is required whatever the still may be employed for. It is illegal to have a still on the premises without a licence.

MAKING AN ENLARGING BOX.—MACK writes, asking where he can find instructions how to make an enlarging box.—We are afraid we do not quite understand what you mean by an "enlarging box." Enlarging is usually done in a room, or in an enlarging camera, i.e., a camera with a long, extending bellows. On pp. 696-822 of the ALMANAC for 1898 there are articles that may be of service to you.

MARKINGS ON PRINTS.—J. H. B. writes:—"Can you account for the star-like marking in the enclosed two prints? One, the carbon, is from a print I tried to do; the other, a P.O.P., is by a friend of mine. Both seem to be due to the same cause, and it, apparently, looks to be bacterial."—As the markings appear both in the carbon and the silver prints, the cause must be looked for in the negatives. They have every appearance of being hyposulphite of soda that has crystallised in the film.

NEW PLATES FOR OLD.—J. C. H. says:—"I have several gross of negatives that are of no use. Can you give me the name of any good plate-maker who would take them for the glass, and give me new plates in exchange? I have written to the makers from whom I had the plates, and they say they are not worth the trouble of cleaning off. I should not mind if they would give me a dozen plates for every gross of negatives."—We do not surmise that any plate-makers would take the glass, as new glass is now so cheap, and so much less trouble to clean than old is.

LORD KELVIN'S LECTURE.—PHOTOPHIL writes:—"In your issue of April 13 last you announced that a lecture would be given by 'the Right Hon. Lord Kelvin on "Nineteenth-century Clouds over the Dynamical Theory of Heat," &c.' This is not yet published. Could you kindly give me a hint as to where I might find the best or fullest report of the same—Nature or the Times—as I would get it if possible?"—In reply: We have not seen a published report of the lecture. A letter to the Secretary, Royal Institute, Albemarle-street, would probably bring the desired information.

STAINED NEGATIVE.—T. RAY writes:—"Will you please tell me the cause of the stains on the negative I send herewith? I have a number like them, and the stains did not appear until they had been printed from several times. They were stainless at first. Do you think it is the fault of the plates? they are ____ plates."—No, certainly not. The stains are due to the plates not being properly washed after the fixing, and the hypo has either absorbed moisture from the air and thus become damp and stained by the silver in the paper. Or, maybe, the paper was not thoroughly dry when it was put upon the negative.

DOUBLE IMAGE ON FINDER.—P. MARKS writes:—"Can you please account for the following? In taking some sunset pictures recently, I noticed a double image of the sun on the finder; but, to my astonishment, when I developed the negative, the sun was all right. The finder contains a silver mirror, and the lens is ____'s?"—The thing is easily accounted for. The mirror is silvered on the back, and therefore reflects a double image, one from the surface of the glass and the other from the silver at the back. This double image is not noticeable except some bright object, such as the sun, forms part of the image.

EXECUTION OF ORDERS.—HORSHAM writes:—"About a year back I photographed a group of workmen. I submitted proofs to time-keeper, as requested; he wrote me in return to this effect: 'I've made inquiries among my men, and they wish one and a half dozen with ___, one dozen without ___, and half a dozen with ___. Now he returns a number of photographs, saying he can't dispose of them. I may say I was four weeks before completing order. Don't you think when I submitted proofs, and he ordered, were I to raise an action I should be successful? He says 'he bought nothing from me, but at my request he undertook to sell photographs.'—The question seems to be as to whether the time-keeper undertook to sell the photographs for you, or he bought them outright. Of that you are a better judge than us. If he bought them, you can recover, but not otherwise. We may say that four weeks appears to be a long time to keep such a small order in hand, and during that time it is probable that the passing interest in the group was lost, and hence the restricted demand for it. Orders for this kind of work should be executed promptly, while the interest in it lasts.

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EX CATHEDRÂ.

THE hundreds of readers who, during the last few years, have written us concerning the peculiar business methods of M. "Tanquerey," of Paris, will be interested in the following paragraph, which we take from the *Daily Mail* of the 17th instant: "Tanquerey, the notorious portrait swindler, who lives at 9, Rue de St. Pétersbourg, Paris, states that he is now in London. The police might give him a call, for his nefarious practices still continue. Tanquerey issues with his letters what he is pleased to call testimonials. Among these testimonials is an extract from the *Daily Mail*, taken from an article in which his fraudulent methods were fully exposed." If widely circulated newspapers such as the *Daily Mail* would persist in warning the public against parting with their photographs or their money to Tanquerey, something would be done towards scotching the ingenious, but disreputable, system of sharp practice on which this Parisian enlarging agency, with the tacit approval of Her Britannic Majesty's Post Office, obviously thrives. By the way, Mr. Vincent Crummles was

not a Prussian, and we are told that M. "Tanquerey" is not a Frenchman. He is of American nationality, and, if we are not misinformed, a very great deal of his bromide enlarging work is done in London.

* * *

THE *Electrical Review*, of New York, has made a somewhat tardy discovery. It tells us that an interesting experiment in photography by electric light has recently been conducted by a well-known New York photographer, and then supplies the following details of this very novel departure: "In attempting to take portraits by electric light hitherto it has been usual to employ arc lights, which generally have the effect of half blinding the sitter, causing a pained expression about the eyes, while the distribution of light cannot be so good as if the sources were more numerous and scattered than in the case of the usual arcs and reflectors employed. The new method employs incandescent lamps, which are attached to an umbrella-shaped contrivance placed over the head of the sitter. This carries twenty-two lamps, of which twenty-one are of 100 candle power each, and the other, at the centre, of 150 candle power. The umbrella is covered with white silk, tending to make a diffused radiation of the light. A few of the lamps are used in focussing, and, when all is ready, all are turned on, the voltage employed being about double that for which the lamps are rated. Under these circumstances the lamps burn with intense brilliance, giving a soft, pure, white light, aggregating about 5000 candle power for the whole device. With exposures from two to three seconds admirable photographs have been taken, showing good detail and the soft and diffused illumination which is such a desideratum in portrait photography." Of course, the use of incandescent electricity for photographic portraiture is no new thing, as every photographer quite well knows. In the system spoken of by our contemporary, the function of the centre lamp, and its high c. p. are not explained. But this may be the novel part of the experiment? From our practical experience of the matter, it would need very rapid plates and a large aperture of lens, to say nothing of extreme suitability of subject as regards colour, to enable the photographer to cut down his exposures to two seconds with a c. p. of 5000.

OUR contemporary, *Nature*, of last week, summarised some information as to the actual experience of nations who have adopted the metric system as given in a number of reports from Her Majesty's consular and other officers in Europe, which have just been brought together and published by the Foreign Office. "H.M. representatives in twenty-two States were asked to give information upon the following points: (1) The ease or difficulty with which the change of systems was made, the manner of introduction of the metric system, and the time occupied in making the change; (2) how far the metric system is satisfactory in its practical operation, and whether there is any desire to return to former systems; (3) as to the effect the adoption of the metric system has had upon the commerce of the nations adopting it. The answers received to these questions go to show that the best way to introduce the metric system is to make it compulsory after a specified period. The change from the old to the new system is slow in country districts; but, as new generations come on familiar with the metric measures, the old measures gradually drop out of use. In Turkey, the difficulties of enforcing the system upon an ignorant and illiterate people have proved insurmountable; but, in the majority of States from which information has been received, the system is becoming more extensively used every day. Once the system has been adopted, there is no desire to return to the old measures, and the effect upon commerce is always beneficial. In fact, the reports greatly strengthen the position of those who urge that the metric system should be adopted in England, if only for the sake of British trade." In England the metric system makes headway only slowly, for the Government lends little or no assistance to the agitation for its adoption; but so cogent an argument as the interests of British trade should not be lost on those manufacturers who still hesitate to put themselves in line with their foreign competitors in the important matter of weights and measures.

* * *

THE use of acetylene for photographic purposes has not become so great as was once thought would be the case, although it has been demonstrated that, for portraiture and small projections and enlargements, it is a safe and efficient illuminant to employ. The assumed danger in the storage of the carbide has resulted in the promulgation of municipal and other restrictions that have undoubtedly interfered with the full development of acetylene for lighting purposes. Time and experiment are obviously needed to educate the public into familiarity with a form of lighting probably no more dangerous in use than carburetted hydrogen or mineral oils. We are indebted to the Thorn & Hoddle Acetylene Lighting Company for some details of a strong test to which packed calcium carbide was put in the recent great fire at Ottawa. It is said that this disastrous fire settled to the entire satisfaction of the scores of insurance agents, inspectors, and adjusters who assembled at Ottawa in connexion with the fire losses, the question of risk from the storage of carbide.

* * *

WE are told that, when the fire reached the furnace room of the Dominion Carbide Works, everything in it that would burn was consumed. Three pigs of carbide in three crucibles remain in perfect condition as evidence that they did not explode. The grinding and mixing department and warehouses were in

another building. Every effort was made to prevent the fire from reaching it, but the terrific wind and the vast rush of flame enveloped every building in the vicinity, and they were in a few minutes reduced to ruins. When the carbide warehouse burned, everybody, incited by alarmists, looked for an explosion, but none occurred. In the warehouse were fifteen tons of carbide, packed in rolled steel cans with screw covers. When the floor of the warehouse burned, many tons of carbide dropped through into the cellar, in which a foot of water had collected from the firemen's hose. Several cans were broken in the fall, owing to the intense heat having melted the seams, and the carbide was dumped into the water. Gas was at once generated in immense quantities, but it simply burned with a low, steady flame, making less show than two piles of coke on fire, one in an adjoining chamber and another across the street. Had the cellar been dry, the carbide could all have been saved after the fire, but it continued to soak up the water and make gas for some days, and the burning gas kept the carbide so hot that it could not be handled. When the mass cooled sufficiently to enable men to work at it, about a ton of it was shovelled out and packed in new cans. Two of the cans were dug out whole from the hot mass and saved with the carbide, though the cans were burned like old worn-out stove pipes, but the carbide was uninjured. According to this account, which appears in the *Journal of Acetylene Gas Lighting* for July, a more severe test could hardly have been devised for showing that, when properly stored, calcic carbide does not explode even under the severest inducements. The *Journal* adds that the insurance agents who have examined into the matter now declare their conviction that carbide is not a dangerous fire risk. English insurance agents, we fancy, are less easily open to conviction.

QUICK-DRYING AND MOUNTING OF GELATINE PRINTS.

THE use of albumenised paper is, in very many studios, by no means yet abandoned, notwithstanding the many advantages and attractions of gelatine papers, P.O.P., and bromide. Its superiority is claimed still by some workers, and it has physical properties of its own, quite apart from the artistic aspect of the case, which will always tell in its favour. Not the least of these is connected with the subject we are now dealing with. An albumenised print once finished and washed can, if necessary, be taken straight from the washing water, dried, and mounted, and burnished if desired, ready for delivery, in less than five minutes; but under ordinary conditions this is quite impossible with a gelatine picture—print-out or developed. There is no fear of the surface melting if a little extra heat be applied to expedite the finishing, no sticking or injury to the surface if dried between blotting sheets or placed face down on the drying racks. In the ordinary course of business a professional photographer, if he be wise, naturally does his best to send out his orders quickly, but our remarks bear more particularly upon extra-ordinary work. A finished print, for example, is wanted for special reasons mounted and finished in a few minutes, or a batch of prints is required for the illustrated papers through a sudden demand for a particular subject. As a case in point we may give such an instance which came under our own notice. An important official dignitary suddenly died at eight o'clock one evening. The local photographer happened to have a negative of the place where he expired, but it was

getting late when he heard of the occurrence, and his post closed at ten. But before that time he and an assistant between them printed, dried, and mounted some sixteen or seventeen prints, packed them for post, and had them dispatched to various papers for publication purposes before the clock struck ten. This was quick work, as any would say who remembers the time taken in the mere act of packing and addressing, but it would have been utterly impossible without some quick process of drying and mounting. It may here be said that, when important pictures are sent to the papers for reproduction, the mounting is by no means essential; but where it can possibly be done we strongly advise that it should be, for the most eagle-eyed illustration-editor will find more attraction in a nicely mounted and finished picture than in a bare limp print.

Few things are more awkward to handle than a bromide print straight from the washing water; if it is dried between blotting-paper sheets, it will be inevitably spoiled; if it is not "bone dry," it will stick to the paper placed over it while rubbing down; if it is placed in front of the fire to dry, there is danger of its melting. All these difficulties, however, can be successfully battled with. The first point is the rendering the print less tacky, and, indeed, to make the surface insoluble. In the first case, if it be allowed to dry first and then be mounted, it is far more easily handled than if pasted and placed on the mount while still wet. But this would lose time; hence, for our purpose, it would be best to make the gelatine insoluble, and this can be readily done by means of an alum bath, but still better by one of formalin—one of two to five per cent. strength would be ample. The prints may then be handled without fear of sticking, and will bear with safety a considerable degree of heat. But the quickest and safest method is to immerse them in a dish of methylated spirit, press the spirit out by placing the prints in a heap and applying the squeegee, and repeating the process twice over, carefully separating them when placing in the fresh baths of spirit. At this stage, when all the water is eliminated, they will appear quite different from an ordinarily treated print; they will be semi-translucent, and, when the picture shows through the paper, it may be considered that all the water is dissolved out by the spirit.

The next step is, without waiting for the spirit to evaporate, to paste them on the back in the usual way for dry mounting, and then to dry them and finish by dry mounting. The advantage of the dry mounting is that, as soon as the print is made to adhere to the card, it can be safely sent by post without further treatment, and with no risk of sticking to the wrapper or accompanying letter. It may be added that, in the quick making and dispatching we referred to, no time is allowed for washing. The only object of washing is to ensure permanence, and this, when producing the print merely for making a block from, is of no consequence whatever, and where every moment is of importance one or two changes of water is all that is necessary.

Finally, we would point out the desirability of first conspicuously marking such unwashed prints as "non-permanent," and, secondly, taking care that all blotting sheets, if used for drying, are afterwards destroyed, for fear of contaminating future prints; that the paste brush is washed and the paste itself is rejected. These are trivial points, but such as, in the hurry of quick dispatch, might readily be lost sight of, to the material injury of future prints where permanency was a consideration.

The Bradford Meeting of the British Association.—So far the authoritative forecast of the proceedings does not show any subject connected with photography, but the meeting generally promises to be of remarkable interest from the many matters of importance and scientific interest. Possibly those interested in the optical side of photography may find matters germane to their study in the lecture on "Range-finders," by Professor W. Stroud, who takes the Monday evening for his subject.

Prizes for Colour Photography.—The French Society for the Encouragement of National Industry has published its programme of prizes and medals offered for 1901 and following years. Among them we notice that a prize of 3000 francs (120*l.*) is offered for the invention of a method allowing of the production of an indefinite number of positives in colours, either by a direct method or with a Lippmann negative. These prizes are open to persons of all nationalities. The theses must be sent in before the last day of the year, and be written in French.

The Great Photographic Star Map.—The work is going on apace, and the fourth meeting of the International Committee was recently held in Paris. The work is being vigorously pushed forward in all the observatories except those of Rio de Janeiro, La Plata, and Santiago (Chili), where it has entirely fallen through. The last two places have found substitutes through the generosity of the Argentine and Uruguay Governments respectively. In connexion with the estimation of photographic magnitudes is seemed to be the general belief that the estimation of diameters by means of a scale is a surer plan than that by means of a micrometer, but no definite ruling was given. The original plan was to make three exposures of thirty minutes each, but now the Directors are to be allowed to use their own judgments. The French observatories have made enlarged copies of the charts by heliogravure; but, as the carrying out of this method would involve an expenditure of some 10,000*l.*, its general adoption does not seem probable.

Photographing Sound Waves.—In *Nature*, for August 9, there is a long illustrated article by Professor R. W. Wood upon the photographing of sound waves, which is of the very highest interest, and should be read by all students of optics. It has a wealth of illustration, the diagrams being reproductions of cinematograph pictures taken of the actual sound waves themselves, the paper descriptive of them being devoted to showing the analogies of sound and light. These sound waves, as seen, are apt to become complicated, and cannot be well studied; but, by means of cinematograph pictures, their appearances can be made permanent, and studied at leisure. The chief apparatus consists of an electric spark-producer, a diaphragm for regulating the light, and a lens of high quality, which, for photographic purposes, should not be less than 6 feet focus. Professor Wood used the objective of an Alvan Clarke telescope. The wave is started by the production of an electric spark, and then, before it has left the field of view, it is illuminated by another spark. It is no good to give an extract of a paper on such a theme; those interested should obtain a copy of the periodical and study it at leisure. We predicate that they will rise from its perusal with a closer practical and theoretical knowledge of the paths of light rays, or, as Professor Thompson calls them, wave fronts, than it was likely they had before. We may add that lantern slides of these sound waves are now purchaseable from Messrs. Newton & Co., of Fleet-street.

The Weather of Last Month.—Some interesting details of the weather of last July are given in the number of the *Observatory* for August. We had three weeks of drought beginning July 6, and the great heat started on the 10th, the sunshine recorded being altogether 71 per cent. of the total possible. On the 10th it had the longest duration—15·3 hours, 94 per cent. of the utmost possible. July 25 gave us the highest recorded shade temperature since July 15, 1881—94° against 97·1°, this latter being the highest for close upon

fifty years. It is rather a singular thing that this month, as noted by a writer in the *English Mechanic*, was the hottest and the coldest for many years, the temperature at its commencement being far below the average. Notwithstanding the absolute drought for twenty-four days, the thunderstorms at the close of the month brought up the rainfall to the respectable aggregate of 1·41 inches. It needs no argument to show that such great meteorological variations are inimical to the interests of the poorest photographer. Ladies and children form usually the largest proportion of their clientele, and, as matters of dress are an important consideration, it is evident that such climatic vagaries must sadly interfere with their costume arrangements.

ON THINGS IN GENERAL.

THE notification copied into these pages that the photographic war correspondent, Mr. Shelley, intended to give a series of lectures on his South African experiences, together with the remarks in the *King* on the relation of illustrated literature to photography and art, leads, by a natural sequence of ideas, to thoughts of what photography has done for illustrated journalism. It is scarcely exaggeration to say that it has revolutionised this class of literature; but, at the same time, it has destroyed its art aspect. There is no call to rake up the embers of the old, old fire—the art *versus* photography discussion—but few will gainsay the statement that what, in its illustrations, journalism gains in exact delineation and verisimilitude it loses in art. So long as a photograph depicts a scene or a person interesting to the general reader, it is bound to be reproduced, however deficient in art feeling it may be, or however it sins against the recognised canons of composition of either lines or of lighting. The public wants a literal transcript; it will have it after the lines taken by the editor of a leading illustrated journal, who once informed a contributor who had sent a sketch of an Indian view, and complained about the introduction into an engraving from it of palm-trees, when none stood in his sketch or in nature, "The British public want palm-trees in Eastern pictures, and must have them." So, in its representation of current topics, it gets a literal transcript, and often a bad one at that, but it rarely gets art. Illustrated journalism is debased as much as it is popularised by photographic aid. The more is the pity.

To return to the subject that has drawn these comments, I recommend those of my readers who get the chance to hear Mr. Shelley not to neglect it. He is a real practical photographer, has had unrivalled experience, and withal is *bon camarade*.

As touching the relation of art to photography, the remarks of the writer in the *Studio*, as quoted in these pages, are interesting enough, but would have had more weight if he had aired his views on concrete facts, instead of his ignorance of abstract principles. "It is absolutely absurd," he says, "to attempt to reproduce an oil painting in printer's ink by the three primary colours, when not a single one of them was used by the artist in doing his work." In the first place the printer would be very glad if he could get the three primary colours in printer's ink, and, in the next, he could, by the aid of such colours, get every colour in the rainbow, or that ever appeared on the canvas or panel of an artist from Cimabue to the latest R.A. However, your critic who soars into the realms of art-cum-science is nothing if not cocksure. He has only one rival in that line—the photographic neophyte. We all know him, and his ally, the mere average photographer. They know absolutely everything, you can't teach them anything. What a delightful instance, for example, was on view at the L. & P. P. A. the other day. He had just started learning, yet he knew more than Mr. Philip Everitt of all others, and, to show this, he must need pillory himself by his aid at a recent meeting of this society, by its being proved that Mr. Everitt could teach him something.

The "art" men are very decidedly not having a good innings at present; the fielding is too strong for them, and the bowling most destructive. We have had a perfect plethora of downright straightforward Anglo-Saxon in, first, the "Bubbles" of Dr. Emerson, and, next, the views of Mr. W. Edwin Ward on the aesthetics of the

ambitious young men who had been exhibiting their lordly contempt of American work generally. There is no beating about the bush in these two combatants; they slash right and left in true manly, English fashion—they say what they mean, and they mean what they say—and what they do say is well worth reading, if only for the choice epithets they scatter, some of which, I think, will prove to have come to stay. What could be more to the point, for example, than "gum splodgers?" what more droll than Mr. Ward's "godlings?" I don't remember who invented the expression "a little tin god on wheels," of which this is a variant really he deserves a medal, for he and his disciples have enriched the language, for the expression lends itself to an infinite amount of variety, from the "little gods in glue," as applied to that terrible *vehmgericht*, the Plate-makers' Association, to the most recent creation, the godlings of the Linked Ring. There has been some correspondence lately about "Photographic Pests;" but, if it comes to be a question of eradicating pests, the one that could best be eradicated would be these writers who discourse highfalutin rubbish about tonalities and the rest of the studio argot, which only brings genuine photographers into common ridicule by artists.

To refer to the letter about "Photographic Pests," the writer can be sympathised with, and the Editor's comments are entirely justified as regards the expression employed and the position the papers take up, but there cannot be two opinions about the hardships suffered by local men through these touting brothers of the camera. If the opinion of all the professional photographers in the kingdom could be taken, there would be a nearly unanimous vote of condemnation of the system. No matter how well a neighbourhood is supplied with photographers of skill, the touts for groups are not restrained from calling. Once upon a time it was considered a degrading thing to employ a tout, but nowadays the country is flooded with touts. The paper was quite right to point out that these touts pay no rent, no local taxes, give no subscriptions to local charities. They simply scoop the money up and leave nothing whatever behind.

Let us turn away from this topic, and get to good practical photography such as, thank Heaven, we usually get, for instance, at the meetings of the L. and P. P. A. By the bye, who does the reporting for these meetings? I ask because there are sometimes to be read in accounts of the proceedings some very remarkable dicta as emanating from well-known men. Take for example a recent meeting where drying of dry plates was under discussion. Now, no one will accuse Mr. Henderson of knowing only a little about photography, yet in the pages of this JOURNAL for August 3 we have him reported as saying that a gelatine negative grew thinner as it dried. Now, taking these words in their ordinary sense, it is very improbable that Mr. Henderson said anything of the sort, for every practical photographer knows that a wet gelatino-bromide negative is far denser after drying than it is when fresh from the washing tank.

If we want further interesting matter of a really practical nature, the Answers to Correspondents column affords an endless fund of instruction, and, be it added, amusement. It is simply marvellous what mistakes and misfortunes come under the editorial eyes. I should like to discuss a few of them, to embroider, as it were, the editorial matter. Let us take the case of "Studio-building," replied to a fortnight ago. The writer says his studio used to have an angle of 35°, but he altered it to 60°, in deference to Mr. H. P. Robinson's teaching; but it has, since the alteration, given flat pictures. Clearly, therefore, he has not narrowed the vertical angle of the lighting area. Hence we may legitimately assume that it is a ridge roof with the ridge in the centre. But mark his figures: The studio is 10 feet wide, 13 feet to ridge, and 7 feet 6 inches to eaves. Yet he calls this an angle of 60°, which is perfect nonsense. A reference to any simple mathematical work containing a list of so-called natural tangents will show that it is as near as possible 45° only. For 60° to be obtained with 7 feet 6 inches eaves, his ridge should be over 16 feet instead of 13.

Then we have an inquirer about home-made platinotype paper. It is, of course, a very desirable and a praiseworthy thing to know by actual experience the details of making every prepared plate,

paper, or chemical employed in photographic work; but, if the writer hopes to be able to rival, even for his own use, the products of the immense works presided over by the Platinotype Company, he will quickly find out his mistake. Paper prepared sheet by sheet cannot possibly equal that produced in long bands; and, further, the selection of the paper itself requires knowledge and experience, only to be bought at much cost, as, no doubt, larger producers than the correspondent in question have already discovered. Finally, even in a mere question of economy there would be no gain. The paper as made for so many years is sold at a very low price considering what goes to the making of it.

I should like to end my remarks by a few words about the selection of a half-plate or a 5×4 , one-third size it used to be called years ago. Why is not the term reintroduced to avoid periphrasis? We have whole-plate, half-plate, and quarter-plate, yet, singularly enough, no one ever speaks of third-plate size! Well, our correspondent asks which is best, half or one-third size. Few will be inclined to disagree with the Editor, who prefers half size. But there is one most important consideration in regard to this matter that is rarely, if ever, alluded to. Let us suppose that for a one-third size (5×4) a lens of six-inch focus is deemed a good one for all-round purposes, then at the same ratio a half-plate should be provided with an eight-inch (or nearly). Now, anybody with practical experience knows that an eight-inch focus lens is far too exacting for ordinary snap-shot work. Six-inch focus is trying enough, but an eight-inch would be very unsatisfactory for street scenes. For instance, the very fact that the point beyond which all objects are in focus has to be almost double the distance for an eight-inch that it has to be with a six-inch (1'7" exactly), brings it practically under the category of "long-focus" lenses. Particular attention should be given to this phase of the question, one so generally ignored, if not lost sight of.

FREE LANCE.

BRITISH AWARDS AT THE PARIS EXHIBITION.

LAST week, in replying to the question of a correspondent, we stated that there would be no awards for British photographs at the Paris Exhibition. Simultaneously with the publication of the JOURNAL in which our answer appeared the official list of the Paris awards was issued, and, to our surprise, we discovered that we had erred in the matter. But there were good grounds for the view we took that no prizes would be given to British photographs as distinct from apparatus and scientific exhibits. The space reserved for the exhibits from this country was so absurdly small that a thoroughly representative exhibition could not possibly be organized on the basis of an open competition. The Royal Photographic Society and the Camera Club, having wisely declined the invidious task of selecting a few "technical" and "pictorial" photographers to represent the whole of the United Kingdom at Paris, the work, at the invitation of the British Commission (a body which with characteristic South Kensington incommunicativeness has kept the photographic public in complete ignorance as to Exhibition matters), was undertaken by General Waterhouse and Mr. Craigie. These gentlemen, as we have before acknowledged, acquitted themselves well in a difficult and thankless task. It would naturally appear that, as photographs for competition were not invited by the Paris Executive, no awards would be bestowed. The exact opposite has, it seems, proved to be the case; and, in view of this unexpected result, we can only regret once more that some authentic information on the matter was not forthcoming last winter, when the work of invitation was taken in hand.

The list of awards for British apparatus and photographs, which we print below, is probably neither perfectly complete nor quite correct; but, as we are at present at work in sylvan surroundings, where no sources of verification exist, we are forced to rely upon telegraphic extracts from the not ideally accurate official list published last week.

Class XII.—Photography.—Grand Prix: Royal Observatory, Greenwich. Gold medals: Autotype Company; Ross, Limited; J. H. Dallmeyer, Limited; W. L. H. Skeen & Co.; Captain E. H. Hills, R.E.; W. Watson & Sons; T. & R. Annan; Penrose & Co.; Newman & Guardia. Silver: E. J. Spitta; C. S. Cochran; F. H. Glew; McKenzie Davidson; Meisenbach Company; F. W. Bois; F. Downer & Sons; T. Manly; W. Norrie; Werner & Sons; W. J. Byrne; James Lane (of Watson & Sons). Bronze: C. P. Butler; R. N. Wolfenden; Lascelles & Co.; Strand Engraving Company; W. P. Marsh; Raithby, Lawrence & Co.; Carl Hentschel; R. B. Lodge; Hort Player; Lafayette.

In Class XI. (Typography) the Grand Prix was awarded to Messrs. Waterlow & Sons; a gold medal to Messrs. Bemrose; a silver to Messrs. W. H. Ward & Co.; a bronze to Messrs. Penrose & Co.; and a gold to Mr. W. Gamble.

In Class XV. (Mathematical and Scientific Instruments) gold medals were awarded to the Cambridge Scientific Instrument Company and Messrs. Ross, Limited. The foregoing are the names of the principal British prize-winners; but the list before us is none too clear, and we have no opportunity of submitting it to revision. As compared with 1889, the number of awards is very much larger. We congratulate the recipients, who possibly will not over-rate the value of prizes which signify much less than they might.

It cannot be pretended that the value of an award at a modern universal exhibition is quite what it appears to be. The juries are notoriously guided by precedent in distributing the honours placed at their disposal. Firms who, in the years 1878 and 1889 exhibited in Paris and secured awards, were certain beforehand of similar recognition this year; and so it happened, as any one who cares to study the foregoing list and compare it with those issued eleven and twenty-two years ago, may see for himself. In the case of firms which have stands of goods, amongst which a shield of previously obtained medals figures prominently, the jury frequently consider it unnecessary to submit the exhibits to examination. It is enough for them to know that the jury of 1889 considered a medal properly bestowed in a particular instance; and the addition of another award may be interpreted as an official expression of satisfaction that the particular firm still continues in the ranks of exhibitors, and appreciates the efforts of the French nation in holding an Exposition. French houses to whom medals are awarded at foreign exhibitions find favour, if we are correctly informed, in the eyes of the Government, and a number of industrial successes of this kind often meets with reward in the shape of the bestowal of one of those coveted little bits of ribbon which indicates enrolment in the Legion of Honour.

We order these things differently in this dear country, of which the Government is supremely indifferent to the success or non-success of English traders at foreign exhibitions. With regard to the gold, silver, and bronze medals awarded at Paris, in the case of the first named, if we are correctly informed, an actual disc of the precious metal is not handed to a victor. He receives a paper certificate, which entitles him to prepare a gold medal—that is all. If he be wise, and wishes to include the medal amongst those that adorn his shield, he has an imitation made at the cost of a few shillings. Eight thousand gold medals were awarded at Paris. Let these be figured out at five or ten pounds a piece, and it will be seen that the cost would run into a very handsome sum, a sum which we do not think this by no means successful Exhibition could afford to disburse. Finally, we may say that in the foregoing list of awards there appear some names to which, in a suburban London exhibition, no distinction of a medal would be attached, according to the most modern lights. British photography at Paris was not well and representatively shown, and the plethora of awards is therefore all the more surprising.

THE ELEMENTS IN FORCE AND MATTER.

[Translated from the *Deutsche Photographen Zeitung*.]

If we consider the philosophical and scientific conceptions of various ages at different periods of their history, we find great diversity in their ideas concerning the elements of nature. At one time the elements are primary, and form the constituents of all other substances; at another time they are forces, by whose functions substances are brought into existence. There have even been philosophers who reduce all that surrounds us to the imagination of the "Ego."

It is a mere supposition, yet behind the philosophy of the shadowy past there may be a lost science higher than that of modern times. It is indicated by the idea of a primary substance, to which we are again aspiring through the more recent discoveries of modern science. We refer to the fundamental proposition of the unity of nature, whether in substance or in force. Perhaps both these conceptions may be resolved to functions of the same primary power.

It is certain that the universe is pervaded by a force which we call ether. It transmits to us the light of the stars, conveys their power of attraction, and unites electricity and magnetism conductively.

The vast infinity of number, time, and space is derived from unity, and not only number, time, and space, but also force and matter, are formed from unity.

The old philosophers affirmed the fundamental proposition of the unity of existence and of force. This may have been derived from thought

but it may also have been a revelation of nature, of which we are part but, as science grew with its wealth of observation, the various phenomena were connected and defined, and it became necessary to classify the various properties of matter and its forces by uniting those which were related to each other and separating those which differed. In this way the forces of light, heat, electricity, gravity, &c., were discovered and studied, and the same also applies to matter and the elements.

If we observe the forces—light, heat, and electricity—in their various manifestations, they seem to be, and really are, interchangeable. From heat in its higher manifestations light is evolved, and from their combined action electricity or magnetism. These latter again evolve light and heat. Can these be different independent forces? Assuredly not. Nature in its vastness cannot be so complicated. These phenomena are but different manifestations of one and the same force.

In chemistry we meet with various elementary substances, such as metals—gold, silver, iron, &c.; the metalloids—chlorine, bromine, iodine, &c.; and the gases—oxygen, nitrogen, hydrogen, &c. We continue to discover other elements, and describe them chemically as simple substances.

But it is remarkable that we also find in nature certain well-known compound substances which behave as elements in their combination with other substances and exhibit all their characteristics. For example, we describe ammonia as a compound formed by nitrogen and hydrogen, but as an element, "ammonium," it behaves the same as other metals, and even forms an amalgam or alloy with mercury. In all its combinations it acts quite normally as an element.

As another example we have cyanogen, a compound of nitrogen and carbon. This also behaves in combination with metals exactly the same as the elements we call halogens—chlorine, bromine, iodine, &c. We have cyanide as well as chloride of silver, and in this respect cyanogen behaves as an element the same as chlorine.

Thus we have two definite instances in which compound bodies possess all the characteristics of elements, and this would entitle us to infer the opposite of the other elements, and conclude that they also are composite in their nature.

In 1881, Ciamician, of Vienna, in studying the spectrum of the elements, observed a similarity which points in the same direction.

This similarity, which also finds support in the atomic weights of the elements, relates to the various lines of certain elements which appear to be merely a displacement of those of the preceding series.

If we take the following series with their atomic weights,

Lithium,	Sodium,	Potassium,	Rubidium,	Cæsium,
7	23	39	86	133

we find a similarity in their spectra as well as in their atomic weights. The difference between the first three is 16, which is the atomic weight of oxygen.*

Similarly, if we take Magnesium, Calcium, and Iron, and their atomic weights, 24, 40, 56, we again find homology of their spectra, with a difference of 16 in their atomic weights, which is that of oxygen.

Less striking homologies of a different kind are found in the series chlorine, bromine and iodine, and phosphorus, arsenic, and antimony.

It would be a daring inference to conclude from this that sodium (23) is formed of lithium (7) + oxygen (16), and that solium (23) + oxygen (16) is equivalent to potassium (39); or, taking the second series, that iron (56) is formed of magnesium (24) + 2 parts of oxygen (2×16), or calcium (40) + oxygen (16). It would be a daring assumption, but the numerical relationship is striking, and we find still more remarkable connexion between the elements in these series if we examine their chemical properties.

Lithium, sodium, potassium, rubidium, and cæsium are alkali metals with ascending affinity for oxygen, as though they desired to unite.

If we take the whole series of the alkali metals with their properties and atomic weights, we find

$$\frac{7+39}{2} = 23, \text{ and } \frac{39+133}{2} = 86,$$

which might be explained thus:—

$$\frac{\text{Lithium, } 7 + \text{potassium, } 39}{2} = \text{sodium, } 23, \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{Potassium being common to both equations.}$$

and

$$\frac{\text{Potassium, } 39 + \text{cæsium, } 133}{2} = \text{rubidium, } 86.$$

* The difference between potassium and rubidium, and rubidium and cæsium, is also approximately 48, or 3×16 .—TRANSLATOR.

Lithium burns when heated in the air, and decomposes water by abstraction of oxygen, but without ignition.

Sodium decomposes water readily, and is attended by combustion 60° C. Potassium ignites upon contact with water. The last member the series, cæsium, is absolutely unstable in contact with air.

We might add considerably to these proofs, but we desire to pass on the latest discoveries of science in this direction.

We have already referred to possible combinations of elements with oxygen, and resultant higher atomic weights. If we now take the nitrogen group, we find the following relations:

Nitrogen, atomic weight, 14	2	= 76.5, arsenic, approximately.
Phosphorus, 31		
Arsenic, 75		
Antimony, 122		

But, apart from these numerical relations, we have chemical and physical analogies, and, what is of most importance for our theory, the results of highly interesting and important experiments by Professor Fittica.

This savant of high reputation has proved by exact experiment that arsenic is a compound formed of phosphorus with nitrogen and oxygen, and, moreover, that antimony is another such compound. He has produced arsenic and antimony directly from phosphorus by the action of compounds of nitrogen and oxygen.

If we make a calculation for these, we find—

$$\text{Phosphorus, } 31 + 2 \text{ nitrogen } (2 \times 14) + \text{oxygen } (16) = \text{arsenic } (75).$$

$$\text{Phosphorus, } 31 + 4 \text{ nitrogen } (4 \times 14) + 2 \text{ oxygen } (2 \times 16) = \text{antimony } (121).$$

Is not this sufficient? On the one hand we have spectroscopic analysis and certain speculations, and on the other definite practical proof. By such means the whole of our system of elements is reduced to a few primary substances.

But our theory will remain defective until experiment adduces the proof that there is but one single element. Call this what we may, universal ether, primary force, or what not, we are at last brought back to the beginning, and are forced to say, "Darkness was upon the face of the deep, and the Spirit of God moved upon the face of the waters."

Out of darkness came light, from light all that is visible, and the entire universe is but a complex whole.

A. COBENZL,
Chemist, Wiesloch (Baden).

MAFEKING BANK-NOTES PRODUCED BY PHOTOGRAPHY.

The *Daily Telegraph* last week published an interesting account of the production, by photography, of the bank-notes circulated in Mafeking during the famous siege. We are told that Mafeking's currency was a matter which was promptly taken in hand by the authorities when war had been declared, and Baden-Powell's paper money is already as famous as General Gordon's Khartoum notes. The system of exchange and payment of labour worked admirably throughout; it may even be said that the siege of Mafeking paid itself. But the economic machinery did not work smoothly without taxing the resource and ability of Colonel Baden-Powell and his coadjutors.

It is well known, proceeds the account in our contemporary, that the first paper money issued was a series of notes for 10s., 3s., 2s., and 1s. These were printed on ordinary paper, and, as coins disappeared, buried, to a large extent, by the natives, they became the established currency. The main inscription ran: "This voucher is good for a sum of ____." Then, during the last three months of the siege, Baden-Powell issued his celebrated 1l. note, in exchange for gold, repayable "on the resumption of civil law." Interesting details of the production of these documents we owe to Mr. E. J. Ross, one of those who took his share of the siege, and the actual printer of the notes. Mr. Ross has recently returned to England on a short visit, and brings with him a unique collection of photographs, 550 in number, and two or three volumes of documentary relics. It was to Mr. Ross, as an amateur photographer, that Baden-Powell turned when the proposal of the notes was first mooted. The first difficulty, that of the design, was no difficulty at all in face of "B.P.'s" versatility of talent, and a sketch was quickly prepared. In an unfinished state—half pencilled and half in ink—it was placed before Mr. Ross's camera to see what could be made of it, and the result was sufficiently satisfactory to induce the self-appointed artist to finish it. The question of printing had next to be considered. There was little or no sensitised paper in the town, and none could be manufactured, for there were no eggs to supply the albumen. An ample store of note-paper existed, however, and, with the aid of a photographer's manual, Mr. Ross succeeded in preparing a ferro-prussiate solution. Then, with sheets of thick vellum or note-paper, of which a sufficient supply was found, the

wherewithal to print from the plates was achieved. As evidenced by Mr. Ross's specimens (which a representative was privileged to see recently), the chemical took very well, and not alone from the artistic point of view, the one-pound note was a triumph of the siege. "B.-P.'s" design, simply and directly composed, sums up in itself the history of the defence of Mafeking. The central figure, a kneeling woman with a child in her arms, represents the helpless inhabitants of the town, and grouped around are the instruments of her salvation. Above her waves the Union Jack; a rifleman of the Protectorate Regiment stands erect; on the extreme right is one of the loyal Dutch—a bearded sniper; on the left a member of the gallant Town Guard similarly engaged; the little brass and steel howitzer Wolf gapes ready for action, with a pile of the home-made 4½ in. shells lying beside her. As a child of the siege this gallant piece of ordnance has a rightful place in Baden-Powell's emblematic picture, but it is to be feared that the erratic time-fuse made her shells more terrible in discharge than in execution. With Lord Nelson and her other companions—a quintette of old crocks—the Wolf now enjoys a well-earned rest in the market square of Mafeking. It was in the same quarter, at the back of his former business premises, that Mr. Ross carried out his operations for providing the town's currency. The work-room was just a dug-out, and it was called the Mafeking Mint, while an inscription, "No admittance," warned off the prying strangers, for Captain Greener, the paymaster, had lost a batch of the earlier vouchers. In his mole-like surroundings Mr. Ross turned out the notes at the rate of twenty a day, until in all a total of over 500 had been taken up by the public in exchange for pounds sterling. They were redeemable by the Standard Bank at the end of the siege, but the remarkable fact has to be recorded that not one of them has been presented. Among Mr. Ross's specimens of the one-pound note is an unnumbered one, which is endorsed "cancelled," and happily illustrates the kind of "stratch" material which went to their manufacture. Near the edge are embossed in red the mysterious letters "B. B. P.," surmounted by a crown. The explanation is that among the note-paper used was some of the old official stationery of the Bechuanaland Border Police, and an embossed sheet had been inadvertently printed in the Mint's dark room.

THE INVENTIONS OF EMPLOYES.

For the following article, by Mr. D. W. Brown, we are indebted to our contemporary, *Invention*, which reproduces it from *Power*. It deals with an interesting subject of constant recurrence in photographic manufacturing: In general, the law secures to every man the ownership of his own inventions and of the patents granted therefor. But this general principle is much modified by the special relations existing between the *employé* and his employer in particular cases. A wide distinction is made between the person who is employed merely as a skilled workman and the person who is employed as an inventor.

As to the former: If a skilled workman, while in the employ of another, but in his own time or after hours conceives an invention and constructs it at his own expense, using his own tools and materials, and doing the work after hours, or in time his employer does not pay for, then the invention, as well as the patent, is the exclusive property of the workman. The employer has no rights in it, nor any rights to use it in his business, even though it is adapted to that business. The employer, in this case, can obtain the right to use the invention only by contracting with the workman for it, and paying the price agreed upon.

But, if the workman conceives the invention in the time his employer pays for, and constructs it with his employer's tools and materials, and in the employer's time, then the employer obtains certain rights in the invention and patent granted therefor. If the invention is a machine, then the machine belongs to the employer, and he has a licence to use it in his business and to keep it in repair, and without paying any royalty to the workman therefor. If the *employé* obtains a patent for the invention and sells it, that sale will be subject to the licence to the employer, and the purchaser of the patent cannot prevent the employer from continuing to use the machine.

If the employer is running a machine shop, for example, and, after the patent is granted, converts his business into a corporation, so that the corporation is rather the continuation of the old business than a new concern, the licence to use and repair the machine continues over to the corporation. If the invention is not a machine, but is an article of manufacture, as a tool in which the employer deals, then, in the circumstances supposed, the employer has a licence to make and sell such tools without paying royalty, even after the patent is granted; and neither the inventor nor the purchaser of the patent can stop him from continuing to do so.

In this case also the employer's licence continues over to the corporation into which the employer's business is converted.

If the invention is a process, then the employer, or the corporation which continues his business, has a licence to use that process, without paying royalty, even after the patent is granted to the workman. In these cases, however, the licence to make and sell the machine or the article, and to operate the process, is not exclusive—that is, it does not give the sole right to the employer—it only secures to him a right to the invention in connexion with his particular business; and the inventor, or those to whom he sells the patent, can make, use, and sell the invention, and license others to do so, without let or hindrance from the employer.

As to persons employed to invent: If a person is employed by another to make inventions to be used in the employer's business, and is paid salary or wages on the understanding that his services are to be those of an inventor in improving the machines, tools, or processes which relate to the employer's business, then the invention which the *employé* makes relating to that business, and the patents granted therefor, are the exclusive property of the employer. In such cases, the court says that the *employé*, in making and perfecting inventions, is merely doing what he was hired to do. Should the *employé* leave that employ, he cannot use, or make, or sell the invention, or convey any rights to others under it, except with the consent of the employer.

Related to the question of the rights of employers and *employés* to inventions of the latter is that of the rights of the one to conceive an invention, and of the skilled workman who is employed to perfect it. In general, if A conceives an invention (which includes an idea of means to put it into operation) and employs a skilled workman, B, to perfect it, then A, and not B, is the inventor of the whole machine, article, or process, including any merely subsidiary inventions which B made in developing A's ideas, and A alone is entitled to the patent. If, however, the idea merely occurred to A that it would be well to do a certain thing, and he had no notion of the means to do it, then B is the inventor. A's rights as a licensee under, or owner of, the patent, will depend upon the special relations between A and B, as above considered, or upon the express contracts between them. But the applicant for the patent must be B.

It is unfortunate that the relations of *employés* and employers are often such as to prevent an explicit understanding between them, at the time the invention is being developed, of just what their rights are to be. Influenced by what seems their present interest in "keeping quiet," and trusting that something will happen that will enable them to secure more than the law will give them on the facts at the time, both parties avoid definite understandings, until after a lapse of time, when the real facts are forgotten, and perhaps the invention is becoming important, both, unconsciously or consciously, distort the facts in their own interest, and serious disagreements arise, which sometimes wreck the business and almost always injure the *employé*.

The security of both the *employé* and the employer requires that the relations of the parties should be explicitly agreed upon when the invention is developing, and that the terms of the agreement should be committed to writing.

"FREAK" PHOTOGRAPHY IN AMERICA.

THE following three extracts from the American contemporaries named below complete the series of criticisms that have been published during the last few months in the United States on the subject of "freak" photography, as it is called there. Almost every photographic journal published in America has ridiculed these productions—the like of which was frequently seen in London a few years ago—and we may therefore reasonably hope and expect that this weight of opinion will have the effect of ridding Transatlantic exhibitions of a kind of "photograph" which could hardly have been the productions of perfectly sane persons.

Mr. Edward W. Newcombe, in the *Camera*, writes: "It seems to me that a hundred dollars is something of a price to ask for a photograph, even a most extraordinary one. Yet there was such a price asked at the Chicago Salon, while others were priced nearly as high. Now, I don't believe any one wanted those prints at ninety-five per cent. reduction. The press seemed to entertain the same opinion, and what we, who are uninitiated, would like to know is, what the idea was in putting such ridiculous figures on the aforesaid prints. Did the price lend dignity to the Salon, or were the pictures such extraordinary freaks that the owners couldn't bear to part with them, and so put prohibitive prices on them? Do any of my readers think that a hundred dollars will ever be paid for a print from a negative? and, if not, will some one please inform me

what else but vanity and self-conceit ever prompted the makers of these prints to ask as much for work that both press and public laughed at openly as a reputable painter would for a good canvas? That is one way to 'elevate' photography—reduce the royalty and raise the price. In other words, 'sand the sugar, water the rum, and come in to prayers.' Notoriety at any cost made the reputation of P. T. Barnum, who, I believe, said, 'Have the public talk about you; well, if possible, but have them talk any how,' and it was the same man who declared that the public dearly loved to be humbugged. Perhaps we do, perhaps we do, but do we want to be taught advanced photography, the new school, by people who use humbug methods to gain notoriety? Are those methods what we want to convince us of the legitimacy of a kind of photograph we and nearly everybody else failed to understand? Would it not be better, more sensible, to give up the bluff, place the pictures at auction, and let a discerning public put the legitimate market value upon them? Then, if they fetch a hundred dollars, it might be very wise of us to kneel down to and become disciples of these exponents of the 'new photography.'

The editor of the *Camera and Dark Room* thus interrogates his readers: "What is it? What shall we name this off-shoot from our beautiful art that prevails at the modern photographic salon? It is not photography! It is not art! The spread of this spirit of namby-pambyism has been illustrated at some expense by the editor of the *Photo-Beacon* in his June issue, which is given up to the Chicago Photographic Salon. We agree in the main with brother Todd's critique on the what-shall-we-call-em's, but he is too lenient. Why, in all dizziness, is such work held up as an example? A technically perfect photograph of nature in any of her moods is a picture, and valuable in that it perpetuates the passing scene. An ideal may be conjured and aptly illustrated; this is art, a picture that tells a story. The first style of picture is within the reach of most all painstaking photographers; the second is the *pons asinorum*, where so many make the miss-step from the sublime to the ridiculous. Why will people with a reputation for making good photographs hold themselves up to ridicule by exhibiting trash that has no excuse for existence, and why, oh, why will Judges hang the picture (save the mark!) and not the perpetrator? A knowledge of the first elements of drawing, of light and shade, values and perspective, would have saved us many of the exhibits. Others that look like an amateur's first attempts, with all the faults enlarged, may be funny, but they should not be held up as objects of emulation. It would take more whisky than is good for the system to put a level-headed man in the condition to see nature as some would-be artists would have us see it. That this delirium-tremens style of art, which originated in aesthetic London, was aped in New York, and garbled in Philadelphia, should have found support in the practical Western city is sad to contemplate. Where will it stop? And, before the next Salon, if this is to continue to be held up as the pattern of success, we earnestly hope the Judges will answer the question, What is it?

That usually astute critic, the office-boy, is sent by the *Photographic Times* to "do" a modern Exhibition, presumably at Chicago or New York. "Rusty"—for that is the lad's name—delivers himself in this manner: "Say, she's hot stuff, ain't she? But it wasn't anything like I thought it would be. Not many good pictures there, like I used to burnish up at Greggs'. A lot of fellows were goin' daft over some pictures by an English fellow with a kind of an automobile name—A Horseless Winton, or something like that, but I didn't think they were so much. A dude with an eyeglass and several ladies were ravin' over a set of pictures that the dude was the author of. They was all out of focus, and it would make you dizzy to look at them for a minute, and they looked as if they had been taken through a telegraph-pole insulator or the bottom of a beer bottle. Somebody ought to buy that duck a good camera with one of them anti-stigma lenses, like yours. There was another fellow there that had evidently got 'turned down' by the jury, for he just rippin' up everybody and all the pictures, and sayin' that they didn't any of them begin to compare with his own. I heard him tellin' another fellow that after this he wasn't goin' to throw any of his spoiled negatives in the ash barrel, but was goin' to keep them to print pictures from for the exhibitions, because he said the spoiled negatives of one year would produce the prize-winners of next year's show." Here "Rusty" was called away by the ringing of the telephone, but he returned immediately and continued: "But, say, what silly titles they give some of the pictures, and how badly they fit. One fellow had a picture of a sickly-looking girl holdin' something in her hand and looking sad, which he called *Woman with a Vase*. I heard a couple of girls talkin' about it, and they called it a 'voz,' but it was vase in my catalogue all right. *Woman with a Grouch*, *Man with a*

Jag, or *Child with the Measles*, would be more appropriate for some of them than the titles that were printed in the catalogue. And say, some of them landscapes looked as if they had been printed from the wrong side of the negative. One pointed bearded artist fellow was snickerin' at a fright that was labelled *The Weary Day is Drawing to a Close*. And it was certainly the weariest-looking day I ever saw closing. Before I ever went to work for Griggs I'll bet I could have made a picture like that with my shoe-brush and some of Bixby's three B's blacklin'. That fellow's business may take him out at the hour when a landscape might look like that to him, but I would have to be comin' home about three o'clock on a rainy morning with a good comfortable jag on board to see nature look like that chromo. There was another freak there that was so bad that the fellow who took it couldn't look it in the face and name it, so he just called it *A Study*. After 'studying' it for about a half an hour, tryin' to make out what it was, I had to give it up, but I think it was either a gipsy girl or a picture of General Shafter, although it did look like a picture of Columbus that used to be in the Second Reader when I went to school down —" Just at this point a man called in to pay his subscription, and while he was out hunting up the Business Manager, I couldn't help but think that, in his way, "Rusty" was, doubtless, something of a genuine philosopher, as well as a clever, faithful office-boy.

COMPACT STEREOSCOPIC CAMERA.

[Translated from the *Photographische Mittheilungen*.]

ANY one who owns a pocket Kodak, and can borrow another from a friend, may readily extemporise a stereoscopic camera by combining them. They should be placed side by side upon a piece of wood taken from a cigar-box, or upon a piece of cardboard, of the size of the base of the two cameras. They may be attached to it by an indiarubber band. The camera is then quite ready for snap-shots, and the shutters may be released by pressing simultaneously upon both buttons with the two thumbs.

But it will be necessary to connect the two releases for time exposures. This will also be found convenient for instantaneous work, and may be effected as follows: Take a strip of wood rather longer than the spaces separating the two releases, and notch the side at each end to make it fit on to both triggers. The piece of wood should then be placed in position upon the cameras, and secured by a second indiarubber band passed round both. It will then only be necessary to push the piece of wood from right to left, or vice versa, to release both shutters simultaneously. I would not have troubled my friends with this trifling addition to the amusement obtained from a Kodak if the results had not been so surprising.

The small photographs may be seen to good advantage in any ordinary stereoscope, but it is far preferable to look at them in one made expressly for the purpose. It is possible to make a suitable stereoscope with very little trouble from three pieces of cigar-box wood, arranged like a footstool to support the picture. The optical arrangement consists of two simple lenses (magnifiers) of about 7 to 8 c. focus which are permanently fixed at the average separation of the eyes (68 mm.). The distance between the lenses and the pictures should only be slightly less than the focal length. It is preferable to place the pictures in position provisionally before mounting them, so as to avoid exchanging the right and left, and likewise to adjust them so that they combine perfectly.

Readers who are familiar with the stereo cope will understand that pictures viewed in this manner will have a far more realistic appearance. The secret depends principally upon the fact that the lenses of the stereoscope correspond in focus with the lenses of the cameras, and the rays transmitted to the eye consequently seem to come from the same distance as the objects. In addition to this, the pictures, on account of their small size, may be examined with lenses of considerable magnifying power. The apparent field of vision and the parallactic difference are consequently larger than in an ordinary stereoscope, and this determines the stereoscopic effect.

One is astonished at the effectiveness of these small pictures. Details which were invisible stand out with remarkable distinctness. The smallness of the pictures is entirely forgotten, and all the advantages of the stereograph are obtained in undiminished degree. In conclusion, I wish to emphasise the fact that the manipulation of the process is very simple. It is not necessary to develop both pictures at the same time, and their density may differ considerably without impairing the effect.

The inconvenience and expense of a stereoscopic outfit interfere with the popularity of this branch of photography, and if these few lines bring new friends to the ranks, as I trust they may, they will have served a good purpose.

ROBERT DEFREGGER.

A COMPARISON OF DEVELOPERS IN ORDINARY USE.

[Translated from the *Photographische Mittheilungen*.]

THE following tables show the composition of the developing solutions in general use and their comparative cost:—

A.—SODA DEVELOPERS.

Per Litre of Water.	De- vel- oper.	Cryst- al- lised Sul- phite of Soda.	Meta- bisulphite of potash.	Soda.	Compar- ative cost, hydro- quinone being=1.
	Grammes.	Grammes.	Grammes.	Grammes.	
Hydroquinone	5·0	33	—	50	1·0
Pyrogallol	9·3	66	—	33	2·1
Eikonogen	12·5	50	—	38	3·1
Metol	5·0	50	—	50	3·3
Ortol	7·5	90	4	60	4·8

B.—POTASH DEVELOPERS.

Per Litre of Water.	De- vel- oper.	Cryst- al- lised Sul- phite of Soda.	Meta- bisulphite of Potash.	Carbo- nate of Potash.	Compar- ative cost, hydro- quinone being=1.
	Grammes.	Grammes.	Grammes.	Grammes.	
Hydroquinone	5·0	30	—	50	1·0
Pyrogallol	2·8	64	—	13	0·8
Pyrocatechin	10·0	40	—	50	3·0
Eikonogen (E. Vogel) ... " (maker's formula) ...	12·5	50	—	40	2·5
	30·0	120	—	50	5·6
Para-amidophenol	6·7	40	—	40	3·4
Metol	7·5	75	—	25	3·8
Glycin	8·0	40	—	40	3·9
Ortol	7·5	90	4	30	3·9

The comparative cost, as given in these tables, should not be taken as representing the absolute cost in practical use, the relative density and stability in use being important factors, which must also be taken into consideration. It is well known that hydroquinone, which we have taken as the unit, gives great density, and oxidises slowly; but, on the other hand, when freshly prepared, it is more prone to veil than some other solutions, such as pyrocatechin and glycine, and it loses energy at low temperatures (under 14° C.). The old ferrous-oxalate developer is about twice as expensive as the hydroquinone developer mentioned above.

The potash developers are more rapid in action than the soda developers, and may therefore be used with more water for many kinds of work.

H.

THE PHYSIOLOGICAL EFFECTS OF MODERN PHOTOGRAPHIC DEVELOPERS.

[Translated from *Der Amateur Photograph*.]

CONSIDERING the enormous popularity of photography, and the consequent wide-spread use of developing solutions, it is important to review their physiological effects by the light of experience.

Developing agents are offered to us in commerce either as colourless powders or small crystals. They are dissolved for use in water, and alkaline salts are added. These solutions are brought into contact with the hands and fingers of the operator. It is, of course, a very seldom occurrence that developers, in their original state or in solution, are taken into the stomach. But it is desirable, nevertheless, to take this opportunity to point out that many of our modern developers, and especially pyrogallol, must be classed with poisons. But it is of greater interest to the photographer to learn the conditions under which alkaline solutions have a deleterious effect upon the skin of the hands and fingers, causing painful inflammation often difficult to cure. Experience has shown that few persons exhibit a decided susceptibility to the action of developing solutions, and it has likewise been conclusively established that the alkali, as well as the developer, is capable of acting upon the skin. In the majority of cases that have come under observation, there can be no doubt that the alkali was the cause. With regard to the developing substances, only one is known to have caused inflammation, viz., metol, and that only in a few cases.

It is by no means unimportant which alkali is used in making up the developing solution. Developers like amidol, which are rendered active with the weaker alkalies, such as sulphite of soda, may be considered

harmless. There is no case on record in which the amidol developer has been the cause of inflammation. Not until we come to the alkaline carbonates, such as soda and especially potash, do we meet with any complaints, and it is noteworthy that those developers which require a considerable quantity of alkali are the more troublesome, whilst those with which little alkali is used, such as eikonogen or the more recent imogen-sulphite, may also be regarded as harmless. When the caustic alkalies are used there is increased danger, but here we must also discriminate and ascertain whether the alkali combines with the developer and forms a phenolate, or merely mixes with the solution. Rodinal is a characteristic example of the former, as only sufficient alkali is used to convert the para-amido-phenol ($C_6H_4\overset{OH}{NH}_2$) to phenolate (C_6H_4ONa). (See the instructions for the use of para-amido-phenol.) In this way the corrosive action of the caustic alkalies is diminished and their deleterious effect upon the skin reduced to a minimum. The case is quite different when the developer does not combine with the caustic alkali and form a salt, as, for instance, when para-phenylenediamine ($C_6H_4\overset{NH_2}{N}H_2$, meta-carbol) is used. Such developing solutions are as strongly alkaline, and have the same corrosive effect, as a solution of caustic alkali of corresponding strength. It is scarcely possible to work long with these developers.

MAKING AND PAINTING BACKGROUNDS.

DURING the winter months the photographer must always have slack days. Knowing this, it is surprising that so few make preparations to occupy the enforced leisure in the profitable pursuit of background painting. I could instance professionals who use the same background day after day, month after month, until its constant appearance in every portrait cannot but make their clients rebel, seeking novelty, and a rival photographer.

One of the leading professionals, noted for easy and graceful portraiture, is not above painting a special background to suit the individual sitter, or half a dozen for as many different subjects; and the enthusiast who can follow this example is certain to rise above men who remain content to buy two or three backgrounds yearly, using them mechanically for every composition.

Want of skill in drawing is the first obstacle to discourage the majority of photographers, and it is a matter of regret that they pay so little attention to this art, when it should be regarded as an essential part of the training of every operator; until it is so regarded the painted background will remain unsatisfactory, since it is an aid in portraiture that can only be properly utilised by each worker painting his own.

The background gives style to a picture, it being remarkable how the individuality of a man will appear in his work if he uses backgrounds painted by himself. The style of a painter can also be caught by copying his backgrounds, and using them in a portrait. Gainsborough, Reynolds, Lely, or any of the old portrait painters with a marked style, may be imitated by such devices. Some of the work of the above-mentioned photographer is of this character, and his mastery of natural and simple posing is so complete that his imitations have all the spirit of the originals. It is a practice scarcely to be encouraged, though its success is a proof of the photographer's abilities. Professionals may often, however, employ it as an attractive novelty.

Elaborate backgrounds depend for success on power in drawing. Apparently the work is very free; actually it requires considerable artistic skill to produce the effect aimed at. With absolutely no knowledge of drawing, one can still make plain or clouded grounds; and, since the practical treatment is alike in both cases, the following description will be confined to the latter, leaving the worker to express his artistic notions according to personal taste and the accepted rules of lighting and composition.

Preparing the Calico.—The first need is calico of the kind known as "sheeting," this being usually stocked by drapers, the width ranging from 72 inches upwards. It may be of the bleached or unbleached variety; also of such a length that it consists of a single sheet, without seam or join, of the size of background required. If it is to be used on a roller, a rough wooden frame should be made to hold the sheet during the colouring operations. For convenience of working it is best fixed against a bare wall, taking the precaution of having a framework two inches in depth to keep the calico well away from the wall; otherwise, in subsequent processes, it may slacken and stick at the back. For a stretched background, a well-made frame of the usual kind, of wood not less than two inches square, will be needed. To allow of tacking along the sides it is as well that the sheet lap over the framework two inches all round.

The calico is next affixed, the work being done in one particular way. The sheet is laid over the frame, and first secured at the centre of each of the four sides, pulling it tightly across, driving the tacks along the

edge, and not into the front. These points secured, the tacking is continued from the centres towards the corners, keeping the calico quite tight, and inserting the tacks a few at a time on each side in rotation, finishing up at the corners simultaneously. By this method the sheet can be evenly stretched, and all rucks and creases avoided.

Sizing.—The calico is now ready for sizing. A best-quality whitewash brush, one having long, flexible hairs is obtained; this is not a cheap article, but to use an inferior brush is to court failure. The common size used by decorators is employed; it is put into a convenient vessel, just covered by water, and dissolved by means of a slow heat. The exact strength is not material, but it should be of such a consistency as to flow easily over the sheet. When dissolved, the solution is strained through canvas to remove all particles, and finally applied, whilst still hot, to the calico. The application must be regular, the brush being worked in all directions, taking special care that every part of the surface is touched. No bare spaces must be left, nor the size put on in patches. This done, it is left to dry for about twenty-four hours. Some prefer to apply two coats of a very thin size, though this is not necessary if a single coat is put on with care. Enough size is melted to cover the whole sheet; roughly, a background eight feet square will soak up from a half to three-quarters of a house-pail of solution.

Mixing the Colour.—The next step is the actual colouring. For a plain background the proper shade is put down at once, whilst for a scenic background the middle tone is first put on, and the lighter and darker details worked in afterwards. For general photographic work, lampblack, whitening, and ultra marine blue are the only powders required, as every shade of slate colour can be obtained by mixtures of these.

The whitening is placed in a pail, covered with water and left to soak and dissolve. Meanwhile the lampblack and blue are made into pastes with water on a stone slab by the aid of a palette knife, and are ground down to a smooth creamlike mass. The whitening, after being well stirred, is allowed to settle, and the superfluous water poured off. The lampblack and blue are then added to the whitening in the right proportions to procure the shade of background that is wanted. As all powders dry light, the wet mass should appear much darker than the finished colour is to be. On this account it is advisable to spread a portion over some surface, leave it to dry, and thus secure a guide to the depth of the final shade. The correct shade arrived at, a solution of hot size is added to the mixture until it becomes sufficiently fluid to apply with the brush. This, in practice, means that it will be hardly so thick as cream, and yet not so watery as to run when put on the calico. The proportions usually taken are one pound of size to three pounds of whitening and colour. Some recommend using the mixture when cold and in a jellied state, but in my experience the hot mixture is more simple to deal with. Before use the colour, while at its hottest, is strained through a coarse mesh to remove any impurities.

Applying the Colour.—The whole secret of background painting consists in the method of laying on the colour. A common, stumpy brush is of little use, for a whitewash brush having a good spring is a necessity. To ensure success, a platform must be erected, in order that the upper part of the background is within easy reach, and making it possible to pass rapidly from one end to the other. The platform ought also to admit of quick removal, so that the lower half of the background may be immediately accessible. Enough colour to cover the whole calico should be mixed, which will mean about the same quantity as for the sizing. Have the solution almost boiling, and, when ready, commence at the extreme top of the frame. Move the brush in every direction, working quickly downwards, and always keeping a good flow of colour in the brush. In no case must the edge of the colour be left to become dry; this is a most important point, for every such dry edge will show as a streak in the finished background. Make no pause in the work when once started, and keep the edge of colour across the whole background continually moist. With a very large surface it is as well to have two persons working together. Taking these precautions, the surface, when dry, will present a uniform tint without a trace of inequality.

Shading and Drawing.—On such a ground any darker tint, having a sharp outline might be laid down in a similar manner. To produce shaded effects more skill is needed. The straightforward way is to work them in whilst putting on the ground. This demands an assistant, one worker starting at the top with a pail of light colour, whilst the other commencing from the bottom, or any given direction, with a pail of another shade, and when one approaches the other the two are skilfully blended. As a rule, backgrounds are shaded from top to bottom, though the choice is not limited to this one method, for the plain shading of backgrounds might rise to an art.

Any one who wishes to really learn the possibilities of a plain surface under artistic treatment should study the bare walls so often seen in paintings of the Dutch school. It is scarcely correct to call them "bare walls," so full are they of shadows and delicate gradations that lift them into the region of art. Certain it is that the pillar and curtain enter largely into the scheme, not for themselves, but rather as a means of throwing shadows on walls, to secure the needed relief. It may be that many photographers use like accessories for the same object. Following along these lines, we might have backgrounds shaded in many different ways, as various indeed as the shadows which fall upon the walls of a room.

On a plain ground many subjects can be sketched with chalk and charcoal. It is not recommended, as the powder is apt to rub off, and chalk is far too glaring. The better plan is to mix powders with size, and use them as ordinary paints. A pure white is employed with caution, and, in general, the high lights in a background should be in a much lower key than in ordinary colour painting. The cheap background of commerce is usually in far too high a key, being much improved by toning down.

A final point needing some attention is the position objects depicted in a scene are to occupy. Photographers often think some natural view would make a good background, but a very small proportion of natural "bits" can be pressed into the service. In nearly all cases some angular object cuts the outline of the sitter. For ordinary studio work it is as well to leave a bare space in the centre of a background, and to merely suggest accessories at the sides. Another course is to avoid all abrupt lines by shading surrounding objects into the space around the sitter's position. A third method is to paint one half of a uniform tint, to pose the subject against this, and to fill in the remaining part with slight detail.

Scenic backgrounds have been somewhat overdone by the professional, and, in my opinion, much finer effects in portraiture could be composed by following the Dutch painters in utilising the simple shadows obtainable upon a bare, uniform surface—a system, that is, of straight-line shading in contrast with the clouded background now so much in vogue.

JOHN A. RANDALL

PRACTICAL HINTS ON COPYING.

ONE of the most trying parts in work of this description, when operating away from home, is generally found in the difficulty of so adjusting the camera that the sensitive plate is placed exactly parallel to the plane of the object. To many at first sight (especially those who have never had work of this description to undertake) this may appear a matter of but little difficulty, for most handbooks on photography refer to this matter, and are generally found giving the advice that, by drawing a series of upright lines on the ground glass of the camera, and then so adjusting matters that the outline of the object exactly coincides with such marks, the object will be rendered true in form. No doubt, in some simple cases a procedure of this description will meet the requirements of an operator, but for really serious work, in different situations and under most trying circumstances, something more certain in the way of operating is required than the guidance of lines on the ground glass of the camera.

Take, for instance, the case where a panel, or, say, an oil painting has to be photographed in the position it occupies when against an ordinary wall (for in numerous instances they have to be dealt with without removal from where they are situated). Very probably the light is dim and it is a matter of considerable difficulty to distinguish the sombre colours both of the object and their surroundings. In such a case as this some trouble is entailed in so arranging for the plane of the object being absolutely parallel to the sensitive plate when working by means of lines on the ground glass, for no sooner does one proceed to rectify some apparent distortion in one direction than one immediately introduces an error in another.

When dealing with large plans or maps, or such subjects as contain well-defined outlines running round the extreme limits of the object, the adjustment of the two planes so that they are absolutely parallel to each other is a matter of the utmost importance indeed, for the slightest deviation will become painfully evident by the distorted shape in the copy. This is sometimes noticeable by one end appearing narrower than the other, or being wider at the top than the bottom. Some careless workers may say, What does it matter? by trimming the print square such distortion is not seen; but this argument is only a poor excuse for slovenly workmanship.

Of the numerous methods employed to ensure the two planes being parallel, mention may also be made of drawing parallel lines on the floor of the studio, or by employing the seams of the planking, when this runs fairly parallel to the wall of any room upon which the subject is held *in situ*. These expedients, however, are only clumsy makeshifts, and merely provide for an approximate parallelism in one direction only, and, further, are of no avail when the work has to be done in situations outside well-appointed studios, or in rooms where such facilities do not exist.

In photographing small objects, such as ordinary photographs or book illustrations, these difficulties do not arise, simply by reason of the fact that the merest tyro knows how to employ some copying board, upon which are ruled, at equal distances, parallel lines, and by so placing the upright carrying the object to be copied on one of such lines, and then the camera on another at any distance from the upright, the two planes are easily made parallel to each other. It is when working away from home on large objects that real difficulty arises, and then an operator wants some reliable and simple method of guidance.

On several occasions, when discussing this matter with clever workers, the writer has been forcibly impressed with the variety of opinions expressed as to the best method to employ to ensure success in this particular branch of work. In the main, however, the remarks generally

ended up by saying, "Get the object square on the focussing screen." Yes; but how? The answer to which clearly indicated that there was almost complete ignorance regarding a splendid little dodge which, when brought to bear upon work of this description, made the adjustment of an object to the sensitive plate a matter of easy accomplishment. This little dodge was known to a few workers of the old school nearly thirty years ago, but the secret has been well kept, or, at least, so far as the writer is aware, it has never been divulged in any of the handbooks or guides to photography, of which we have at present so great a number.

I remember on one occasion having a large quantity of oil paintings to photograph in an art studio or, rather, show-room, and had placed at my disposal for the removal of the different pictures an expert picture-cleaner, who had many years' experience in dealings with oil paintings, and, as he expressed it, "standing by" when they were being photographed, so as to render any assistance that was required. On my arrival to begin operations he had already made preparations, admirable enough in their way, no doubt, for the very purpose of dealing with the difficulty under discussion. These embraced the nailing down upon the carpet of the show-room of a number of lengths of narrow white tape, each length being about eighteen inches apart. On my expressing thanks for the kindness and trouble he had taken in the matter, but stating that I did not require such guides, he seemed surprised, and said, "That's the best way I ken o', and I haen't seen a ween photographers working in my day." On my remarking that no doubt the white tapes were very useful, but that there was a much easier method, he said he would like to see it; and so, on his promising to keep my method of working a secret, I showed him the following little dodge, with which he was forcibly impressed.

Of course, in all well-appointed picture show-rooms or studios there are always to be found plenty of block easels. These at once permit any size of painting being held vertical, or with a small amount of tilting, either backwards or forwards, if desired; but, as a general rule, the exact position will depend upon the direction of the lighting. A top light, however, pure and simple, means the picture being held on the blocks vertically. The camera stand is then arranged (a tripod is of no use in work of this description), and, where the services of a good camera stand cannot be requisitioned, then the next best thing to employ is the services of one or two good packing-cases, wedged up so as to form a rigid support for the camera.

The picture and camera being situated at the requisite distance from each other, according to the size of the image required, the rest is easy; should, however, there be any alteration in the distance of the object from the camera, it is always best to move the easel, not the camera stand. In this there will be no difficulty, for all these high-class easels run on casters, so that, even with a heavy framed picture, they are easily wheeled into any position.

The dodge which the writer has found so easy and simple to secure the two planes being parallel to one another consists in using a small tool, that he has termed "a dry level." Any one can make it for themselves in a few minutes; it consists of a square flat board with a round peg in the centre.

The following description of the one the writer employs may be read with interest by readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. In making this, let a flat board be provided, ten inches exactly square by half an inch thick. When absolutely squared, draw lines from each corner to the opposite corner. These will cross exactly in the centre of the board. At this central point, by means of a carpenter's brace and a sharp bit, bore out a round aperture of one inch diameter. Now provide a piece of round wood, such as a good broom handle, and cut off a length of about three inches long. Of course the diameter of the peg must be such as will enable its fitting nicely into the cut-out aperture, and the ends must be cut square to the plane of the board. Let this round peg be inserted in the cut-out aperture, and, if the surface of the flat board be painted black, then must the projecting end of the round peg be painted white, or *vice versa*. The reason for this will soon be obvious.

Possessed with this little tool, we are now in a position to easily bring the two planes into a parallel position. To do this, by means of two strings, or any other simple means, hang the board so that it lies flat on or near the centre surface of whatever is being photographed. This done, proceed to examine the end of the round peg on the ground glass of the camera. If the planes are parallel, there will be a true circle seen on the focussing screen, and it is a good plan to have the centre of the focussing screen marked with a number of circles; this is easily done by means of a lead pencil and different stops of a lens; with any of these circles the peg will appear distorted if the planes are not parallel.

The whole thing is so simple that with a very little practice the least deviation is at once detected. I cannot at this distance of time remember where I first saw this dodge used or given. I rather think the credit for it lies with a Continental photographer, but I do know that I used it some thirty years ago, and I have found it invaluable when dealing with objects such as we are describing.

Oil paintings, as a rule, are best photographed without their frames; but, of course, circumstances will arise where, as is the case when they have to be copied on a wall, the frames require to be included; this often means employing kitchen tables and other homely articles in rigging up stagings for the camera, and in cases where the pictures are tilted forward, and the

corners of the wooden gauge or level cannot be inserted over the canvas, I have generally resorted to holding the peg over the surface of the painting by hand.

There are several other old-time dodges which seem to have dropped out of notice in these go-ahead days of snap-shot work, but which are of much value in all-round working.

T. N. ARMSTRONG.

SOME RECENT PATENTS IN COLOUR PHOTOGRAPHY.

DR. GUSTAV SELLE'S IMPROVEMENTS IN COLOUR SCREENS.

[Patent No. 12,515 of 1899.]

DR. SELLE says: "By reason of its purity and transparency collodion tinted with proper colouring is particularly adapted for light screens but in its normal condition it contracts so strongly upon drying that a net-like surface results which has a disturbing effect on the sensitive plate. I have found that this can be obviated if normal collodion be reduced by a suitable attenuant until the viscosity and molecular attraction is enfeebled to an extreme degree without at the same time destroying cohesion. I achieve this by treating normal collodion with an excess of ether or other substances having the same attributes. Taking for instance a three per cent. collodion I dilute it with about fifty per cent. of ether. With such solution I incorporate colours combining capacity of concentration and correctness of tint with extreme purity, transparency, and luminosity. For the blue filter I use a mixture of blue and red, gentiana blue and fuchsin or other colours having the same tints and attributes.

"For the green filter I use an admixture of emerald green and auramin yellow or other colours with the same tints and attributes; for the red filter I use a mixture of fuchsin red and saffron yellow or other colours having the same tints and attributes: after covering glass plates with a layer of such tinted collodion by flooding and pouring off the excess the filters must be dried in a heated atmosphere (say about 60 degrees Celsius) to prevent irregularities in drying and a separation or precipitation of the colours which would otherwise frequently take place."

DR. SELLE'S IMPROVEMENTS RELATING TO THE SENSITISING AND RELATIVE SENSITIVE ADJUSTMENT OF PHOTOGRAPHIC PLATES FOR USE IN COLOUR PHOTOGRAPHY.

[Patent No. 12,516 of 1899.]

The patentee says: "The ordinary gelatine plate being perfectly adapted for exposures to the blue rays it is only the other two plates that require suitable preparation.

"For exposure to the green rays I employ a gelatine plate which I sensitise for green by immersion in a bath consisting of a solution of a red colouring substance, for instance the well-known erythrosin. But the solution must be so proportioned that apart from more colour sensitiveness the plate should both by itself and in relation to the other plates yield the equality above described.

"To this end and without prejudicing sensitiveness there should be sufficient resistance to the property of green rays to abundantly penetrate a silver plate so that a correct ratio between penetration and the formation of the image may be established. Taking for instance erythrosin I use a solution of 0·005 per cent. in water but other sensitising agents may be substituted provided they fulfil the same conditions.

"The plate to be exposed behind the red filters needs to be sensitised with a combination of a red and blue colouring substance although either is by itself sensitive to the red rays. If a red sensitiser only were used most of the red rays would be reflected without being absorbed, thus the formation of a proper image would be prevented; on the other hand the blue sensitiser alone would be far more sensitive to the purely red rays than to the orange, so that incorrect contrasts and values would result; moreover it presents no obstacle to the property possessed also by red rays of penetrating abundantly a silver plate. By combining the two sensitising agents and moreover in such a manner that their defects are rendered inactive which best results if the blue sensitiser be superimposed on the red, a balance is created which not only ensures the absorption of the total rays within the group, but establishes the necessary ratio between rate of absorption and formation of image.

"To achieve my object I use as a sensitising bath, for instance, a solution of say 0·002 per cent. of cyanin blue and erythrosin in a fluid composed of sixty per cent. water and forty per cent. alcohol. By this means the red dye which is more soluble in the water is carried into the film, while the blue dye which is more soluble in alcohol remains substantially on the surface of the plate. But other sensitising agents having the same properties or result may be used.

"It will be seen from the aforesaid that apart from the sensitising of the plates individually my principal object is to obtain the proper adjustment of the three negatives to each other and it is obvious that other methods of sensitising than those described may be used so long as the same necessary adjustment is achieved.

"Owing to the difference in actinism each of the plates requires as already mentioned a different length of exposure. Nevertheless by observance of the method of sensitising herein described the reduction of the time necessary for exposure of the 'green' and the 'red' plates can be very greatly reduced below that formerly necessary.

"Given an identical light, electric light for instance there is no trouble in observing the necessary proportions but in daylight this is frequently very difficult."

"I assure exact proportionate exposures irrespective of variations in light by timing the exposures according to the gyrations of a radiometer (light propelled mill) which revolves faster or slower according to the intensity of the light playing on it."

"The exposure is directly proportional to the number of revolutions per second of the radiometer. The first plate exposed is the plate behind the blue filter, such plate requires hardly more exposure than the ordinary plate in ordinary monochrome photography and the necessary time for exposure of such plate is ascertained by means of an actinometer or similar contrivance and the number of revolutions made by the radiometer having been counted this will constitute the basis for estimating the number of revolutions necessary for the green and red plates. Assuming that the exposure of the 3 plates stands as 1 for the blue, 3 for the green, and 18 for the red and that the exposure required for the blue plate is in accordance with the actinometer, equivalent to 3 revolutions in a second then the exposure for the green plate will be equivalent to $3 \times 3 = 9$ revolutions of the radiometer and the exposure for the red plate will be $3 \times 18 = 54$ revolutions."

DR. SELLE'S IMPROVEMENTS IN FILMS FOR COLOUR PHOTOGRAPHY.

[Patent No. 12,517 of 1899.]

Dr. Selle says: "I use extremely thin layers of gelatine which on account of their fragility and also for the purpose of superposition are supported on collodion films. The effect of using such extremely thin gelatine is that the latter remains practically unaffected by the subsequent baths and those parts on which the light passing through the negative has acted undergo a chemical change whereby the bichromated gelatine is so to say converted into a mordant capable of attracting the colouring matter held in solution by the baths; moreover the combination imparts a satisfactory degree of permanency to otherwise fugitive colours such as the aniline dyes. It is obvious also that on account of their thinness the films when superimposed allow of an equable and luminous blending of the three colours. My present object is to describe details giving the best results. I have found that the strength of gelatine solution to be used should be one between 5 and 7 per cent. preferably 6 per cent. when poured on a rigid surface such as glass or suitably mounted paper and the excess allowed to drain off there will result a film of about 0'0015 mm. in thickness. A stronger solution would give not only a thicker and therefore less luminous film but also a somewhat blurred and dirty picture. On the other hand a weaker solution would not provide a sufficient hold for the colouring matter and would consequently yield a pale and feeble image. The bichromate sensitiser used (for instance, ammonium bichromate) should be a solution from 2·5 to 3 per cent. strong; if a stronger solution is used say 4 per cent. the sensitiser will generally crystallise giving an unserviceable surface; on the other hand a weaker solution say 2 per cent. would yield a weak image since the colouring matter cannot bite sufficiently. It is also desirable that the plate should drain off at a temperature of about 40° Celsius and not exceeding 60° otherwise the gelatine by drying too quickly would prevent an even draining off and a layer of unequal depth results."

KUNY'S PROCESS FOR COLOURING PHOTOGRAPHIC PICTURES.

[Patent No. 18,594 of 1899.]

A TRANSPARENT sheet (gelatine, paper or the like) is attached to the film side of the negative by means of a transparent adhesive substance (gum arabic, gelatine or the like).

The sensitive layer or film may be of asphalt or chrome gelatine coloured with pigments corresponding to the local tones of the original. In case the asphalt method be employed, the colours must be rubbed with turpentine oil and filtered. Several glazing or transparent colours are suitable for use; in most cases Parisian blue, sienna earth and carmine suffice. If the chrome gelatine method be employed, colours must be selected which are not attacked by chromate and which may be dissolved or rubbed in water. The colours in this case also are added filtered. Preferably the above-mentioned colours are employed, although numerous others are capable of being used.

The coloured solutions are applied to the transparent paper or gelatine after the latter has been coated with gum arabic or the like transparent and easily soluble adhesive substance and the coating has been dried, in such a way that in the case of a portrait, for instance, flesh tints lie over the face, whilst brown or the like tints lie over the hair.

After the whole surface has been coated with the asphalt or chrome gelatine film in a non-actinic light and dried in a dark chamber or a yellow light, the negative is reproduced on this layer by exposing it to light without removing it from the film. The use of a special printing frame is therefore not necessary, as by the transparent sheet being stuck on the negative a firm whole is itself formed. The picture is then developed in the ordinary manner and dried, after which the transparent sheet together with the picture may be drawn off the negative.

The copy where asphalt is used is developed with turpentine oil, whilst a copy where chrome gelatine is used is developed with warm water.

In order to facilitate the drawing off of the picture from the negative, the latter is rubbed with wax, paraffin, or the like, before the transparent sheet is stuck on.

In sticking on, the edges of the negative plate are preferably overlapped by the transparent sheet, in which case, before drawing off the picture, these edges must be first cut off.

The transfer of a picture to another medium or foundation for the purpose of developing is unnecessary, because the copying takes place from the side of the film (gelatine or paper sheet).

A "positive" results from the process. It has colours corresponding with the local colours of the original, and is perfectly coated on the under side with toned white colour. It is then conveyed in the ordinary manner on to cards or the like, after which the transparent sheet may be removed, as it was coated with gum arabic or other soluble adhesive substance, as before stated, before the emulsion was applied. This drawing off of the transparent sheet takes place when the positive produced is fully dry, for which object the surface of the transparent sheet is suitably moistened, so that after some little time it can be drawn off. By this means the coloured surface on the positive is entirely free, so that it produces the impression of a painting. The sticking of the transparent paper or the like on the negative has as a consequence the following advantages:—

1. The transparent sheet fits thoroughly on the picture film, so that a thoroughly smooth surface is thereby afforded.
2. Displacement of the transparent paper arising from variations in temperature or moisture or even by accident in using a copying or printing frame are entirely excluded.
3. In consequence of the adhesive substance the paper is uniformly transparent.
4. A copying or printing frame is rendered unnecessary.

Our Editorial Table.

THE USEFUL ARTS AND HANDICRAFTS SERIES.

Edited by H. SNOWDEN WARD.

London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

THE completion of the twenty-fourth number of this series of little books, which deal in a practical manner with the minor arts and crafts, gives us the opportunity of again drawing attention to them. The first twelve numbers have already been referred to in our pages. The subjects dealt with in the second part of the series are as follows:—

- No. 13. Church Decoration (Permanent). W. T. Whitehead.
- No. 14. Church Decoration (Temporary). W. T. Whitehead.
- No. 15. Home-made Lathes. J. J. Holtzapffel.
- No. 16. Fret-cutting. "Jack Plane" and C. G. Leland.
- No. 17. Repoussé and Metal Chasing. C. G. Leland.
- No. 18. Tools and How to Use Them. Thomas Bolas and C. G. Leland.
- No. 19. Soldering, Brazing, and the Joining of Metals. Thomas Bolas.
- No. 20. Wood-turning for Amateurs. Rev. F. C. Lambert.
- No. 21. Cycle Repair and Maintenance. A. W. Marshall.
- No. 22. Etching on Metal; Niello and Metal-inlaying. T. Bolas and C. G. Leland.
- No. 23. Stencil-cutting and Stencilling. "Jack Plane."
- No. 24. First Steps in Painting and Colouring Engravings. C. E. Dawson.

Each book is plainly written, the instruction matter is devoid of superfluous language, and the illustrations are well drawn and reproduced. For self-instruction in many branches of handicraftsmanship this series will be found of real assistance. The books are sold at the low price of 6d. each, and the bound volumes make excellent gift-books for persons of manipulative skill or training.

THE BARNET BOOK OF PHOTOGRAPHY.

Published by Elliott & Son, Barnet. 257 pp. Price 1s.

MESSRS. ELLIOTT inform us that, since the first publication of this book in May 1898, they have sold over 25,000 copies. The edition before us is the fourth, and, besides the inclusion of twelve pages of formulæ, it has some new illustrations in half-tone. Such a popular volume is bound in due course to reach a fifth edition, and we suggest to Messrs. Elliott—one of the most enlightened and progressive firms in the photographic trade—that this would afford a convenient opportunity to express the formulæ throughout the book in metric as well as Imperial equivalents. "Every little helps," as the familiar saying runs, and even such a comparatively small industry as photography, by employing metric weights and measures, can do something to promote British trade in the manner suggested elsewhere in this week's JOURNAL.

The frontispiece to the book is a Barnet bromide print—a beautiful example of the process—from a negative by the Duke of Newcastle. There are fourteen articles by qualified authors, and about a dozen pages of half-tone illustrations. It is worthy of note that Messrs. Elliott evince great breadth of view by including an article on "Platinotype Printing" in their book. The other subjects dealt with are "Alpine Photography" (Abney), "Negative-making" (C. H. Bothamley), "Lenses" (Chapman Jones), "Portraiture" (Harold Baker), "Pictorial Photography" (A. Horsley Hinton), "Architectural Photography" (J. H. Avery), "The Hand Camera" (W. Thomas), "Lantern Slides" (Pringle), "Enlargements" (Hodges), "P.O.P." (F. C. Lambert), "Carbon" (Skelton). A really good book, tastefully produced, and worth double what is charged for it—one shilling.

MESSRS. R. & J. BECK, Limited, of 68, Cornhill, E.C., are issuing a little catalogue of eight pages, which gives the prices charged for fitting the Beck-Steinheil orthostigmat lenses to Frena and Kodak cameras.

THE NATIONAL DRY PLATES.

We have received a sample of this brand of plates from the National Photographic Company, Cromwell-road, Southampton. This series, the Instantaneous, we find easy to manipulate and very sensitive. They are well coated and remarkably free from blemishes; and, as they are prepared by a well-known photographer of great experience, they promise to earn a reputation among the many popular brands now upon the market. We observe a novel recommendation in the instructions for use which deserves attention, although there are great objections to the general use of cyanide of potassium. The makers recommend flooding the plate with a 10-grain solution of cyanide of potassium after fixing and slightly washing. Ten minutes' subsequent washing will then suffice.

NEW KODAKS.

Manufactured and sold by Kodak, Limited, 43, Clerkenwell-road, London, E.C., and branches.

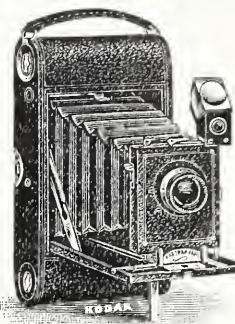
THE Panoram Kodak was introduced to the American photographic public last year, and in the JOURNAL, several months ago, we wrote appreciatively of some half-tone reproductions that we had seen from negatives made in the new camera. The appearance of the clever little instrument on the English market has been well timed, for it is the kind of camera which the autumn tourist, in particular, may be trusted to scan with a covetous eye. The narrow view, $7 \times 2\frac{1}{2}$ inches, including an angle of considerably over a hundred degrees, and looking so much, if we may so express it, like a rectangular slice out of a natural scene, is just the kind of photograph upon which the gaze of the traveller would approvingly rest. The eye, in lens parlance, is a mid-angle instrument; but, when it comes to human consciousness, as distinct from human perceptiveness, it is another thing altogether. We most of us see, or think we see, panoramically, and photographs that are taken by means



of a mobile optical system seem to have, with the majority of people, a far more satisfying effect than views of less extensive angular inclusion.

This week the No. 1 Panoram Kodak was our companion during some loiterings in the Thames Valley between Chertsey and Windsor, and we have nothing but praise for the simple manner in which the instrument can be worked. River scenery in particular lends itself to great angular subtention, and there are parts of the beautiful region we have named that cannot be satisfactorily represented by the aid of, say, a five-inch lens working on a baseline of three or four inches. The Panoram, we may state for the information of those who have not yet tried it, is absolutely no more trouble to work than any other camera of the Kodak series. The film is bent round a curved surface, thus presenting a concave field to the lens. The shutter being set by the movement of the lever on top of the camera, the front flap is dropped, and, the centre of the image being located on the finder, the exposure is made by the pressure of a metal button, which releases a spring that allows the lens to swing concentrically to the curved film. This is really all the photographer is called upon to do, and it will be seen that it differs very little from the familiar Kodak formula. Besides the finder, the camera has a spirit level, and the shutter has two speeds, quick and slow instantaneous. The Panoram Kodak is a beautifully finished little machine, and it is well worth the 50s. charged for it. It is bound to be a very popular instrument.

THE series of Kodak cameras has been further extended by the inclusion of a "No. 3 Folding Pocket Kodak." This takes $4\frac{1}{4} \times 3\frac{1}{4}$ size photographs either vertically or horizontally, has a doublet lens, focussing scale in yards and metres, can be used on a stand, is fitted with a finder, gives time and instantaneous exposures, and admits of the use of glass plates. Withal, there is no sacrifice of portability as compared with



other cameras of the folding pocket series. The quarter-plate Kodak should be welcomed by the devotees of "regular sizes," and it is sure to be appreciated for its compactness and convenience. But the Panoram, like Mrs. Chickenstalker's muffins, has "come so pat" that we predict a great run on it. Certainly, it takes our fancy very strongly indeed. And, now, when may we expect a stereoscopic camera to issue from the wonderful workshop at Rochester, oh, mighty Kodak?

CATALOGUE RECEIVED.

R. J. Moss, 97, Great Hampton-street, Birmingham.

THIS catalogue treats in detail of acetylene gas apparatus for house lighting, the optical lantern and enlarging, cycle lamps, &c. The section which is of purely photographic interest is not the least important part of the catalogue, and a large variety of generators and jets are illustrated.

News and Notes.

THE PARIS EXHIBITION.—The list of exhibitors recompensed includes no fewer than 42,790, and among these are distributed nearly 3000 grand prizes and 8000 gold medals.

WE regret to learn that, on account of continued ill-health, Mr. W. Thompson has been compelled to resign the Hon. Secretaryship of the Newcastle and Northern Counties' Photographic Association.

IN reprinting from the *Journal of the Royal Photographic Society* the paper, "A Simple Method of Obtaining the Conjugate Distances of a Lens," we omitted the name of the author. It is the Rev. F. C. Lambert, M.A.

THE Chancellor of the German Empire has issued an ordinance to the effect that the Réaumur thermometer will not be admitted to official control after January 1, 1901. This will lead to the exclusive use of the Centigrade thermometer in Germany.

INTERRUPTED PHOTOGRAPHY.—An extraordinary accident happened in the Abbey Field at Colchester one day last week. The 4th Battalion Essex Militia had constructed a trestle bridge over a wide gully, and the men were so proud of their work that 150 of them posed upon the structure and were photographed. Subsequently other groups were photographed, but, when the last batch was being snapped, the bridge collapsed, throwing sixty militiamen down twelve feet. Happily, not a single man was seriously hurt.

SERIOUS ACCIDENT TO A PHOTOGRAPHER.—Mr. W. Passmore, a native of Sidmouth, and carrying on business at Moreton-Hampstead as a photographer, was on Wednesday week cycling down Stonehill Hill, Willand, when he was seized with a fit and fell to the ground. Medical assistance was at once summoned, and he was removed to the Tiverton Infirmary. On the way, however, he had a succession of fits, and it required the strength of four men to hold him down. When he arrived at the infirmary, the surgeon decided that it would be advisable to detain him, as his condition was rather serious.

A PHOTOGRAPHER COMMITS SUICIDE.—An inquest was held at Powick, near Worcester, by the County Coroner, last week, on the body of Maximilian Ross, photographer, of 127, Princess-street, New Swindon. Mrs. Ross identified the body, which was found in the River Teme. She stated that her husband had been unsuccessful as a photographer at Swindon, and had sold his apparatus. He was well educated, and spoke several languages, and sought work at the Great Western Railway Works. He thought they would have given him a clerkship, but instead of that they put him to labourers' work, which he was unfitted for, and was afterwards discharged. Since January last he had tramped the country, and from time to time sent money for herself and the children. He was subject to fits of depression, and then gave way to drink. He had written to her recently to say that he had given up drink. Other evidence was given to show that deceased was seen to jump from the Old Bridge over the Teme. The jury returned a verdict of "Suicide by drowning whilst temporarily insane."

UNIVERSITY EXTENSION.—Lectures were delivered last week to the University Extension students at Cambridge, by Mr. A. W. Clayden and Proff Moore Smith. Mr. Clayden took for his subject the "Development of Photography." The old clumsy method in use before the introduction of dry plates was touched upon, and the early attempts to devise a more convenient process were traced by Mr. Clayden, who also explained the process of the manufacture of films for plates, and referred to the long search after sensitive compounds other than those containing silver. Some of the results of that search were enumerated and described as valuable. The use of gelatine as a medium was also explained, and then Mr. Clayden went on to describe the gelatino-bromide plate, the introduction of which, he observed, was of enormous importance. Their rapidity was now well known, and he thought they might be adapted to photograph all parts of the spectrum. The concluding portion of the lecture was devoted to illustrating the applications of photography to investigations, notably, in physics, meteorology, and astronomy.

Commercial Intelligence.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. J. Hartley, 21, Oxford-road, Waterloo, Liverpool, for his negative, *Feeding Chickens*.

THE EUROPEAN BLAIR COMPANY.—Mr. John Haddow, the Managing Director of the European Blair Camera Company, writes: "I have been informed that it is currently rumoured that the European Blair Camera Company, Limited, has been absorbed by Kodak, Limited. Will you allow me to give an unqualified denial to this statement?"

THE WARWICK COMPETITIONS.—The following is the list of awards of the Warwick Competition for August:—10^l. prize, W. Kilbey, 57, Pagoda-avenue, Richmond, *Quick as Lightning* and *A Champion Hurdler*; 5^l. prize, E. S. Baker, jun., 154, Bristol-street, Birmingham, *Bubbles*; 1^l. prizes, Miss Armstrong, 5, Clifton-terrace, Monkstown, Dublin, "Now I lay me;" Rev. E. T. Clark, Brunswick-road, Gloucester, *Kittens*; T. G. Clarke, 2, The Yews, Llandaff, *North Doorway, Llandaff Cathedral*; Michael Dillon, 23, Ernest-street, Crewe, *Saxon Crosses, Sandbach*; Miss Donaldson, 80, Wellesley-road, Croydon, *Matins*; P. Figuera, Thundersley, near Hadleigh, *View of Funchal, Madeira*; H. Foyn, Burleigh House, Penmaenmawr, *From Italy and The Carriage Drive*; A. S. Green, Inglecroft, Mansfield-road, Reading, *Radiogram of Man's Hand*; R. S. Harding, Knypersley, Congleton, *Summer Time*; A. E. Horne, Queenstown, Co. Cork, *Figure-head of H.M.S. Black Prince*; M. C. Howie, 49, Arbour-street, Southport, *Resting*; A. Hunter, jun., Photographer, Beith, Ayrshire, *Portrait Study*; T. E. Innes, Photographer, Wellington-road, Heaton Chapel, *Dogs Shaking Hands*; C. F. Inston, 25, South John-street, Liverpool, *A Friendly Gossip*; J. McCleery, 20, Beaufort, Stranmillis-road, Belfast, *Crossing the Line*; W. H. Rich, Browning-road, Little Ilford, Essex, *Child Padding*; J. Thomas, Holly Hall, near Dudley, *In the Hayfield*; W. Vick, Photographer, Muswell Hill, N., *My Little Greenhouse*; J. W. Wharton, Willesden-lane, Kilburn, N.W., *In Conference*; W. D. White, Leam-terrace East, Leamington, *Tea with Granny*.

Patent News.

THE following applications for Patents were made between August 7 and August 11, 1900:—

PRINTING MACHINE.—No. 14,223. "New or Improved Photographic Printing Machine." W. R. BARBER.

ANIMATED PHOTOGRAPHS.—No. 14,372. "Improvements in Apparatus for Projecting Animated Photographs." R. W. PAUL.

COLOUR PRINTING.—No. 14,427. "Improvements in or connected with the Reproduction of Coloured Pictures or Paintings by a Printing Process." Complete specification. E. TABOURET and C. GARNIER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
28.....	Hackney	Photographic Suggestions. W. Rawlings.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 16.—Mr. A. Haddon in the chair.

Mr. DRAGE inquired whether members present adhered to the time-honoured rule of dusting plates before placing them in the slides. He thought that, considering the elaborate precautions observed by manufacturers to avoid dust, it was altogether unnecessary, and the effect was more often to produce dust than to remove it.

Mr. TEAPE thought much depended on the way the plates were packed. When two plates were folded over with the film unbroken, dust was less sure than when paper was placed between them.

MR. HENDERSON had always been accustomed to dust his plates, but had recently omitted to do so, and had noticed no difference in results. Respecting packing of the plates, he was surprised that makers still adhered to the custom of separating them by slips of cardboard. A much more suitable material was tinfoil, which he had proved had no effect whatever on the film even after contact for a very lengthy time. On the other hand, the card was a frequent cause of fog. Mr. Henderson passed round some negatives produced on plates which were chemically fogged, and, by means of the cyanide restrainer mentioned by him at the previous meeting, had succeeded in obtaining excellent printing negatives. The comparison between the plate so treated and one which had been developed in the usual way was most striking.

Mr. TEAPE produced a box containing two half-plates, both of which some days previously he had seen Mr. Henderson expose to strong sunlight for two minutes. These two plates were removed by the Chairman from the box, and in full gaslight immersed in a developer by Mr. Henderson, who succeeded in obtaining two negatives, neither of which showed the slightest trace of fog. No particulars were given by Mr. Henderson as to his procedure, or as to what treatment the plates had received prior to exposure; but he promised at a later date to give full details of the method, his idea being, first of all, to hear what other photographers had to say about the matter.

The subject of rapid development was introduced by Mr. HENDERSON, and of which he gave a practical demonstration. A plate exposed behind a Warnerke sensitometer was developed to full density in a space of five seconds. The negative possessed excellent gradation and gave a reading of fifteen. The formula by means of which this result was obtained was as follows:—

No. 1.

Hydroquinone	20 grains.
Metal	20 "
Adurol	40 "
Sodium sulphite	480 "
Water	8 ounces.

No. 2.

Potassium bromide	10 grains.
Sodium hydrate	120 "
Water	8 ounces.

Equal parts to be used.

Mr. Henderson did not recommend the method for ordinary development, but thought it would be exceedingly useful where a large number of negatives of the same subject had to be produced for commercial purposes.

Mr. BULLEN introduced to members Mr. H. V. Lawes, an Australian photographer at present paying a visit to this country.

Mr. LAWES gave an interesting account of photographic society life in Australia, and, in concluding, mentioned that he hoped to be able to take back with him some slides and pictures by English workers in order that he might show some of the Australian societies what was being done in the old country at the present time. He appealed to those present to help him in this object, and stated that Messrs. Wellington & Ward had kindly offered to receive and pack all prints, slides, &c., sent them for this purpose.

PHOTOGRAPHIC CLUB.

AUGUST 15.—Mr. H. Snowden Ward in the chair.

MR. GEORGE E. BROWN showed a print on Pan paper, made by Liesegang, of Düsseldorf, and explained that this was a paper after the style of Gravura and Velox, which requires about twenty seconds' exposure by daylight. The paper is then developed, and it is possible to obtain black, green, olive, brown, red, or yellow tones by modifying the strength of the developer. A modification in the exposure to light will also have an influence on the resulting colour of the print, shorter exposures and stronger developers having both a tendency to give a range of darker tones, and vice versa.

Mr. FOXLEE, having examined the print shown, said it reminded him of the results obtained by the early chloride paper in 1886.

MR. SNOWDEN WARD asked what was the opinion of the meeting on the keeping qualities of isochromatic plates, adding that his own experience had been very good.

MR. MACKIE said that his experience had been somewhat varied. In one case he had found isochromatic plates which had been kept in slides for one whole winter, and then in a box for about two years, absolutely perfect, whilst in other cases plates which were kept for a much shorter time and under more favourable conditions were fogged.

Mr. FOXLEE had found plates—ordinary plates in this case—which had been made in 1886 quite good about eighteen months ago, and this despite the fact that they were packed with white blotting-paper between them, a method which is not now considered a good one. He believed that the secret of this success was that the plates as well as the packing paper and the boxes had been thoroughly dried before packing.

MR. MACKIE said he had tried the new form of kachin developer, but he found that, when using carbonate of potash as an alkali, the plates developed very slowly.

Mr. FOXLEE had tried the same developer, made up according to the formula recommended by the makers, and he had found it to work very satisfactorily.

North Middlesex Photographic Society.—August 13, Mr. W. Taylor in the chair.—Mr. COX showed a photograph of four figures; the felt hat of one appeared transparent, the collar part of shirt-front and face of the man behind showing through it. One member suggested that, if the man had bent down his head towards the end of the exposure, it might account for the phenomenon. Mr. RAWKINS showed an ozotype print on fine-surfaced collotype paper, which appeared to prevent the spreading of the image noticeable in some prints. It was quite sharp. Mr. BEADLE said that he had succeeded in getting rid of the gloss on carbon prints by immersing in methylated spirit after the alum bath. Mr. CHILD BAYLEY gave a formula for kachin with sodium carbonate. To make 1 ounce of developer, take 40 minims of a ten per cent. solution of kachin, and, instead of water, make up to 1 ounce with equal quantities of ten per cent. solutions of sodium carbonate and sodium sulphite; no bromide is necessary.

FORTHCOMING EXHIBITIONS.

1900.

- Sept. 21-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- November 7-10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
- „ 12-17 Ashton-under-Lyne.
- „ 21-23 Hackney Photographic Society.
- „ 22-24 Hove Camera Club. Hon. Secretary, C. Ber-rington-Stoner, 24, Holland-road, Hove.

1901.

- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

** We do not undertake responsibility for the opinions expressed by our correspondents.*

A CORRECTION.

To the Editors.

GENTLEMEN,—In your report of the proceedings of the L. and P.P.A., p. 527, a slight but important error has crept in, viz., the experiment in connexion with the removal of the stain in a negative should read cyanide of potassium, not ferricyanide.—I am, yours, &c.,
Westmoor, Brimsdown, Middlesex.

A. L. HENDERSON.

LICENCES FOR STILLS.

To the Editors.

GENTLEMEN,—I noticed in to-day's JOURNAL an answer to J. O'Connell about a licence for a still. No licence is required if you get—as I did—a permission from the Inland Revenue authorities to use it. I applied for permission to use a still for the purpose of distilling water for photographic purposes, and got a letter from the Supervisor in this district to tell me that the Board of Inland Revenue had given me the leave I asked for.—I am, yours, &c., J. E. GUBBINS, Lt.-Col.

Westward Ho! Bideford, August 17, 1900.

THE PURIFICATION OF ACETYLENE.

To the Editors.

GENTLEMEN,—I have had my attention called to an article on the purification of acetylene published in your issue of the 3rd inst. As this is likely to give a false impression, I shall be glad if you will allow me to make a few remarks. As a practical expert of nearly five years' standing, I question the statement that "no sooner does one process get published than it is written down by the upholders of another," and, being intimately acquainted with most of those in the trade of any standing, I think I have fair opportunities of knowing. Acetylene firms are only too glad to welcome any effective system of purification, which has from a very early stage been recognised as absolutely necessary; in fact, the number of materials used have been legion, beginning with those used in coal-gas purification and culminating with a very elaborate system of scrubbing. At the present time there are at least four useful and reliable materials or systems, three of which are generally known, but the fourth, though perhaps the most valuable, is not so familiar. The first is chloride of lime, either pure or mixed with some other material or chemical; but this has one great drawback, viz., the tendency to spontaneous combustion owing to the presence of free chlorine produced through the action of hydrogen; the need of frequent stirring to change the surface is another objection; but, with all its drawbacks, a considerable amount of success has attended its adoption, provided certain provisions are made to enable it to work under the proper conditions.

2. There is not a shadow of doubt that Dr. Frank's system does purify the gas, but one must candidly admit that the material cannot be renewed except by an expert or experienced mechanic.

3. Ullman's process is claimed in Germany to be the best yet introduced, and is, I believe, more generally used for large installations; but this, like Frank's, is not so easy to adopt for small plants. In fact, neither maker quotes for such.

4. The fourth material, puratylene, manufactured by the Gold and Silver Company, is also of German origin. It possesses the great advantage that no special case or holder is required, and, as it contains no free acid, an ordinary tin vessel is sufficient for the purpose; and, further, it is available for use even with the portable lantern generator. I do not say that some arrangement for condensation and arresting the fine solid particles is not an improvement, but it is not absolutely necessary. Some time ago I had this material submitted to me for test, and was more than pleased with the results, which I consider to be far in advance of anything hitherto accomplished in the matter of purification. I enclose the detailed report, which, after a careful test, I was able to submit to Mr. Bingham, the English agent, and trust the same may be of some service to your readers, especially those who use it for photography. Thanking you, and apologising for taking up so much of your space, I am, yours, &c.,

R. J. Moss.

*Birmingham, August 18, 1900.**[The report to which Mr. Moss refers is appended.—Eds.]*

[COPY.]

C. Bingham, Esq., London.

DEAR SIR,

Birmingham, June 14, 1900.

I have submitted the sample of puratylene to very careful tests under various conditions, and with the worst quality of carbide obtainable. I find that, in a trial extending over two months, aggregate of burners 35, pressure purposely varied from $2\frac{1}{2}$ to $5\frac{1}{2}$ inches, your claims are fully borne out. There has been no trace of haze, fumes, or smell, and not one of the burners has given trouble. Burners include the following :—

- 1 Schwartz No. 3, used for about 300 hours in a dark office.
- 1 Falk-Stadelmann, all steatite, No. 2, about 150 hours.
- 1 Schwartz No. 4, 100 hours.
- 1 Phos No. 2, 150 hours.
- 1 Phos No. 00, 40 hours.
- 1 Phos No. 4, about 100 hours.
- 1 Rat-tail, 4 litre burner, 50 hours.
- 2 Bray's 00000 Union, 40 hours.
- 4 Bray's 00000 Union, lantern work, about 30 hours.
- 20 Bray's 00000 and 0000, in studio, probably about 10 hours.
- 1 Phos No. 3, for retouching in studio, about 100 to 150 hours.

The last-mentioned has given somewhat striking evidence. The young lady had been obliged to give up an appointment because the fumes from acetylene (which they were obliged to use) caused her continuous and violent headache. She was, however, assured that nothing of this need be feared with the purifier, and consented to give it a trial, with the result that she now works regularly and for long periods without any trace of her former complaint. Without being too confident, I must say that so far it certainly overcomes the drawbacks and objections hitherto existing.

Yours faithfully,

R. J. Moss.

[Signed]

PAINTING BACKGROUNDS.

To the Editors.

GENTLEMEN,—I have seen in your JOURNAL lately some inquiries as to the mode of painting backgrounds, and have been induced to search for a receipt which I used successfully years ago for one. Here it is from the *Photographic News* of 1861, in the shape of a letter to the editor of the time. Perhaps it may be useful to some of your readers, or for your ALMANAC for the new year. I used it myself soon after seeing it, and can personally vouch for it, but you will find another letter in the same volume at a later date from another correspondent who had tried it with success. I will only add that the precise tint will, of course, depend on the proportion in which the colouring matters are used, and that an artist could easily vary them so as to produce landscapes, &c.

Letter from Thomas Gulliver to Editor of the *Photographic News*. Dated Heathfield Street, Swansea :—

"Your correspondent, W. H. H. may make a background that may be rolled on a roller easily, and unrolled without creasing, thus : Stretch a piece of calico sheeting, seven feet long, on a frame, or tack it to a wall, then size it over with thin glue size. When quite dry paint it with soap flattening made as follows :—Have some lamp black, white lead, and Venetian red ground up in as little oil as possible, mix this with turpentine till it is a dark mouse colour; then shave one ounce of common yellow soap in six ounces of boiling water, and stir till it is dissolved, then add it while boiling to one and a half pounds of the paint, mix it quickly, and when cold paint over the calico, and, if necessary, give it another coat when the first is dry. When dry, the background can be rolled or folded without creasing."—I am, yours, &c., J. F. T.

August 20, 1900.

Answers to Correspondents.

*** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:—

Oscillating Frame Owl Company, Limited, 17, Market-place, Great Grimsby.—Photograph of smoke cowl.

H. WYATT.—You appear to be in need of an elementary book on the lantern. That by Dr. Manton, published by Messrs. Iliffe, of 3, St. Bride-street, price 6d., should meet your case.

LENS.—D. CONWAY.—The diagram shows that the lens is one of the old orthographic or orthoscopic lenses. This form, though a good one for some purposes, has been obsolete for many years now. It has little or no commercial value, except perhaps for a museum.

PLUSH FRAMES AND BEVELLED GLASSES FOR OPALINES.—PROVINCIAL asks where these are to be had at professionals' prices.—All the requisites for opalines are to be had at any of the large dealers', such as Marion's, Houghton's, and the like. We cannot tell the price per dozen of the whole-plate size. Better write for price-lists.

ADDRESS WANTED.—J. B. writes: "Can you oblige me with the address of a firm who work for the trade who make *clichés* in relief for printing in phototype?"—In reply: We presume our correspondent means half-tone blocks. Let him address Messrs. Morgan & Kidd, Richmond, S.W., or other firms who advertise in our outer pages from time to time.

REMOVING SILVER STAINS FROM NEGATIVES.—W. G. writes: "Can you tell me of an efficient way of getting silver stains from negatives which have got wet during printing?"—These are not easily removable, and in some cases they cannot be removed at all. Try treating the negatives with a dilute solution of cyanide of potassium. If that fails, try King's solution, obtainable at Marion & Co.'s, Soho-square.

MATT VARNISH.—C. MARTIN complains that the matt varnish he has made according to the formula in the ALMANAC gives a very coarse grain, almost a reticulation. He wants to know how to make a matt varnish with a very fine grain like ground glass. The reason for the coarseness of the grain is that too large a proportion of benzole has been used. The less benzole the finer is the grain, and vice versa.

HUNT'S "RESEARCHES ON LIGHT."—A. REES asks where Hunt's *Researches on Light* is to be obtained, and the price. The work in question has been out of print for forty years or more. The only chance of getting a copy now is at some second-hand book-shop or by advertisement. The work is very scarce, though it may occasionally be picked up at a bookstall for a few shillings.

ROTARY PRINTING MACHINES.—H. C. writes: "Could you inform me where the machines are to be had, such as the Rotary Photographic Company use for turning out large numbers of small photographs for cigarette boxes, fancy goods, &c., as I have a customer who wishes to buy one?"—In reply: We believe the machines are patented articles, and cannot say if they are commercially obtainable. Possibly the Rotary Company, of 23, Moorfields, E.C., will inform our correspondent.

COPYRIGHT IN THE NATIONAL PICTURES.—LANTERNIST writes: "I want to make some lantern slides of some of the pictures in the National Gallery. Of course there is no copyright in them. And I assume I am at liberty to copy, for slides, any of the photographs of them that are published."—Oh, no. Although there may be no copyright in the pictures themselves, there is in the reproductions from them, and you must not pirate them. If you want copies, you must make them from the originals and not copy other people's work.

A. QUESTION OF COMPETENCY.—A. L. says: "Messrs. — made an engagement with me for the season, ending November 1, and they have, after I have been with them three weeks, given me a week's notice to leave, because they say my work is not good enough for them. I gave them a reference to Mr. —, and showed them specimens of my work. Can I come down upon them for my salary up to November 1?"—If your work has, during the three weeks, been equal to the specimens you showed, we should surmise you could; but, if your work, on the average, has not been equal to them, the matter is doubtful. Any how, it is a question for the County Court.

SPOTS ON PRINTS.—A. A. C. writes: "We will be much obliged if you can help us to explain the spots on the enclosed photograph. We may say our customer condemns the mounts, but we are inclined to think that there is some other cause, as the mounts are by one of the best makers, and we have not found enamel mounts to cause spots before, except for another complaint just being investigated."—So far as we can judge by merely looking at the print, we are inclined to the opinion that it was imperfectly fixed in the first instance. Read leading article in our issue for August 10. If the mounts are suspected, why not test them? It is a very simple matter, and the method of doing so has frequently been described in the JOURNAL and in the ALMANACs.

REVERSING-MIRROR TROUBLE.—W. C. CLARE asks: "Will you please tell me the cause of the unsharpness in the enclosed photographs? They were taken with a reversing mirror, for single-transfer carbon work. The mirror is a piece of thick plate glass, which I silvered according to the method given in the ALMANAC, and the surface is perfectly bright and free from blemishes."—The cause is that the surface is not optically plane. Ordinary plate glass is of no use for a reversing mirror. It must be "optically" worked, so as to obtain an absolutely plane surface.

RENDERING PRINTS TRANSPARENT.—TAPU writes: "1. Can you kindly inform me of the best method to render prints transparent. 2. Also to secure permanency after being coloured in oils?"—1. A great deal depends upon the process by which the prints are made. The best way to render albumen prints transparent is to soak them in castor oil or in melted paraffin. Bromide prints can be treated in the same way. Gelatine prints are more difficult to make transparent, on account of the baryta coating on the paper. 2. Thoroughly fix and wash the prints in the first instance, and no other treatment is required. Colouring in oils will aid to permanency rather than otherwise.

TONING SYSTEM.—PRINTER writes: "I came here as printer and toner at 30s. a week, P.O.P. being used. I have always been used to the combined bath, with which I can get very excellent tones; but the governor will not have that used, and will have the sulphocyanide bath; and, because I do not get good tones with that, he says I must leave in a week, though I was engaged for three months. Has he any right to dictate how the prints should be toned so long as they are good?"—Certainly he has. He, doubtless, considers the permanence of his pictures as well as their appearance. You should be able to get as good results by one system as with the other.

REMBRANDT EFFECTS.—REMBRANDT writes: "Could you kindly give me any information how to get Rembrandt effects in an ordinary studio without the use of blinds or reflectors? I have seen photographs of busts taken with strong light on the side of face and top of the head without the use of blinds, but I have always failed to get the top of head lighted. At what angle should I place the sitter?"—All must necessarily depend upon the studio. Most studios are fitted with blinds, and these are used according to requirements, whether "Rembrandt" or other effects are desired. It is possible that you may be able to place the sitter in such a position in the studio as to obtain "Rembrandt" portraits without using the blinds. But without seeing the studio we cannot, of course, tell you how.

PHOTOGRAPHY IN PARIS.—A. B. writes: "I should be greatly obliged if (1) you could favour me with the name of the best French photographic paper, and address of office—the one that holds the same position in the French photographic world as your JOURNAL does in the English. My object is to advertise for a berth in a Paris firm. 2. Would some kind reader of the JOURNAL who is acquainted with the photographic firms of Paris be so good as to communicate with A. B., 45, Broadway, Kettering, Northants, who would like to obtain a berth with a Paris firm, and would be very thankful for a few hints as regards the French photographers' methods of work?"—In reply: 1. The *Moniteur de Photographie*, published at 55, Quai des Grands Augustins, Paris. 2. Will some French reader oblige our correspondent?

STAMPING AN AGREEMENT; PARTNERSHIP.—ORION writes: "1. We have taken over a studio and accessories from the late owner for a certain price, payable quarterly. An agreement has been drawn up, fully signed by him in the presence of two witnesses. Is that agreement legal or binding without being stamped? 2. I wish to dissolve partnership. Kindly give me the necessary information to dissolve; or can I do so whether the other partner is willing or not; partnership has been a decided loss to both. The other partner has had his share of the takings and a great part of mine, and I have also lent him money. Can I claim the accessories here to repay same, although they won't reach one-half due?"—1. The agreement should certainly be stamped; all agreements of that kind should be. 2. The deed of partnership will contain the terms upon which the partnership can be dissolved; read that or consult a solicitor. That is the best procedure in the case of a dissolution of partnership if you cannot come to a mutual arrangement between yourselves.

THE METRIC SYSTEM.—COL. GUBBINS writes: "On page 1029 of the ALMANAC for this year there is a formula for adurol developer, but it is put in grammes and grains, and by no means can I contrive to get the two to be in the same proportion. Adurol as 8:1, 1½ ounces, is not not 8 times 85 grains. What is the value of 100 c.c. expressed in fluid ounces on pages 990 and 991 of the ALMANAC, &c.? The c.c. is given with reference to a cubic inch. Not having a measure graduated on the metric system, I cannot make up solutions from these formulae."—The formula is given both according to the metric and the English systems. By both systems the proportions are the same. There is no mention of adurol as eight to one. On page 548-9 of the ALMANAC there is a table of French weights and measures and their equivalents in English, from which you will see that 100 c.c. are equal to 3 ounces, 4 drachms, 9 minimis. Measures graduated according to both the metric and the English systems can be had of any of the dealers who supply chemical apparatus, such as Griffin & Sons. With these the same measure will serve for both systems.

** In consequence of our absence from town, many answers to correspondents and other communications are unavoidably held over.

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EX CATHEDRA.

THE Twentieth Annual Convention of the Photographers' Association of America, which was held last month, at Milwaukee, under the presidency of Mr. S. L. Stein, attracted the very large attendance of over eight hundred professionals, manufacturers, and dealers. A welcome by the Mayor; a Presidential address; papers; a competitive exhibition; excursions and entertainments, formed the chief items of the programme. The official report monopolises nearly the whole of the August numbers of several of our American contemporaries. Twenty-seven medals and diplomas were distributed amongst professional competitors in portrait and other classes, and there was a well-supported exhibition of apparatus and materials, no less than sixty-five firms contributing to it. A selection from the competitive portraiture is reproduced in the *Professional Photographer*. We should say that the work shown at Milwaukee falls behind that sent to preceding American Conventions. Professor A. H. Griffith, as usual, delivered several addresses, and we reproduce one of them in another

part of the JOURNAL. British, as well as American, photography may profit by the well-meant advice to make a special study of every sitter.

* * *

THE Thornton Film Company, Limited, of Altrincham, Cheshire, send us a prospectus and price-list of "Dayroll," the new negative film, which is to be supplied in the cut form for slides, and in the spool form for roll-holders and daylight loading cameras. From the prospectus we abridge the following statement of the special characteristics of the new film: "It is flexible, tough, unbreakable, and uninflammable; it does not curl up in developing, washing, or drying, and can be retouched on either side, or varnished if desired. It can be printed from either side, thus saving the trouble of double transfer or reversing. It will keep just as long as any sensitive glass dry plate. It is as easy to use as a glass plate, and several negatives can be developed together in the same dish. Smaller sizes may be cut from large sheets with a knife or pair of scissors. The film consists of a film of pure gelatine rendered insoluble and coated with a very rapid emulsion, the whole being supported upon a backing of transparent paper. It is developed, fixed, &c., exactly like a dry plate, and, as the paper support and film is transparent, it is just as easy to judge the density of the negative, and also whether it is properly fixed, in the light of the dark room, as with a glass plate. After washing and passing through the usual glycerine bath, the film is merely hung up to dry (like a print). When it is absolutely dry, the transparent paper backing can be easily removed by merely pulling it away, leaving a perfectly flat, flexible, and transparent negative. There is no frilling in the solutions; no trouble in stripping; the film will not come off the transparent paper during any of the operations until purposely pulled off, and then it never fails to come off easily when required." Of course, time and experience must decide whether these claims are well founded. Should they prove to be so, the Thornton Film Company will have made a valuable addition to the resources of film photography.

* * *

THIS week the Jubilee of the submarine electric cable between England and France has been celebrated, and our

contemporary, the *Daily Telegraph*, printed an interesting article on the subject. The writer tells us that the little forerunner of the present system of nearly 200,000 miles of wire began modestly enough. A project was formed to lay a line about twenty-four miles long, from Dover to Cape Grisnez. The distance is somewhat less, but a margin had to be allowed for various contingencies. In 1846 Mr. Jacob Brett obtained from King Louis-Philippe the sole right for landing cables from England in France, but the political troubles which followed, culminating in the flight of that monarch, interrupted the scheme. Still, it was regarded with a friendly eye both by Lamartine's Government and by Louis Napoleon, who stipulated that "the experiment should be satisfactorily proved" by September 1, 1850. On the final confirmation of the concession, a little syndicate was formed, with a capital of only 2000*l.*, the names of the adventurers, using the word in its honourable sense, being Mr. Charlton J. Wollaston (the engineer of the undertaking), Mr. (afterwards Sir) Charles Fox, Mr. Francis Edwards, and Mr. John W. Brett. Three of the four were under thirty years of age. Three of the four are now, alas! with the majority, but the survivor, Mr. Wollaston, who is verging on his eightieth year, looks out, hale and vigorous, from his little suburban villa on a huge and ever-growing institution which must transcend the wildest dreams of his pioneering days. Tall and erect, he has in his whole aspect something of that intellectual keenness which characterised the late Mr. Gladstone, and his bearing has the same suggestion of exceptional vital energy. Such is the man who tells the story of the first submarine cable. To photographers, interest in the personality of Mr. Wollaston will lie in the fact that he is not only one of themselves, but is also, we believe, the inventor of the diaphragmatic shutter, bearing his name, that was brought out some fourteen or fifteen years ago.

* * *

FROM the editorial notices of our contemporary, *Wilson's Photographic Magazine*, we cull the following paragraph: "The G. Cramer Dry Plate Company, of St. Louis, announces that hereafter all Cramer plates will be protected with a label on the bottom of each box, giving the time within which the plates must be used if the best results are desired. Their intention in this desirable innovation is to protect users of Cramer plates against old or stale goods, and consumers are warned not to accept *Crown* or *Banner* brands prior to emulsion No. 13,180, or *Isochromatic* prior to emulsion No. 3916." Our *confrère* says that he is "emphatically of opinion that this is a step in the right direction." We are left in the dark as to the time limit adopted by Messrs. Cramer, and we should also like to know their reasons for taking a step in which we doubt if they will be followed by any English plate-makers. The articles and letters that we published some months ago on the subject of the keeping qualities of dry plates pointed to the conclusion that it is a difficult thing to set a time limit beyond which plates other than those of extreme rapidity do not deteriorate. Twelve, fourteen, and even sixteen years have been proved to make no material difference to the good negative-giving qualities of English-prepared plates. At one time within our recollection plate-users often asked for the specification of a time limit on the packing boxes of plates, but nowadays we hear nothing of such requests. Messrs. Cramer are plate-makers of large and long experience, so that their reasons for the adoption of a time limit can hardly rest on insubstantial grounds. We are curious to know them.

THE same number of *Wilson* also contains the following advertisement:—"Bureau of Art Criticism. Photographers desiring art criticism upon their work—constructive criticism, covering the artistic qualities of the photograph, composition, lines, arrangement, and light and shade—by an art teacher familiar with painting, photography, and other methods of artistic expression, can obtain same at a nominal cost. Especially valuable to those striving after pictorial effects and those preparing work for exhibitions. The work is suggested and indorsed by the editor of this magazine as a practical help for all progressive photographers. Terms, invariably in advance—25 cents for criticism of single prints. Six criticisms for \$1.00. All prints returned within twelve days after receipt. Send prints, charge prepaid, with sufficient, in addition to fee, to cover return charges, to A. Guvera Marshall, 388, Dean-street, Brooklyn, N.Y." A shilling per criticism, or half a dozen for four times that amount is not dear—provided that the critic is properly qualified for his somewhat delicate office. If we mistake not, we have come across Mr. Marshall's name appended to articles on art topics that have appeared from time to time in the American photographic journals, and the phraseology of his advertisement seems to indicate that he understands his subject. Without going so far as to say that it would meet a long-felt want, we have no doubt that a bureau of art criticism for the benefit of English photographers would be an interesting experiment to try, although, having regard to the many and conflicting ideas that exist on the subject of pictorial photography, it would not be easy to fix on a critic whose dicta would be assured of acceptance all round. Still, here is the idea, and we commend it to those most concerned.

THE OZOTYPE PROCESS.

It is now nearly two years since the earliest examples of the Ozotype process of Mr. Thomas Manly were first publicly shown. When they were, there was considerable speculation in the photographic world as to how they were produced. The only particulars given at the time were that they were "examples of carbon printing without actinometer, transfer, or safe-edge, and in which the pigmented gelatine did not come in contact with the chromic salt." At that time there was but one process of carbon printing that answered this description, and that was not generally known amongst any but the oldest photographers, and even by many of them it had become quite-forgotten. We allude to the process of M. Marion, which he named "Mariotype by contact." That process is this:

Instead of sensitising the carbon tissue, M. Marion took slightly gelatinised paper, and sensitised it by floating it on a solution of bichromate of potash to which a little sulphuric acid had been added. It was then allowed to dry and was ready for printing. While printing, the picture could be watched as with silver printing, the image being brown on a yellow ground. When sufficiently printed, a piece of ordinary carbon-tissue was immersed in a dilute solution of bichromate of potash with the already printed picture; they were then removed in contact and squeegeed together. In this state they were put away, under slight pressure, for some hours in a still moist condition, when the insolubilising effect set up by the action of light was continued in the unexposed tissue. After the lapse of the necessary time the image was developed on the paper that had received the exposure in the manner of ordinary carbon printing. M. Marion's paper, which he read-

fore the Photographic Society, now the Royal, will be found a p. 242 of our volume of 1873. Now, it will be seen that Iariotype does not entail the use of an actinometer; there is a transfer, there is no safe-edge required, and the picture is not reversed. Therefore it is not surprising, when the Ozotype samples were first shown, that it was surmised they might be modifications of the Mariotype process. The actual manipulation of the two processes is almost identical. It is in their chemical aspects that they differ.

In the Ozotype process the gelatined paper is sensitised with a solution of bichromate of potash containing a manganese salt. In a paper that Mr. Manly read before the Royal Photographic Society he thus explains what takes place. He said that the paper is coated with a solution of a bichromate salt and a manganese salt, and by the action of light the eliminated oxygen entered and decomposed the molecules of the manganese salt, producing an image in the sesquioxide or manganic oxide, the active oxygen being thus locked up for future use (see p. 222 of our volume of last year). The necessary materials for working the process have recently been put upon the market, so that every one now has the opportunity of trying it.

The Ozotype Company have been good enough to send us a bottle of the patent sensitising solution, some of the "pigmented plaster," also some paper ready-sensitised for trial, together with a little booklet of instructions for using them. In this we read that it has been decided not to sell the coated paper for the present, but full directions are given for its preparation. They are these: Any good paper, according to taste, is coated with a two-and-a-half per cent. solution of gelatine by brushing, and allowed to dry. It is then coated with the patent sensitising solution, also by brushing, and again allowed to dry. It is then ready for printing. The paper when sensitised, we are told, will keep for three or four months. We used the sensitive paper we received in our trials, as we have as yet had no time to prepare any for ourselves. The paper is of the usual colour of bichromated papers, and takes the usual brown colour when printing. On trial we fancy it was rather slower in printing than ordinary carbon tissue; but it must be printed deep enough for the details to be fully seen in the high lights. The print is then washed, to remove all soluble bichromate, and dried. In this state it is said to keep indefinitely. The next operation is to apply the pigment plaster. This is done by immersing it in a dilute solution of acetic acid, hydroquinone, sulphate of iron, in water, at a temperature of 70° F. for a minute or so, and then introducing the dried print, and afterwards squeezing the two together and allowing them to dry.

In our issue for April 21, last year, in commenting on the want of sharpness some experimentalists with the process had found when using the ordinary carbon tissue, we suggested that probably a more highly pigmented tissue than that would be found more suitable for Ozotype. We notice that the plaster sent us is considerably more highly pigmented than the usual carbon tissue, also that the gelatine is of a more soluble character.

The temperature of the acetic solution seems to be of importance, for in our first trials that we employed was not above 60°, and, as the prints, as we afterwards found, were under-exposed, very much of the image washed away in the lighter portions. In our later experiments, with fuller exposure and the temperature of the solution at seventy

degrees, they did not. When the picture is to be developed, it is first soaked in cold water for half an hour or so, and then put into water at a temperature of 105° to 107° F. In a minute or so the plaster can be stripped off, and the superfluous pigment washed away by laving the water over it as in ordinary carbon printing. We noticed, while working, that the image was of a more tender nature, and would not bear the same rough usage as carbon pictures will in their development. In our hands the prints developed in less time than fully exposed carbon prints would have done. When developed, the prints should be alumed like carbon pictures. Using the materials we did, we got, after the first essay, some very good results. It will be seen that the operations involved are about the same as those in carbon printing by the double-transfer method, and more than those in the single-transfer method. With the latter, however, unless we have a reversed negative, or prints from a thin-film one, we get, as regards right and left, a reversed picture, while with the Ozotype process we do not. One of the advantages of the Ozotype process is that, in printing, the image is a visible one, whereas in the ordinary carbon process, unless we use an actinometer of some sort, we have no more to guide us as to the right exposure than we have in the exposure of our dry plates or bromide papers.

If we might throw out a suggestion to the Ozotype Company, it would be that they should, as the papers keep so well, supply some papers ready-sensitised. If this were done, we imagine it would aid in popularising the process. Amateurs, as a rule, like to obtain their pictures with as little trouble as possible, and the gelatinising and sensitising are two distinct operations, and these may tend to deter some from trying the process on account of the trouble involved. Moreover, in preparing the paper on a commercial scale, with suitable appliances, it can be done more uniformly than a novice could possibly do it on a small scale by applying the materials with a brush.

Hardening and Preservation of Wood.—The Hasselmann method of preserving wood now being introduced by the Xylonite Company has a double interest to photographers in that wood treated by it becomes far less inflammable, and nonliable to alter under the effect of moisture, and, further, is not liable to shrink or warp. Painful experience has taught most of us that cameras made of the very best seasoned wood will become stiff and the dark slides unusable if they are kept any length of time in a damp atmosphere, while many a cracked or broken negative is traceable to warping of the wood through this or other causes. Hence a mode of treatment which for carpenters' work would render wood practically uninflammable in case of fire, and make our cameras, dark slides, printing frames, &c., indifferent to summer sun or winter humidity, would be valuable indeed. Yet this is virtually what is promised us under this process, though the chief stress of the claims made for it is in the direction of woods for what may be termed rougher work. Thus the Bavarian Government are using it largely for their railways, for their sleepers and telegraph poles; up to the year 1905 these are all to be treated by the Hasselmann process, and the Swedish State authorities have already ordered more than half a million sleepers to be Hasselmannised. Obviously, if these larger pieces of wood can be preserved, smaller ones would be equally amenable to similar treatment. This is simple enough in action. The first thing is to dry the wood; this is done by extracting the moisture by a huge air pump, and perfectly green wood may be used at this stage. The pores are then freed from sap and left in what might be termed a spongy state. They are then kept in their air-tight receptacle, and a solution of mineral and metallic salts let into it. The liquid is rapidly taken up by virtue of the same action, which in the old experiment filled

up with mercury the pores of a piece of cane tied down under mercury and placed in the exhausted receiver of an air pump. The action is further accelerated and intensified by steam pressure at a temperature of about 130° . The dissolved salts are sulphate of copper and iron, with aluminium, magnesium, and potassium. Besides conferring the properties already mentioned, it is stated that soft woods under the process become quite hard and capable of receiving a high polish, so that altogether wood so changed would seem to have promise of a very brilliant future before it if no concurrent drawbacks be found to exist. It would seem to be a reasonable expectation that a studio whose wood fittings were of wood impregnated this way should appeal to the fire-insurance authorities, as the ready inflammability of studios is one cause of the high premiums insisted upon by them, even though the danger of fire through collodion accidents is now virtually eliminated, though we have been credibly informed that it is the black sheep of the profession who are the cause of the heavy insurance rates as compared with other risks. The British Fire Prevention Committee during their eighteen months' existence have tackled this subject in a very exhaustive manner, and it may be hoped that their labours may possibly lead to the lightening of the photographers' heavy burden of increased premiums. We learn from an announcement made by their Chairman that they have made a large number of fire tests—twelve with fire-resisting doors and nine with similar partitions, twenty-three with different forms of wood and iron doors, and eight with various forms of glazing, and, finally, several with treated wood.

The Nipher "Zero Plate" Process.—Further particulars of this process, which has of late been attracting considerable attraction, have been given in *Nature* by its inventor, Professor Nipher, of Washington University, St. Louis, Missouri. "The plate is placed under a punched stencil in a printing frame. It is exposed at 7 cm. from a 16 candle-power lamp. By a few trials one can find the time interval of exposure so conditioned that nothing will develop on the plate in a developer of fixed composition, strength, and temperature, and at a fixed distance from the 16 candle-power lamp. This is a standard developer. With a shorter time of exposure than that giving the zero plate, a negative will result; with a longer trial, a positive. A plate to be used in taking any picture to be developed in the standard developer (as a positive) is all exposed to the 16 candle-power light at a distance of 7 cm. for a time, which experiment has shown will put the film into the zero condition when developed in the standard bath. It is then put into the plate-holder, and given a camera exposure in the usual way, after which it is developed. It is not important that the developer should be at any particular distance from the lamp. The plate is pre-exposed so that a zero plate will result in that particular bath at any fixed distance from the lamp. I usually make this distance about eight inches." The use of zero plates was described in the JOURNAL of August 17, p. 516.

The Dark Flash.—To the same number of *Nature* Mr. J. B. Hannay, of Cave Castle, Dumbartonshire, contributes a short letter, in which he gives what to him is a clear illustration of the reason why some of the lightning discharges in a photographed thunderstorm appear dark. At Wednesfield, Staffordshire, about mid-day on Thursday, July 19, there was a number of double flashes, that is, two discharges occurring rapidly in the same apparent region, but following different courses, and separated in time by from one-eighth to one-half of a second. But one flash, says Mr. Hannay, quite near to where I stood (one second and a half between flash and sound), gave a repetition following absolutely the same path as the first flash, and practically as bright. The only difference was that two faint branches of the first flash were not repeated in the second discharge. The second flash followed so quickly (about an eighth of a second, I estimate), that the impression on the retina of the first discharge had not died out when the second exactly covered it, so that I could appreciate the absolute coincidence. Mr. Hannay suggests that a few cinematographic records of thunderstorms would show whether or not such repetitions are common, and whether they are the cause of dark flashes on the photographic plate.

Salaries of Photo-mechanical Workers in Germany.—We often are told that labour in Germany is so much cheaper, and that the hours worked are longer, than they are in this country, and therefore England cannot compete with Germany in price, &c. In our issue of a fortnight back we gave, on the authority of the *Photographische Chronik*, a tabulated list of particulars of wages paid and the hours worked in photo-mechanical establishments in Berlin, Leipzig, Munich, Stuttgart, Nuremberg, and Dresden. Of course these, assuming they are correct, are averages, and must not be read to imply that all or nearly all workers receive the same wages in the same town. Some receive more and some less than others; it is the average only, and that includes the wages of apprentices, that is given. We happen to know that in some establishments in Germany the highest skilled labour is paid at a higher rate than it is here. We also know that second or third-rate skill is paid far less than it is in this country. From the tables given it will be seen that the highest average wages are paid in Munich. As to the hours' work, about which so much has from time to time been said in England, it seems that the average hours worked in German photo-mechanical houses are not longer than they are here. The greatest number of hours worked, it seems, is in Leipzig, where they average fifty-three per week, whilst in Munich they are but forty-eight and a half. We cannot help thinking that the average low wages paid and the long hours worked will not entirely account for so much of the highest-class reproduction work—photogravure, for instance—leaving this country to be "made in Germany." We are afraid we must seek some other reason.

War Portrait Buttons and Brooches.—Some weeks back we commented upon the number of war portraits of the above type that were to be seen in a very wo-begone appearance, and asked what other could well be expected at the price at which these portraits must have been produced to sell retail at the figure they were sold. To give an idea of what the price was, we quote from the report of a case that came before the City of London Court one day last week. The plaintiffs, a Bohemian firm, sued the defendant for 49*l.* for 250 gross of these buttons. The defence was that the buttons were not delivered in the time specified, viz., fourteen days. It was suggested by the plaintiffs that no promise as to time was given, and that the defendant had obtained other war buttons at a *cheaper rate* from America. In the end the Court gave judgment for 30*l.* instead of the 49*l.* originally claimed. Now, it will be seen, at the original contract price, 250 gross for 49*l.* is less than four-pence per dozen, including a brooch with a pin. This does not allow much for the production of the photographs, or for much care to be bestowed upon the fixing and washing, and who can be surprised that in a short time they show signs of decay? If the American productions were sold in this country at a less rate than the above, it would be interesting to know at what price the photographs themselves were produced, and the profit they carried, for there is no question they carried some, or they would not be made at all.

Should Plates be Dusted?—At a recent meeting of the London and Provincial Photographic Association a question was asked as to whether the members still dusted their plates before putting them in the slides. The speaker said, considering the great precautions taken by the makers, it was unnecessary, and the effect was more often to produce dust than to remove it. That might certainly be the case unless the dusting were carefully done and a perfectly clean brush used. In packing the plates the makers take every care to avoid imprisoning dust, but that is not always to be avoided when opening the parcels. Fibres of the packing papers and cards are liable to become detached and settle on the plates, so also are particles of dust—often of a pernicious character—always present in the room, and unless these are removed they will often make themselves unpleasantly manifest when the plate is developed. There is no question that, in some instances, more harm than good may be done, but then the work is done carelessly. Too many amateurs are not careful to see that their dusting brush is clean and free from dust before they use it, and, when this is the case, the plates had better be left as they were.

NOTE ON A GRAPHICAL METHOD OF SOLVING
CERTAIN OPTICAL PROBLEMS.

[Paper read before the Royal Dublin Society, February 16, 1887.]

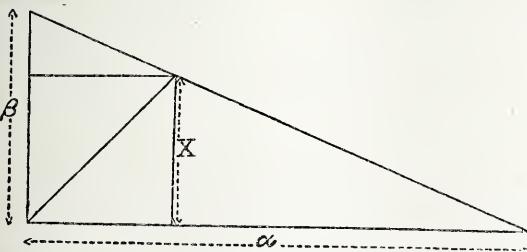
In the calculation of curves of optical lenses it is frequently required to add and subtract reciprocals; and formulae of the form

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{x}$$

are of constant recurrence.

In the study, where a logarithm book is available, the arithmetic of this is generally very simple; but in the workshop or laboratory graphical method of solving the problem is often more convenient, particularly in the hands of workmen who had not had a mathematical training.

In the working out of some optical diagrams on logarithmic paper I accidentally arrived at the following graphical solution, which I have found very useful, and on the principle of which I am constructing calculating machine suitable for solving these particular problems:—



Draw a horizontal line—the α of above formula, and erect at one extremity a vertical— β . Join the extremities of these two lines. Bisect the right angle, and produce the bisecting line till it reaches the line joining the extremities of the lines α and β . From the point of intersection drop a perpendicular on the line α , and the length of this perpendicular on the same scale will be equal to x in above formula, or $= \frac{\alpha\beta}{\alpha+\beta}$.

According to this principle, a machine can be constructed in which the various quantities can be read off by scales, without any calculation whatever.

SIR HOWARD GRUBB, F.R.S.

[It is of interest to compare the foregoing paper with one on the same subject recently read by the Rev. F. C. Lambert, M.A., at the Royal Photographic Society and reprinted in the JOURNAL of August 17. Sir Howard Grubb's paper was published thirteen years ago, and we believe that he has used this graphic method on and off ever since.—EDS.]

STUDY YOUR SITTERS.

[Abstract of an address delivered to the Twentieth Annual Convention of the Photographers' Association of America at Milwaukee.]

We live and learn, and it is the progress of a nation and of an individual that makes life worth striving for. I find men who gather up pictures and come to conventions feeling that they are going to sweep the whole thing before them; and after they come here and take a look at your exhibition they wish their pictures were at home. Now, in the past I have tried in a way, crude and abrupt sometimes it was, and in such a manner that you rather opposed it—I tried to bump you, as it were, out of the ruts; and once in a while I have pushed you clear over to the other side of the road, and you have been just as bad there as you were in the former place. Now you are drifting back to the middle ground, to the safe, sure ground. The difficulty is that you are not true to yourselves; you do not think out a policy, you do not think out a plan, you do not work up to a certain idea which is independent, which is true to yourselves. But you read now more than you used to; and I thank God for it; an ignorant photographer has no business in business. You look more than you used to; you use your eyes and look at other men's work; you look at paintings; you look at pictures; you look at people; you study their faces, you study their pose, their walk, their character, and all their characteristics; and all that is valuable to you, it enters into your work. Once, as I have often said, you would let men and women come into your studio, your "operating room"—and I wish you would not use that word "operating;" it is an unsuitable word for a photographer

to use; why, they operate on you when they take you to a hospital to cut off your leg; do you want people to have that sort of feeling when they are going to your office as an amputating, as an "operating" room? Why, that idea at once puts a wrong impression into a man's mind, and stamps its reflex upon his face; call it your studio, call it a work-room, call it anything under heaven but an "operating" room. The first thing when a patron comes into your studio, into your reception-room, is to make him or her feel at home, make them feel in good humour; you must have the patron in a good humour to get the best there is in them into the picture, whether they be man, woman, or child. Let them constantly feel that they are among friends, and with friends; every day you see pictures of people that tell you nothing as to whether those people have a heart or soul, they are without expression; you don't know whether here is the picture of a man who is a banker, or a pawnbroker, whether he has the slightest iota of human sympathy in his makeup. You must reflect character in your pictures, and you must draw the true character forth from the patron if you want it in the picture. Now, if when the man first comes into your waiting-room you approach him first on a matter of money. Oh, dear! we all have to live for money, we have to work for money, we have to make our living; some people think it is a grab game, and, if you don't grab your share, you will not get any. The man comes into your room; we will say he expects to pay five dollars for a dozen photographs, and you instantly commence on the financial side of your business, and you tell him the price is eight dollars. At once there is a shade of disappointment in his face, and it never leaves that face till he gets out of your gallery; and it is in that photograph.

Now and then I get to look at a lot of photographs, and I give the makers of them a talk; and, in the place of talking all technique, I give them a talk on phrenology, on faceology, if you wish to call it such, because there is nothing else to talk about. I find now and then a collection of pictures in which there are no great things; they are all ordinary; and I can only talk faces then; and I do it because I feel that I ought to impress you with this idea that there is in every man and woman something of the divine, if you can only bring it out. You must reach them from the side of their human feeling; talk to the farmer of his crops; talk to the Nebraskan of his corn: talk to the Southerner of his cotton; talk to the man from Chicago of pork. If you can talk to any man about that in which he is interested, you will immediately see his face light up, and then is your time to take him at his best. I want the soul of the people whom I love to come out in their pictures. You are getting past the age of purely mechanical achievement; the photographer is stepping outside and beyond the mechanical; you are becoming artists, because you are reading, and looking, and because you are no longer copying. Be yourselves; see what other men and women are doing, but then do something yourself; that is what will make an artist of you, photographers. The day is gone by when you can retouch and iron out all a man's character; you now leave a little of it in; and you will gradually only touch out the imperfections and leave all of the soul of the man there, so that, when another takes up that photograph, he will at once know whether the subject of it was a banker, or a manufacturer, or whether he was a grocery-keeper, or a pawnbroker; whether he sells over the counter, or takes in money, or whether he is a philanthropist, or an artist; he will know it instantly. I don't say that every one cannot read faces; why, the merchant with whom you deal makes up his mind instantly whether he will trust you or not, from your face; he is always reading faces unconsciously; and so with people who come into your gallery, you know intuitively whether you want to take their pictures or not. One man loves children; there is at once a bond of sympathy between all children and that man, so that he gets out of them the very best that is in them; and so he makes marvellous children's pictures. Another man makes pictures of young ladies of fashion, of women who dress because they are pleased with it, and wish to please their friends, women who pose before the world as the leaders in social life; and the photographers who best succeed with them are those who can best draw them out from that side; and again we find the photographer who makes old men's heads, and makes them marvellously well, wonderful works, so that you see the character that their sixty, seventy, or eighty years of life that has gone past has written on the faces of those men or women. You may think that you make your face, and you do; God makes our bodies, but it is what you live that comes out in the face, in the character, in the walk. I said of Bryan, whom I saw at Lincoln, when he walked out of that hall, that he was a stubborn man—I am not talking politics, I am talking about men—because he put down those big feet flat; that is all I wanted to know of him. You people who think, and are honest in your Democracy

that you can lead that man, will find out he will lead you. He is built like the Irishman's fighting cock, with his two fates on the ground, and all the devils can't trick him. That stubbornness may be a good and may be a bad characteristic. Every man's character is brought right out in his make-up. It is the studying of this character indication, together with thorough familiarity with all the laws of manipulation of the materials with which you have to deal mechanically, which will make successful photographers. A few years ago everybody was making Madonnas; there wasn't a single exhibition at which there were not a lot of Madonnas, that Mother of the Christ; and what a host of sacrilegious women they were, beautiful, but without soul; and I damned you for it; I told you to leave Madonnas alone, that there was only one woman in a million who could pose for a Madonna, and you could not live with her. A Madonna would be a woman who was so far above you and all the world, secure in her own place both here and in heaven, because she was the mother of the King of the world, that no power, surely no human power, could live in the same house with her; and you stopped making Madonnas then, and you began making old men's heads and old women's heads; and every old man and old woman in the whole country was drawn out and filled up your exhibition. And I am glad of it, because it gave another phase of character: but now, as I take a glance at your exhibition I find young men, and young women, children, middle-aged and old people; and I find that you are on territory that you can handle, on territory that you understand, on territory that you know. Yesterday your President said, "Don't follow fads;" be honest to yourself is what I mean. Some man makes a misty dreamy picture, like George Inniss, of an evening landscape, and puts into it all the poetry of the dying day, all the mystery of that hour between daylight and darkness, when everything is indistinct and gloomy and full of haze; George Inniss could do that. But because you people go out and take a smudgy, fussy, cottony-looking picture, don't think that you have made an Inniss; you have not done it; you cannot put the soul into it; and it is the soul that makes the picture. Now, I don't care whether a painter uses his brush, or his fingers, or a pallet knife; what I want is the result; and I don't care if you make your pictures sharp, so long as you don't cut the picture out of the background, or I don't care if you give it to me as soft as nature meant to make it under certain conditions, only give me a picture of the friend whose friendship I prize, of the woman whose love I would die for, of the father I honour and respect, of the mother whom I love. Don't take out a single wrinkle that you can leave there; every wrinkle is hallowed by the sixty or seventy years of trial and tribulation in fighting the battle of life, and they are all honourable scars; every one is a crown of glory to that old head and that old face; don't take them out. Make youth as symmetrical, as beautifully round as you may, make it full of happy ambitions, of love and affection, as full of the joyousness of young life, the gladness of living; make childhood with no care, with nothing but indifference to all about them of pain or evil, in unconscious abandon of innocence; but let old age show evidence of having fought the good fight and kept the faith, reaching out with confidence to the life to come. Put into it all the serenity of a nature at peace with itself.

But now every once and a while I am told, "That's all very well to talk of, that's theory, but here comes a man that wants his picture taken, and we want their money, and we have to take them." I have said to you again and again, never let \$2 get out of your place if you can keep it in; rent comes due promptly, the stock dealer comes around for his money; never allow a dollar to get out of your place that you can keep in it; but, if you set your price at \$1, you will be a dollar man. Raise your standard high and bring your patrons up to it, and all your people; make your pictures tell their story, and then there will be no trouble about price. People in this country are waking up to the fact that we are leaving the days of rag carpets and bare walls; they want the best, and they are willing to pay for it; and they only know the best as you make the standard for them; if you make cheap pictures in your territory, the people will know nothing but cheap pictures, and they will only pay a cheap price. You can make a class of good pictures, and, even if they don't always meet your highest ideal towards which you are striving always, you can demand a price within reason, and get it, and that is far better. Await your opportunity to make great pictures; make good pictures all the time; and now and then, when some face comes into your gallery that you find is ample for use in any direction that you want, that you can mould like sand, that is your opportunity. Actors walk the boards for \$10 or \$12 a week for years, doing good work, excellent work, awaiting their opportunity when the star may be sick, or incapacitated from any cause, and then step into his shoes, into his reputation, and then they are no longer cheap men. Just so await your

opportunity; it comes to every man. There is a tide in the affairs of men, which, taken at the flood, leads on to fortune; grasped at the right moment it will mean success, and success means money and fame. Press and magazine writers have toiled with their pens for years, using their best energies in the struggle, until suddenly they sprang into prominence and position. Why? Because they seized the opportunity as it presented itself.

A young man writing for one of the London papers at \$8 a week was sent to France to report a reception given by the Emperor and Empress of France to Queen Victoria and Prince Albert. He was an unknown man, simply paid a salary of \$8 a week and his expenses; he crossed the Channel, secured a ticket into that great reception and banquet given for the sovereigns of England, and then he kept his eyes open; and he watched the table, every movement, every pose; he noticed that, when Prince Albert and Queen Victoria sat down to table, they sat down like monarchs, knowing that there was a chair placed behind them by the servant. When the Emperor Napoleon III. sat down, and the Empress Eugénie, both looked back to see if there was a seat for them, showing that they had come out of the people, a trait of character, and he wrote it up! and then came a cheque to him and a letter saying that his salary was increased to \$25 a week, and a position assured him for ten years if he wanted it, simply because he caught something of the people's character; because he was observant, and could see things well and tell about them. Now, there is an opportunity for all of you people; grasp the thoughts and ideas that are presented to you; take hold of the idea instantly as it suggests itself; it will never come to you unless you are ready to see it as it comes within range. Visit every picture gallery, study every painting that comes within your vision; there is no doubt but that at any moment some one will come in that will afford the opportunity for you to make your fortune and your reputation, but you must be ready. Your President spoke of many good points; he gave you many good ideas on the business side, as well as the art side. He speaks of the people whom you would meet; he spoke of how to handle those people. I think most of you neglect the financial side, most of you fail to see where the dollars and cents come in; most of you fail on the score of feeling that that is good enough; there never was anything good enough. Millet, when he painted his picture which set the world on fire, those potato-gatherers waiting in the growing twilight for the bells of the angelus to ring across the fields, said: "Oh, if I might only have that picture again to paint it over!" And yet it sold for \$115,000, and you could carry it under your arm. Now, you must never be satisfied with what you have done. Satisfy your people always; do everything that is possible to please and take care of your picture and your customers; but within yourself set your ideal so high above all that you have already done, that you, in striving to reach it, are bound to win the praise of others, and to deserve it. Study your people, if possible, when they come in; don't take them out and seat them at once for a picture. I remember of that remark by an artist of the old-time methods when he said that when he went to have a photograph taken it gave him the "shivers," because they always seated him on a chair, and clamped two cold, clammy things up to the sides of his head, and it made him shiver through and through. That is not necessary to-day; you can catch the expression of your sitters without doing that; you can avoid giving them the "shivers," and catch them as they come; but first you must understand them. You meet people and you don't like them at first; you say, "I don't like that man." By-and-by you learn to know him better, and you do like him; and usually these are the firmest friendships that begin just that way. Try to take your sitters and get in touch with them. Let me tell you of two young men who both clerked in the same store; both were of equal intelligence, bright in looks, and dressed well. One Saturday night they both started out from Cincinnati to a country place to spend Sunday, and come back on Monday. Charley was cold-blooded and calculating, and while he met people, and they were free with him, genial and pleasant and cordial; yet Harry saw everybody and talked with everybody; so next Monday the two came back to their accustomed routine, and the following Tuesday the old farmer whom they had visited came into the store; Harry at once went up to him with a "How d'ye do? how is your wife, and the young man we met at dinner—I cannot call his name now?" &c. He at once put himself in touch with the old man. The result was that that farmer ever after would pass by Charley with a civil "How do you do?" but he always had Harry to wait on him, and Charley never could understand why the old man didn't take to him. There are a good many of you people who are too busy to take care of your customers. I heard a story out West while I was gone away of a certain man going into a gallery out there, and the proprietor was too busy to see him. The lady in the

reception-room took in word that a gentleman was in waiting, and returned with the message that the proprietor was too busy to see the gentleman then. The caller went out and never came back. That is the greatest blunder in the world. Lord Essex, of England, became Lord Chancellor by taking the cloak off his back and spreading it in the mud so that Queen Elizabeth might step from the carriage to the curb with her feet unsmeared.* That was an act of courtesy that has gone down into history, and his name has gone with it. Little things that you do in your galleries, in your studios (not in your "operating" room), in your workshop, are the things that make you friends: they are the things that count. It is the dollars that you don't see that come into your pocket by-and-by. Treat all your people as though they were the only customers you had. Make them feel at once that everything depends on their patronage, and not that you simply bring them out, and take them before the camera, take out the bung, and take their picture, and tell them to come to-morrow for it, or day after to-morrow, as some of my audience suggest, and then give them anything you have got, and make them take it and make them feel that it is the best. Be lavish with your plates, and stingy with your paper; that is, don't be afraid to use enough plates to secure a good negative; then be stingy enough with your paper to print only from the best negatives you can secure. But by all means get in touch with the people; make them feel that their interest is yours, and that you wish to make pictures of them that will speak, that are the best that can be made. Make up your mind that you will be the best photographer in your city, that you are going to lead, that you are going to demand and obtain the best prices for the best work.

PROFESSOR A. H. GRIFFITHS.

A NEW CRUSADE.

RIGHTLY or wrongly, to Paris has long been assigned the disagreeable reputation of being one of the chief centres for the distribution of risky and improper photographs, and recently the mutoscope has been pressed into the service of this salacious traffic. Matters have been carried to such audacious extremes that the authorities have intervened for the purpose of suppressing the scandal. The Paris correspondent of *The Referee* writes: "To no man do I accord a higher esteem than to Senator Berenger. He fears no one, and amid a howl of jeers and derision he attacks no matter what kind of amusement, or literature, or illustration, that he deems likely to pollute the mind of the young or the slightly older. I make that concession to him, and then I would respectfully ask how he runs his up-to-date morality show. He has by his endeavours induced the police to seize a quantity of illustrated post-cards, which were being openly sold and exhibited in the shop windows. That is a good move, because the sale of this kind of art was becoming a painful feature of Paris life outside the cafés. There was hardly one well-made *figurante* of the music-halls that did not willingly pose in various attitudes with attendant costume that suggested the going-to-bed attire. All this was duly photographed and reproduced on post-cards, and was on sale to the smallest urchin for one penny. This annoyance, that has rendered the terrasses of the cafés of the Boulevards impossible to any Englishman with lady friends, has been going on since the opening of the Exhibition, and, if, as it seems, Berenger is the only man who can scrub Dame Immorality by the neck, why did he not do it before? He has, however, it seems, got the police to seize these photographs and post-cards, and folks are saying what a wonderful man he is. Admitting at once that he has secured the seizure of the photographs of the minor lights of the stage in the various sections of their preparatory somnolent process, I would ask M. Berenger if he is not aware that for the last seven years this sort of show has been a feature of Parisian life in theatre and variety hall. I was not particularly well last week, and during a few off-days I wandered through the Exhibition with the carefully concealed intelligence common to the average tripper. I was on Government territory, and I wasted a few pence by looking at the revolving shows, allowed and approved by M. Picard and M. Millerand. I can candidly say this much, that they were pointless, and that their only possible object was to be suggestive, and unpleasantly suggestive. If M. Berenger really means to carry out his task, then let him go not merely for simple photographs, but for those pictures that are, by these modern contrivances, turned into living studies. The average child, once out of swaddling clothes, has probably arrived at the conclusion that his father and mother do not sleep in their hats and boots, but I am at a loss

to understand why, in the year 1900 as ever was, they should be carried at every corner to see exactly what a complicated training was necessary to divest in order to get to bed. These shows are disgusting, and I hope that what I have just heard is correct, and that the police will seize them, and that the proprietors will be prosecuted. I care no more about a high state of prudery than a monkey does about logarithms; but, when I see a crowd of children hanging round one of these penny-in-the-slot shows, and seeing what the hardiest Palais Royal frequenter would blush at, I say that it is time to kick, and I hope with all sincerity that Berenger will come out on top."

The *Daily Telegraph's* representative in Paris also tells us that the *corps-de-ballet* of the Grand Opéra has objected to the wrongful uses to which their photographs are put. He says that photographers have made free with likenesses which the dancers had had taken, but which they intended to be reserved for their personal use, and not to be converted into public property. These pictures have been fraudulently sold to various purveyors of illustrated post-cards, pocket biographs, and so-called miniature mutoscopes, as well as views for large cinematographs. For some time past the police had been contemplating interference with this sort of trade, in which there has been a wild boom since the Exhibition opened, but had not so far taken action in the matter, when a reproach for their backwardness came in the shape of a protest from a quarter whence possibly they hardly expected it. The ladies of the Opéra ballet forwarded a petition, requesting the seizure of various pictures in which their photographs had been reproduced entirely without authorisation. They objected to appearing in mutoscopic and other views, particularly as their consent to such exhibitions had not been asked by the unscrupulous purveyors of the entertainments. Thus roused by the action of the professional beauties themselves, the police have immediately set to work with tremendous zeal. They have confiscated no less than 50,000 picture-cards, 600 photographs, 400 pocket mutoscopes, and 40 cinematograph views. The new crusade starts rather late in the day, it is true, but, for the sake of photography in general and the "animated" branch of it in particular, we wish the Paris censors the utmost success in their clarifying aims. Years ago the stereoscope and stereography fell into popular disrepute on account of the disgraceful binocular subjects that were printed and widely published, and it would be a thousand pities if a similar reason led to the ostracism of animatography. But some such danger is to be apprehended if a check is not put upon the doings of low-minded people at home and abroad who simply photograph for corrupt purposes.

THE METRIC SYSTEM.

LAST week we gave a general summary of the information supplied by British Consular and other officers abroad relative to the experience of foreign nations who have adopted the metric system. Our contemporary, the *Pharmaceutical Journal*, gives some details of a particular character which are of interest in connexion with the time taken for the introduction of the metric system. It appears that the experience of Austria and Hungary shows that a transition period of four years was quite sufficient to prepare the public for the compulsory use of the new system, and there is not the smallest desire evinced in any quarter to revert to the older and more cumbersome method. In Belgium it took about forty years to establish the new system, but it is now firmly established. Bulgaria has not yet got entirely rid of its old weights and measures, but the commercial classes prefer the newer ones. Denmark had not adopted the metric system at the time the report was prepared in November last. France and Germany, of course, find the metric system perfectly satisfactory, and desire no change, though the older systems are not yet forgotten by the public. In Greece, where the metric system is not yet compulsory, though it has been legally established since 1836, the general public will not make use of it. Italy has found the transition difficult, and in some parts of the country it is still far from complete; in its practical operation, however, the metric system is stated to be quite satisfactory, and there is no question of going back. The Grand Duchy of Luxemburg agrees with Belgium, France, and Germany on the subject; Montenegro finds the new system works well; the Netherlands, Portugal, and Roumania have got it established satisfactorily, after more or less trouble. Russia can only point to unhappy Finland as having successfully introduced the metric system, but Servia has proved it to be satisfactory in practice. Spain is adopting it gradually, town by town, much passive resistance having to be overcome in substituting the new for the old system. That resistance is found to proceed from ignorance on the part of the public of the relations between the two systems. Knowing how much they require of certain articles, purchasers ask for

* The Professor probably means Sir Walter Raleigh, who, however, did not become Lord Chancellor.—Eds. B. J. P.

what they require in terms of the old weights and measures because they are ignorant of the corresponding amounts for which they should ask in accordance with the new system. Sweden and Norway have effected the change without any great difficulty, Switzerland has also adopted the metric system in its entirety, and only in degenerate Turkey have the authorities had to repeal the law which made that system compulsory. With that exception, in every country where the metric system has been adopted it has been found an improvement on older systems, and there is no desire to revert to former conditions.

MARINE PHOTOGRAPHY.

THERE are still some weeks left in which the holiday-making photographer can select his opportunity for photographing yachts and other vessels when they appear near his favourite seaside resort, and, for the benefit of those who are inclined to use a few plates on subjects of this kind, we reproduce the following succinct notes of advice. The writer presumes that something larger than a hand camera is to be used, for the reason that, although quite as good results can be had with such a camera as with a larger one, there is too much temptation with the small size to expose on everything that comes along, and this tends to carelessness and poor work. The camera should not be less than 10×8 , and it may be as much bigger as the operator is inclined to have it. The plate-holders must be beyond suspicion, as far as light-tightness is concerned, and there must be no flapping focussing cloth around. The shutter may be any of the fast-moving instruments of the day, without vibration and not given to stick by reason of damp at some awkward moment. A finder is absolutely necessary, and the most useful is one which gives, on a fairly large scale, a direct proportion of what is given on the large camera. The writer adds that he has used a 5×4 camera with a seven-and-a-half-inch focus lens as a finder for a 20×16 camera with a thirty-inch lens, the two having the same movements for raising and lowering the fronts. Focussing to scale is advisable, and the scale should be made up at home, any open view with marks set up at various distances, and the camera marked accordingly. "We will assume your eye to be on a schooner running free with all sail set; there are plenty of strong clouds about; there are few occasions where the lack of clouds is admissible. Your aim must be to cut her off and get on her lee bow, as photographs taken to windward are seldom good. See your dark slide is out, your shutter bulb in hand. Now watch through your finder till you get the size you want, snap your shutter and close up your plate, and turn out for something else. This watching for the right moment requires coolness and quickness, for, if you miss the instant when the best effect is to be gained, you seldom have time to get another chance. In photographing racing yachts," concludes the writer, "the photographer must be extremely careful not to get to windward of the yachts and spoil their wind; you will only get yourself hated and do no real good by getting to windward. The best place to get yachts is to leeward, and when they turn the mark-boat, but whoever has the camera and the boat can soon find out for himself where the pictures come." The article from which we take the above extracts appears in a recent number of the *Photo-Beacon*, and it carries at foot the initials "W. H. H." If we are not mistaken, these stand for Mr. W. H. Hyslop, from whose pen contributions on the subjects of orthochromatic and marine photography appeared in our pages thirteen or fourteen years ago.

ROYAL CORNWALL POLYTECHNIC SOCIETY'S PHOTOGRAPHIC EXHIBITION.

[JUDGES' REPORT.]

THE Judges in this department congratulate the Society on the fine display of pictures brought together, which have been difficult to get, owing, no doubt, to the unsettled state of the times. In the professional section there are some very interesting works of large size, notably Mr. W. J. Byrne, of Richmond, who sends some very fine direct work in portraiture; Mr. J. C. Douglas, of St. Ives, is well represented, and the quality is greatly in advance of his work of former years: Mr. W. Brooks, of Reigate, sends ten pictures, some of large size, of course not for competition, he being one of the Judges; Mr. J. H. Coath, of Liskeard, is well to the front again. In the Amateur Section the work is good. Mr. Henry Speyer, of Alpine fame, shows a marvellous picture (panoramic), which gives the whole circle. In the Photographic Apparatus Section, Messrs. J. H. Dallmeyer, Limited, of London, send for exhibition a camera fitted with their latest improved tele-photo lens. To enhance the value of this exhibit, and show its full capabilities, Mr. Brooks has taken several pictures without the tele-photo attachment,

which gives a very small distant picture, and then from the same position with the tele-photo attachment, the subjects being from one mile to over two miles distant, the result giving the impression that the negatives were taken about twenty or thirty yards from the subject, being absolutely sharp and clear, which practically demonstrates the utility of the apparatus. These specimens are exhibited in the glass case with the instrument. To this section, Mr. Thos. Thorp, of Manchester sends a very interesting collection of his replicas of diffraction gratings, being casts from Rowland's metal gratings of 14,438 lines to the inch. He also shows some direct-vision spectrosopes, giving a very brilliant spectrum, far superior to and cheaper than those constructed in the usual way with a series of prisms. These spectrosopes are very useful for screen-testing for three-colour work. He also shows a negative of the solar spectrum, and the spectrum of iron, taken by these reproduced gratings, which no doubt will be of great service in the future. Messrs. Shew & Co., of Newman-street, London, show some very ingenious cameras, &c.

PROFESSIONAL SECTION.

The first in the catalogue are the work of Mr. W. Illingworth; he takes an award of a first bronze medal for a study of a tramp; the same artist has several other meritorious productions.

Mr. P. Garland shows some careful work, some of them tend to hardness. Mr. A. A. Jane sends a number of pictures; the Judges think there is a slight improvement in his work to former years, and they think there is still room for greater improvement, some of his pictures are very flat and wanting in high lights; he also shows some work done with a spectacle lens; in an exhibition the result is the test; it matters not whether the lens cost only one farthing or 50*l.*

Mr. J. C. Douglas, of St. Ives, is well to the front with a large and varied collection, and the Judges are pleased to note the great advance in the quality of this exhibitor's work, his sea and wave studies are charming; (No. 27), *The Sunken Rock*, is perfect as a picture, and also in technique; to this has been awarded a second silver medal, his other exhibits are well worthy of close inspection. Mr. R. A. Jowett sends two pictures of the *genre* type, a little too stagey in effect. Mr. W. Norrie sends a frame of well-chosen cloud and sea studies which are charming; he takes first bronze medal. Mr. J. L. Shawcross is represented by pictures showing careful study. Mr. A. Patterson sends some good work, the same also may be said of Mr. G. Bird. Mr. C. M. Wane takes first bronze medal for his *Study of Swans*; his *Military Sports* is well worthy of attention.

Mr. H. C. McBurney sends some good examples. Mr. H. T. Jessop sends a pretty little *genre* picture; his enlargement, *A Young Briton*, wins first bronze medal. Mr. W. J. Byrne, of Richmond, shows some exceedingly fine work in his well-known style. No. 89, *Study of a Head*, is life-size taken direct, and it is a masterpiece, taking first award, viz., first silver medal. He also has two other large portraits of great merit, and also a large frame of home portraits which are very interesting. Following next is a large and varied series by Mr. J. H. Coath, of Liskeard, his *genre* picture, *A Faithful Guardian*, second silver medal. A large dog and child well posed and in keeping with title, all his other exhibits are of a very high order. Mr. W. M. Harrison, of Falmouth, receives first bronze medal for his enlargement of *H.M.S. Ganges leaving Falmouth*, the same exhibitor sends some portraits. Mr. E. Baker sends some good work. Mr. J. M. Whitehead has been awarded a first bronze medal for a pretty little study of fruit beautifully grouped and very effective.

AMATEUR SECTION.

Mr. A. E. Berg sends two pictures of merit. Mr. W. R. Bland sends a fine interior of *Wirksworth Church*. Mr. E. A. Rees sends a picture, *The Mill Wheel*, fairly good. Mr. E. Griffiths takes second bronze medal for an enlargement of the wreck, *Peace and Plenty*, on the Cornish coast. The subject is well rendered. Mr. T. P. Padwick is represented by five examples of his work. No. 161 (*A Sussex Pasture*), a picture of sheep grazing, is very effective and artistic. To this has been awarded a first bronze medal. *Anchored for the Night* is also well rendered. *The Morning Paper*, a figure study reading. This is too much out of focus and woolly to be pleasing. Mr. C. H. Dymond sends some pretty examples. Mr. W. J. Nicholls shows some very artistic and effective little pictures, (No. 184) *A Squall*. A second bronze medal has been awarded Mr. J. W. Welsh for five frames of good subjects. Mr. Henry Speyer sends one of the finest examples of Alpine photography, giving the whole circle, taken from the Grosvrescheron. The manipulation is perfect. It is printed in platinum from nine negatives carefully joined, and the tone throughout is very even, and the delicate gradations in the snow are very effective. The Judges have awarded this picture a first silver medal. Mr. G. Hepworth sends a frame of three views of Beverley Minster in his well-known style. Mr. J. T. Coleman sends some examples of Truro Cathedral. Several of them show halation and also evidences of flare, and some of the lines are not upright, which can be overcome by practice. Mrs. James Blamey shows some fine examples of hand-camera work, and receives a second bronze medal. A great improvement on her former work is very noticeable. By the same lady is a frame of *Studies of Dogs*, which show skill and careful work. Mr. C. H. Oakden shows a very fine interior, *The Ambulatory Abbey-dore*. To this has been awarded a first bronze medal. Mr. G. Cleland sends two examples.

PHOTOGRAPHIC APPLIANCES, &c.

Messrs. J. H. Dallmeyer, Limited's tele-photo camera and lens have been fully tested practically by Mr. W. Brooks, and the Judges have awarded a first silver medal.

Mr. Albert Maurice sends several models of appliances; several are far from new, and others have been on the market for a long time.

Mr. H. Coventry sends a plate and film-washer, which is said to wash plates and films effectively in ten minutes. The Judges think this open to doubt.

Mr. Thomas Thorp, of Whitefield, Manchester, sends some very important exhibits, before mentioned. The Judges have awarded this gentleman a first silver medal for his replicas of diffraction gratings and direct-vision spectrosopes, and consider it an award most worthily bestowed.

Messrs. Shew & Co., of London, make a large exhibit in cameras and appliances. The workmanship is of high order, and the price of the various instruments is very reasonable considering the good work that is put into them. Awarded first bronze medal for ingenuity and workmanship.

W.M. BROOKS.

(From a Representative.)

For many years this has been an annual event, a section of the Society's general Exhibition, but last year there was no show. The present is the sixty-seventh Exhibition of the Society, which was founded to encourage good craftsmanship, science, and art in a day when such was not so much the vogue as now. It has always helped photography by considerable encouragement in the way of awards. The Photographic Section has been under the care of Mr. W. Brooks, of Reigate, who has worked assiduously, with the help of local gentlemen, to do the best with the work submitted. The present show is by no means so numerically strong as many that have preceded it, but it is certainly the best in average quality, and the highest that has been held. The falling off in numbers had made for gain in the comfort of observing and the better hanging. The following is the classification:—

PROFESSIONAL.

Outdoor Photography.—1. Landscape, not less than 20 x 16 inches. 2. Landscape, 12 x 10 inches, and under. 3. Genre. 4. Architectural (exterior). 5. Instantaneous, including Marine. 6. Animals. 7. Enlargements.

Indoor Photography.—1. Portraits, not less than 20 x 16 inches. 2. Portraits, 15 x 12 inches, and under. 3. Home Portraiture. 4. Still Life, Flowers, &c. 5. Interiors, Architectural or otherwise. 6. Enlargements.

AMATEUR.

1. Landscapes. 2. Architectural, Exterior or Interior. 3. Alpine Scenery, including Caucasian. 4. Hand-camera Work, not less than twelve examples, quarter-plate. 5. Instantaneous, including Marine. 6. Still Life. 7. Enlargements.

Apparatus.—Photographic Apparatus generally, including the Lantern and its Appliances.

On the walls the classification is not apparent, but this is no disadvantage, as the room is not particularly well adapted to the purpose, and the pictures are grouped as they will fit. Perhaps at no Exhibition of this calibre do so many works come from single individuals, so that it comes out the number of exhibitors are proportionately fewer in relation to works than is usual. Mr. W. Illingworth contributes 6 frames; Mr. P. Garland, 5; Mr. A. A. Jane, 14; Mr. John C. Douglas, 20; Mr. R. A. Jowett, 2; Mr. Wm. Norrie, 1; Mr. J. L. Shawcross, 3; Mr. W. Brooks (not for competition), 10; Mr. A. Patterson, 5; Mr. Graystone Bird, 4; Mr. C. M. Wane, 3; Mr. H. G. McBurney, 10; Mr. H. Trevor Jessop, 4; Mr. W. J. Byrne, 4; Mr. John H. Coath, 16; Mr. W. M. Harrison, 4; Mr. E. Baker, 4; Mr. J. M. Whitehead, 1; Mr. A. E. Berg, 2; Mr. W. R. Bland, 1; Mr. E. A. Rees, 1; Mr. E. Griffiths, 2; Mr. T. P. Padwick, 5; Mr. C. H. Dymond, 19; Mr. W. J. Nicholls, 5; Mr. John W. Welsh, 5; Mr. Henry Speyer, 1; Mr. George Hepworth, 1; Mr. J. T. Coleman, 2; Mrs. James Blamey, 4; Mr. C. H. Oakden, 1; and Mr. George Cleland, 2. It will be seen that very few persons are represented by one frame.

The awards for pictures are:—

First silver medal: Messrs. W. J. Byrne and Henry Speyer. Second silver medal: Messrs. J. H. Coath and J. C. Douglas. First bronze medal: Mrs. James Blamey, Messrs. W. M. Harrison, W. Illingworth, H. Trevor Jessop, William Norrie, C. H. Oakden, T. P. Padwick, C. M. Wane, and J. M. Whitehead. Second bronze medal: Messrs. E. Griffiths and W. J. Nicholls.

In the Apparatus Section the following awards were made:—

First silver medal: Messrs. J. H. Dallmeyer, Limited, and Thomas Thorp. First bronze medal: Messrs. James Shew & Co.

Of Mr. W. Illingworth's varied contributions, all of high merit, but varying in subject, perhaps there is no better bit of work than *A Study of a Tramp* (No. 3), for which a first bronze medal is awarded. The model has a very fine head, and as a bit of portrait work this example is most excellent. Mr. John C. Douglas is another worker who has variety and

quantity, and all his work is clean and praiseworthy. *A Stormy Evening* (No. 26), and *The Sunken Rock* (No. 27) surf and rock studies with combination of cloud-laden skies, are strong, the second-named getting a second silver medal. His *Old St. Ives* (No. 28) is a study from ship to shore of the place that has perhaps more artists to the square acre of beach than any place in England. This Cornish town is full of photographic subjects, as well as being a painter's paradise. The group of children entitled *The Smile* (No. 35) is happy, and the smile is broad and ample. His *Sea Urchins* (No. 37) tells its own story well. Mr. William Norrie has a set of small prints—*In Storm and Calm* (48)—which are sea- and sky studies, but they are very fine; if set large and the work of the artist in colour, some of them would be magnificent. For these he deservedly gets a first bronze medal. Mr. Charles M. Wane has for years shown himself a lover of swans, and he keeps to his text with great ability. He has a frame of *Studies of Swans* (No. 72), and *A Quiet Corner* (No. 71). The latter is evidently an enlargement; but it is a very charming thing, swans in the quiet corner of a pond or lake, with happy combinations of red and surroundings. For this he gets a first bronze medal. His *Military Sports* (No. 73), tent pegging, &c., is full of life and vigour, and he is happy in several cases in having secured his impression at the right moment. Mr. H. Trevor Jessop has a very commonplace treatment of a very ordinary arrangement of a nude child, *A Young Briton* (No. 88), for which he is awarded a first bronze medal. In its way, though there is nothing extraordinary about it. Mr. W. J. Byrne's *Study of a Head* (No. 89), life size and direct, is good; and the award is a first silver medal—possibly a hardly warranted distinction. Mr. John H. Coath has been known for a number of years for his fanciful treatment of children in combination; he has departed from this strictly pronounced manner, and has work in variety. He gets a second silver medal for *A Faithful Guardian* (No. 95), a little girl asleep across the body of a St. Bernard dog, another smaller one lying near by. But he has more pictorial and better work surely in *What is it?* (No. 105), a group of boys "mit nodings on," standing on a rock jutting into the sea, with their backs to the spectator, and keenly interested, every muscle and attention strained, watching something ahead. It is one of the best things he has ever done. He has a faculty for handling animals, and *Playmates* (No. 96), a girl and a setter resting together, is a good example. Mr. Wm. Harrison has set on record *H.M.S. Ganges leaving Falmouth*, for which he has a first bronze medal. This old craft, a three-decker, was removed from Falmouth the other day by the inexorable fiat of the Admiralty, to the sorrow of all concerned. The picture is interesting, if not great. Mr. Edmund Baker's *Spare Moments* (No. 113), a pretty child and a kitten at an open window, is not without quality. Mr. J. M. Whitehead has a fine *Fruit Study* (No. 167), for which he secures a first bronze medal. It is in every way admirable. *The Silent Ebb* (No. 151) and *Towards Evening* (No. 152), by Mr. A. E. Berg, are examples of the soft, mud flat order, but they are, after that, of some artistic excellence. Mr. E. Griffiths is the recipient of a second bronze medal for *Wreck of the "Peace and Plenty"* (No. 155), but for what reason it is impossible to discover. The subject is by no means interesting, and the work is certainly of only average merit. Mr. S. P. Padwick has versatility. He secures a first bronze medal for *A Sussex Pasture* (No. 161), which might be much better than it is by a little carelessness in printing, so that the foreground, mid-distance, and background could have some change in value. His portrait work in *The Morning Paper* (No. 157), an elderly gentleman engaged in getting at the news—though, perhaps, a little too much at arms' length—deserves praise. *The Old Style and the New* (No. 158), a study of shipping on a river lit up with sparkle, and over which there floats smoke and steam, is most interesting. Mr. C. H. Dymond has many things on view, but none of them stand out strongly—though the average merit is most commendable. His *The Fringes of the Hearth* (No. 180) is not quite commonplace, but the subject has been fully done. *On the Tamar, near Calstock* (No. 178), wants some gradation in the whites, but the picture has a nice soft quality. Mr. W. J. Nicholls' *A Summer's Morning* (No. 182), a combination of lake, mountain, and fir trees, is a very enjoyable picture, exceeding in quality, in every way, surely, his *A Squall* (No. 184) for which he is awarded a second bronze medal. The suggestion of the squall is most remote, and the subject is treated on too small a scale. Mr. John W. Welsh has a charming little thing in *Sea Urchin* (No. 186), a row of mirthful nude lads upon the sands, all seated in varying and natural manner, brimful of something which has fun in it. There is rather a fine study of fir-trees by him in a series of twelve quarter-plates (No. 190) in one frame. His *Lugger Inn, Fowey*, is a tit-bit from one of the Cornish villages that photographers might with advantage look up. There is good work indeed in three architectural subjects in one frame by Mr. Geo. Hepworth. A very beautiful *Panorama from the Gross Viescheron* (No. 191), by Mr. Hy. Speyer, giving mountain-peaks, glaciers, snowdrifts, and crevasses with fine rendering of tone value, has deservedly won a first silver medal. Mrs. James Blamey shows three enlargements (No. 195) which have quality in each case, but one is greatly superior to the rest. The same lady gets a first bronze medal for some instantaneous (No. 198) work on the sea beach. *The Ambulatory, Abbeydore* (No. 199) is an example of Mr. C. H. Oakden's best work, an interior full of charm, and rendered in the way we are accustomed to see with this worker. He is awarded a first bronze medal. Mr. W. Brooks, of Reigate, who has helped the Society for so many years by his care of

the Photographic Section, has a valuable contribution of ten exhibits, all of the best quality, and which is rather a revelation, because Mr. Brooks is not a contributor to exhibitions in a general way. None of his exhibits are for competition. He has two portrait studies of *A Tower Warden* (Nos. 52 and 53), which are as fine things of their kind as we remember to have seen. The model is a handsome old man, and, of course, the uniform of a yeoman of the guard helps the picturesqueness of the study. There is nothing finer of its kind in the exhibition than these. *A Surrey Lane* (No. 54) is a very delightful bit of landscape, admirably selected and perfect in technique. *A Pond in the Wood* (No. 56) is a gem of its kind, but it would be far more effective if very much larger, the abundant detail being almost obtrusive. An architectural example, *Reredos, Truro Cathedral* (No. 61), shows that this worker can ably render a very difficult selection. We hope to see the figure subjects at one of the principal exhibitions.

In the matter of photographic appliances the Exhibition is not numerically strong, but it is high class. Messrs. J. H. Dallmeyer, Limited, show tele-photo apparatus and lenses, and are awarded a first silver medal. Mr. Thomas Thorpe shows spectrometers, transmission gratings, and is distinguished with a first silver medal. Messrs. Jas. Shew & Co. show a lot of their Xit cameras and other photographic apparatus, for which a first bronze medal is awarded.

THE CITY AND GUILDS EXAMINATIONS IN PHOTOGRAPHY.

FROM the programme of technological examinations held under the auspices of the City and Guilds of London Institute that has been sent to us we extract the following particulars relating to the examination in photography that will be held in May next:—

The Examination in Photography will consist of two parts:—Section A, Pure Photography, and Section B, Photo-mechanical Processes. Candidates may be examined in either of these two Sections.

ORDINARY GRADE.

The Examination in the Ordinary Grade of either Section will consist of a *Practical* and a *Written* Examination.

No candidate will be admitted to the Written Examination who has not previously passed the Practical Examination.

To enable Candidates to qualify for the Written Examination in the Ordinary Grade, Local Practical Examinations will be held at convenient times in the Session preceding the Written Examination. A practical Examination may be held in any town where there is a class registered by the Institute, or in such other places, distant ten miles from the class, where at least five Candidates notify, through the Local Secretary, their wish to be examined. The Local Examinations will be held under the personal supervision of Examiners appointed by the Institute. The date at which a Local Examination is to be held may be fixed at any time between January 1 and March 2 that may be arranged between the Secretary of the Local Committee and the Local Examiner, provided that at least fourteen days' notice is given to the Institute of the date fixed for such Local Examination; and the Local Secretary will be required to forward to the Institute, within eight days after the holding of such Examination, under the signature of the Local Examiner, the names of any Candidates who may have satisfied the Examiner of their practical knowledge of photography. The subjects of the test are given in the Syllabus of each section.

The Candidate for the Practical Examination in either section may elect to make his negative in collodion or gelatine, and his print may be produced by any of the methods in ordinary use. He will also be allowed to supply, if he so desire, his own apparatus, chemicals, &c., or he may use those provided by the Local Examiner. The fee for the Practical Examination only will be 2s. 6d. The fee for the Written Examination is 1s.

SECTION A.—PURE PHOTOGRAPHY.

I. *Syllabus.*—(1.) The Local Practical Examination will include the following tests:—To focus, expose, and develop a negative of a person or landscape; to print, tone, fix, and mount an ordinary print.

(2.) The Written Examination will include questions on such subjects as the following:—

1. The elements of Photographic Optics. The Photographic Camera and its adjuncts, lenses, diaphragms, shutters, shades, &c.
2. A general knowledge of the practice and theory of the wet-plate process.
3. The practice and theory of the gelatine dry-plate process, exclusive of emulsion-making; the composition of and defects in gelatine dry plates; the defects of gelatine negatives, their causes and remedies.
4. Various methods of developing, fixing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.
5. Silver printing by print-out processes, including vignetting and printing in clouds, toning and fixing; contact printing on gelatino-bromide paper.
6. Retouching and spotting; mounting prints.
7. The lighting of the dark room.
8. The studio and lighting of the sitter.

SECTION B.—PHOTO-MECHANICAL PROCESS.

(1.) The Local Practical Examination will include the following tests:—

To focus, expose, and develop a negative of a drawing in line or wash; to prepare or etch a zinc or copper plate (a) for a process block, (b) for a photogravure plate; to make a collotype plate or a photo-litho transfer.

(2.) The Written Examination will include questions founded on the following subjects:—

1. Cameras and lenses for copying and process work, ruled screens, prisms, reversing mirrors, the appliances in ordinary use for electric and artificial lighting for photographic purposes, and the apparatus employed in photo-mechanical processes.

2. A practical knowledge of collodion (wet and dry), and gelatine dry-plate photography.

3. A general knowledge of various methods of developing, fixing, intensifying, and reducing negatives.

4. A general knowledge of the properties of gelatine, albumen, fish glue, bitumen, resin, inks, etching solutions, and other chemicals and materials used in photo-mechanical work.

The principles and practice of at least two of the following processes:—

5. Photogravure.

6. Block making—line, half-tone, and three colour.

7. Photo-lithography.

8. Collotype.

The Written Examinations in the Ordinary and Honours Grades will be held on Wednesday, May 1, from 7 to 10.

HONOURS GRADE.

Candidates for Honours in either Section must have previously passed in the Ordinary Grade of that Section.

The Honours Examination is both Written and Practical.

The fee for the Honours Examination (Written and Practical) in either Section is 3s. 6d.

For the year 1901, Practical Examinations will be held in London only, unless ten Candidates at least apply to be examined in the same Section (A or B) at some other centre.

SECTION A.—PURE PHOTOGRAPHY.

(1.) *Written Examination.*—Candidates will be expected to answer more difficult questions in the subjects for the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory of the photographic image, of development, fixing, intensification, and reduction.

2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.

3. The principles of photographic optics.

4. The theory and practical use of sensitometers for testing the speed and gradation of plates; and also their uses in printing processes.

5. The principles and practice of the preparation of gelatino-bromide and gelatino-chloride emulsions.

6. Collodio-bromide emulsions, their preparation and use.

7. Platinotype and carbon printing; other methods of printing with bichromate and with iron salts; enamels.

8. Enlargements and lantern slides.

9. Applications of photography to scientific and technical purposes.

(2.) *Practical Examination.*—Candidates will be required to show proficiency in conducting, in presence of the Examiner, any of the following practical operations:—

1. To develop gelatino-bromide plates previously exposed (correctly or otherwise) by the Examiner.

2. To reduce or intensify gelatino-bromide negatives.

3. To print, tone or develop, fix, and mount a silver, platinotype, or carbon print.

4. To test a sample of glass or fabric to be used in lighting the dark room.

5. To test the sensitiveness and gradation of a plate.

6. To find the focus of a lens either corrected or uncorrected, or to examine a lens as to its suitability for different photographic purposes.

7. To copy a drawing or engraving.

8. To make an enlargement from quarter-plate.

9. To make a lantern slide by contact or in a camera.

The Practical Examination will be held on Saturday, May 4, between 2 and 6.30, and at other times if found necessary.

(3.) *Specimen Work.*—Candidates will also be required to send in, not later than April 24, not fewer than three nor more than six negatives, not less than quarter-plate size nor more than whole-plate, together with mounted prints made from each of them by any ordinary photographic printing process or processes that the Candidate may select. The negatives and prints must be accompanied by a Statutory Declaration made by the Candidate to the effect that the selection of the subjects and the whole of the work (except the manufacture of the plates, sensitive paper, and mounts) involved in the production of the negatives and prints has been done by the Candidate without any assistance from any other

person, and within the twelve months preceding the date of the Examination. Forms for the Declaration may be obtained from the Institute.

SECTION B.—PHOTO-MECHANICAL PROCESSES.

(1.) *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects of the Ordinary Grade, and, in addition, to show a practical knowledge of the principles and operations in one or more of the following processes:—

1. Photogravure.
2. Line negatives and line blocks.
3. Half-tone negatives and half-tone blocks.
4. Chromo-typography (negatives and blocks for three-colour process).
5. Photo-lithography.
6. Collotype.

(2.) *Practical Examination.*—Candidates may be required to show proficiency in practical operations in one or more of the above processes, numbered 1, 2, 3, 4, 5, 6, including the preparation of negatives suitable for each class of work, from (a) pictures in colour, (b) drawings in monochrome, (c) originals in black and in tints, (d) natural objects.

Candidates in Section B may select the particular branch of practical work in which they desire to be examined.

In order that Candidates may know what apparatus and material they will be required to provide for the Practical part of the Examination in Section B, full information as to the practical tests may be obtained from the Examiner on Friday, May 3, for the Examination to be held on the following day.

The Practical Examination will be held on Saturday, May 4, between 2 and 7.30, and at other times if found necessary.

The Examiners for next year are Mr. C. H. Bothamley and Mr. G. Watmough Webster, and it is intimated that the Syllabus has been revised as regards Section A (Pure Photography), and the arrangements as regards the Practical Test in the Honours Grade have been altered. Candidates are required to submit Specimen Work.

The following questions were put to Candidates at the Examinations held in the spring of this year:—

ORDINARY GRADE.

SECTION A.—PURE PHOTOGRAPHY.

Eight questions only to be attempted.

1. Explain, with the aid of a sketch, why a single lens, when used with a stop either before or behind it, gives a distorted image. Why does a rectilinear lens of the ordinary form give no similar distortion?—30 marks.
2. Describe as fully as you can any one of the newer forms of photographic lenses, and state what are its merits and defects.—35.
3. What are the resemblances and differences between hydroquinone (quinol) and metol as developers? Describe fully how you would use each of them for the development of gelatino-bromide plates.—40.
4. How would you proceed to reduce a gelatino-bromide negative with a view to (a) increased contrasts, and (b) reduced contrasts?—30.
5. If you were building a studio for general portrait work, how would you arrange (a) the light, and (b) the blinds or screens?—40.
6. What tests would you apply with a view to ascertain the purity and general suitability of a new batch of mounts?—40.
7. What do you know about the causes of fading of prints on gelatino-chloride printing-out paper, generally known as P.O.P.?—35.
8. What is formalin, and what is its effect on gelatine? In what ways can this effect be turned to advantage in practice?—30.
9. What points have to be kept in mind when selecting pigments to be used for spotting prints of various kinds?—30.
10. What are the comparative advantages and disadvantages of plates and films respectively? How would you develop a long roll of films?—35.
11. What kind of shutter do you regard as best for all-round work, and why? What are the advantages or otherwise of fixing the shutter (a) before, (b) behind, and (c) between the lenses?—35.
12. When photographing a large group of people, what arrangement is best, with a view to secure good definition, freedom from distortion, and satisfactory grouping?—40.

SECTION B.—PHOTO-MECHANICAL PROCESSES.

Six Questions only to be attempted.

1. Describe the principle of making ruled screens for half-tone blocks, and explain the effect of these screens in the making of negatives for blocks.—50 marks.
2. Explain the use and working of a mirror or prism in negative-making.—30.
3. What means are adopted to reverse collodion and gelatine dry-plate negatives when made without the aid of a prism?—40.
4. What is collodion, and how is it prepared for negative-making?—50.
5. Describe the preparation of the resist and etching of a photogravure plate.—40.
6. Describe the processes of making negatives for line and half-tone blocks.—40.
7. State generally the principles of the preparation of tri-chromatic negatives.—50.

8. Give details of the process of etching line blocks on zinc.—50.
9. Describe the working of the enameline process on copper, and give details of the operation of etching the half-tone block.—50.

10. What do you know about the action of bichromate salts in solutions of gelatine? and explain in what way this action is made use of in the processes of photo-lithography and collotype.—50.

HONOURS GRADE.

SECTION A.—PURE PHOTOGRAPHY.

Eight Questions only to be attempted.

1. Why is the "effective aperture" of a lens diaphragm not always identical with the area of the hole cut in the diaphragm? How would you ascertain the "effective aperture" of a given diaphragm when used—(a) in front of a single lens; (b) behind a single lens; (c) between the two components of a rectilinear lens?—40 marks.

2. What are the advantages and disadvantages of pinholes and lenses respectively as a means of producing images? How does the size of the pinhole affect the definition of the image and the exposure required when photographing it?—35.

3. What character of gelatino-bromide plate would you prefer to use for—(a) dimly lighted interiors with strong contrasts, and (b) the reproduction of line drawings? Give reasons, and describe fully how you would develop in each case.—40.

4. Describe the methods of using uranium salts for (a) the intensification of gelatino-bromide negatives, and (b) the toning of gelatino-bromide prints. On what chemical changes do the processes depend, and what precautions must be taken to ensure success in each case?—35.

5. Explain fully the principles on which carbon printing by double transfer depends, paying special attention to the chemical changes, if any, that take place at each stage.—40.

6. What is the platino-type process? How would you keep, expose, and develop the paper? Give full reasons in each case.—30.

7. What do you know about the relation between the chemical constitution of organic compounds and their power as photographic developers?—35.

8. Describe and explain processes for producing (a) blue prints, and (b) black prints, with salts of iron, suitable for the reproduction of plans, drawings, &c.—40.

9. Write a concise account of the nature, use, and dangers of magnesium flash powders.—35.

10. How would you test a sample of red glass, intended for use in a dark-room lamp, with respect to—(a) effective screening, and (b) good illumination? Give reasons for your methods.—35.

11. Describe in detail the arrangement you would adopt for photographing an opaque object under the microscope.—30.

12. How would you proceed to obtain a direct enlargement on platino-type paper?—30

13. What points have to be kept in mind, and what special precautions or devices are necessary, when photographing objects for the purposes of a photographic survey or record?—30.

SECTION B.—PHOTO-MECHANICAL PROCESSES.

Eight Questions only to be attempted.

1. Give a description of the camera, screen, lighting, and appliances necessary for the production of negatives by the half-tone process.—40 marks.

2. How is collodion iodised for making negatives for line blocks? and give a formula.—40.

3. Describe "direct" and "indirect" processes for producing tri-chromatic negatives, giving particulars of the colour filters employed, and the treatment of the negatives.—50.

4. Give the working and formula for sensitising ordinary dry plates for the making of tri-chromatic negatives.—40.

5. Explain fully the treatment of dry and wet-plate negatives for the production of half-tone blocks. Describe stops, exposure, development, and other operations.—50.

6. What are the constituents of a sensitising bath for collodion plates? State how it is tested, and how kept in working order.—40.

7. Describe the working of the enameline process on copper, giving formula, and state if any modifications are necessary for using the same process on zinc.—40.

8. What is the "bitumen" process of printing on zinc, and how is it employed?—35.

9. Describe the process of making photogravure plates, giving details and formula.—50.

10. Describe fully, with formula, the process of etching line blocks on zinc.—50.

11. Describe fully, with formula, the process of etching half-tone blocks on copper or zinc.—50.

12. Describe fully, giving formula, the process of making photo-lithographic transfers, and printing the same on stone.—50.

13. Describe fully, giving formula, the process of making collotype plates.—50.

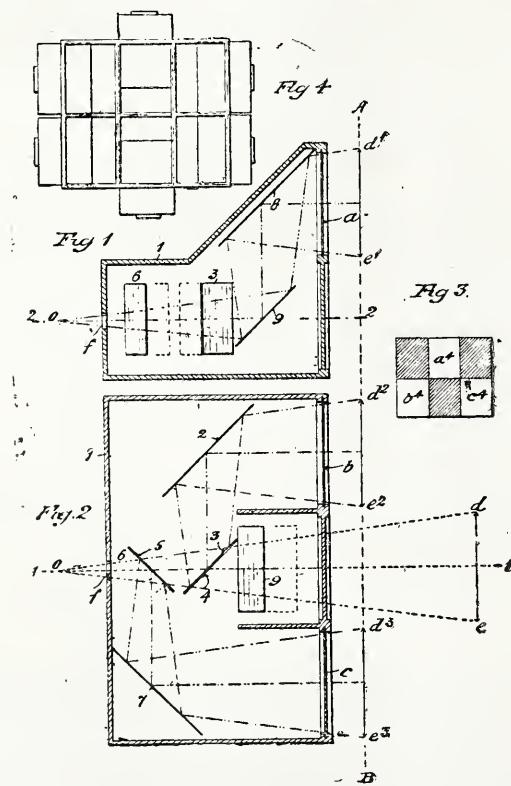
14. How are collotype plates printed, and what treatment is necessary to keep the plates in working order?—40.

15. State what kinds of paper are most suitable for collotype printing, and what operations are necessary for the production of glazed prints to imitate ordinary silver print photographs.—50.

DR. SELLE'S CAMERA FOR THREE-COLOUR WORK.

[Patent No. 13,666 of 1899.]

DR. SELLE says: "Ever since 1865, when Ducos du Hauron first gave some practicable methods for reproducing the colours of nature by means of a primary colour photography, it has been known that if in conjunction with three-colour filters light was transmitted through three monochrome transparencies representing the three primary colour sensations, three coloured images would arise, which when superimposed would yield an image in the three colours of the original. With a view of facilitating such projection and superposition, apparatus more or less identical was devised by Zink, Ives, Nadar, and others. The commercial value of such methods is, however, small. In the methods above referred to the three transparencies are projected in the colours of the light filters, *i.e.*, the monochrome image representing the blue sensation is transmitted blue, the monochrome image representing the red sensation is transmitted red, and the monochrome image representing the green sensation is transmitted green. But, when three colour sensations have to be reproduced on paper or other opaque substance either by pigment photography or by pigment printing, the pigment used must not be



of the same tint as the light filters or a false picture would result, but the tint must be spectroscopically complementary to the filters, *i.e.*, the red sensation image must be printed in green, the green sensation image in red, and the blue sensation image in yellow. I effect the reconstitution of a non-pigmentary coloured image by reflection projection instead of by transmission projection, and thereby obtain an image made up of the complementary tints. I achieve this by making from three negatives, obtained in the well-known manner, three positive black prints on a white opaque surface, preferably for instance photographic silver paper. If light be now allowed to fall on such prints and then by suitable means be reflected back through the corresponding light filters on to a common point the result will be a combination of three complementary colour images. If in such an apparatus I substitute sheets of white paper for two of such prints the third print will be seen coloured to a tint complementary to that of the filter through which it is seen. In this manner a printer can readily ascertain not only the tint, but the depth of pigment to be employed in printing the particular image, and he can also judge of the length of time for printing the negatives in the production of the printing blocks, matters of great importance because a three-colour print being in substance nothing else but an effect of various reflections of colour rays an excellent result can only be obtained if the tint and depth of the layers of pigment on the paper correspond with the gradations of the negatives. The reflection projection may be carried out by means of

suitably arranged mirrors, but with a view of facilitating this to non-experts, I have constructed an apparatus which apart from arrangement in detail is based on well-known principles. It is obvious that any other similar construction may be used so long as it meets the intended object.

"The apparatus is shown in the annexed drawing, in which fig. 1 is a vertical section on line 1-1 of fig. 2, and fig. 2 a horizontal section on line 2-2 of fig. 1. Figs. 3 and 4 are diagrammatic plan views of dark slides for use with the apparatus when used as a camera.

"A chamber or box 1 is constructed having in one wall three orifices *a b c* and in another wall an eyehole *f* or an eyepiece. Within the chamber are certain reflecting mirrors namely four opaque mirrors 2, 7, 8, 9 and two transparent mirrors 3, 6. The backs 4, 5 of the latter are coloured, that of the one 4 green and that of the other 5 blue, the green and blue coatings being also transparent. This apparatus views simultaneously three prints placed in the same plane A-B. One of these prints *d³ e³* is reflected from an opaque mirror 7 to a transparent mirror 6 and thence to the view point *o*. Another print *d² e²* is reflected from another opaque mirror 2 to the other transparent mirror 3 thence through the first transparent mirror 6 to the view point *o*. The last print is reflected from the third opaque mirror 8 to the fourth opaque mirror 9 and thence through the two transparent mirrors 3, 6 to the view point *o*. The opaque mirrors may be quicksilver mirrors.

"Whilst the course of the rays entering the apparatus follow well-known laws the reflecting devices are so arranged as to yield an image combining the greatest luminosity with correct superposition. The two transparent mirrors 3, 6 standing at nearly a right angle to each other are parallel each to one of the quicksilver mirrors 2, 7, all four being fixed on one base; the third quicksilver mirror 8 is placed as near as possible to the corresponding opening in the case so as to receive as bright and distinct an impression as possible and the fourth quicksilver mirror 9 is so placed that the rays reflected therefrom shall pass in a direct line through the two transparent mirrors 3, 6. The angles at which the rays are reflected from the prints being identical and the respective distances being equal they can be adjusted to coincide in superposition when arriving at the common viewing point *o*. The three openings *a b c* may contain the three light filters, but a red light filter at *c* is sufficient when the aforesaid coloured transparent mirrors are used, since in that case the latter act by themselves as light filters. The three monochrome black prints, having been mounted on a suitable support in a similar order to the position of the three openings or windows of the chamber, are placed at a sufficient distance at the back of the apparatus to allow day or artificial light to fall upon them. The prints thus reflected one over the other will give at the view point *o* a coloured image composed of three reflections in complementary tints. To explain the complementary reflection more particularly I will describe the procedure to be observed when it is intended to project the prints singly or in partial combination so as to serve as a guide and a proof to the printer. Assuming that the image to be reproduced is a black circle on a white ground, the positive prints will be three black circles on a white ground. Having placed these prints at the back of the apparatus as already described, we would first constitute the yellow image, since that is the colour with which printers usually begin, *i.e.*, the first print to be reflected would be the one *d² e²* representing the blue sensation. If the other two prints are covered up with black the uncovered print alone will be reflected, and will appear at the view point as a black circle on a blue ground. If now a white surface, a sheet of paper, for instance, be substituted for the black at one say *d¹ e¹* of the former prints, so that, for example, the light of the green filter will be projecting on to the former image, it will efface the black circle and give instead at the view point a green circle on a blue + green ground; if now a white paper be substituted for the black at the last covered print *d³ e³*, the red filter light will be projected on to the double projection already formed, so that the circle will appear red + green (yellowish) on a red + green + blue (*i.e.*, white) ground, thus yielding the yellowish image complementary to the blue sensation print. If again we reflect the print *d¹ e¹* before the green filter, covering up the others with white paper, we shall get a red + blue (*i.e.*, purple red) circle on a red + blue + green (white) ground, *i.e.*, the pinkish image complementary to the green sensation; if, lastly, we reflect the third print *d³ e³*, covering up the others with white, we get a green + blue = light bluish circle on a red + green + blue (white) ground. It will be seen from the above that if the three prints are reflected simultaneously the result is, minus, red green and blue, = black circle, on a plus red green and blue = white ground, or a reflection by subtraction on a reflection by addition.

Apart from its value to printers, the method is of great advantage to the amateur, since, in conjunction with the easily made silver prints, the reflection as described offers a ready means of producing the constituent negatives for a coloured picture. If a lens be fixed at the view point *o* and a slide containing the sensitive plate be placed at the back of the apparatus, the latter can be used as a camera. The three photographs are then taken either simultaneously or consecutively. In the former case the difference in actinism between the three groups of rays have to be provided for by retarding screens or other suitable equalising devices, in the second case the exposures are effected successively by making the re-

flections operative one at a time only. This is accomplished by substituting two removable opaque mirrors for the transparent mirrors, 6, 3 and withdrawing the first after the red exposure and the second after the blue exposure. Further, the successive exposures may be made by means of a special slide, as shown in diagram in figs. 3 and 4, namely, a frame having three openings $a^4 b^4 c^4$, corresponding with the openings $a b c$ at the back of the apparatus. The openings in the slide are provided with shutters as in fig. 4. The plate having been inserted in the slide, one would proceed by drawing the shutters at the three openings consecutively. It is obvious that, instead of taking the three images on a single plate, separate plates may be used for each aperture, which is the preferable course when it is intended to produce subsequently a photograph or print in pigments, or when plates of different colour sensitiveness are used. The slide may also have, as shown in fig. 4, six apertures and shutters instead of three, so that by turning the slide upside down it might be used for another series of exposures, and this again may be duplicated on the back of the slide, forming a double slide, suitable for four series of exposures."

Our Editorial Table.

The Photographer's Exposure Register, compiled by Mr. G. T. Fields-Clarke, M.S.A., and published by Mr. R. G. Porter, High-street, Bedford, at the price of one shilling, has columned spaces ruled for no less than nineteen entries relating to printing and developing. The careful photographer can record particulars as to (1) number of plate, (2) date, (3) hour, (4) direction of camera, (5) number of slide, (6) subject, (7) light, (8) focus of lens, (9) stop, (10) exposure, (11) speed of plate, (12) developer as per formula, (13) proportions A and B, (14) result, (15) brand of paper, (16) distance from flame, (17) exposure, (18) developer, (19) general remarks. Of the many exposure note-books that have been sent us, the one now under notice is certainly the most comprehensively planned. It appeals to the systematic worker.

CONVENTION PHOTOGRAPHS.

To the Convention mementoes with which he has already favoured us, Mr. S. H. Fry, of 12, South-villas, Camden-square, N.W., kindly makes the handsome addition of no less than seventeen portraits of "notable personages" in attendance at the Newcastle meeting. These portraits, which are all good and characteristic, were taken by Mr. Fry himself. Here is a list of the originals: Messrs. Frank Bishop, W. Barry, J. Crawford, W. J. Croall, J. Cox, W. E. Dunmore, J. Pattison Gibson, A. L. Henderson, C. Phipps Lucas, George Mason, J. Stuart (Glasgow), J. T. Sandell, Alfred Seaman, H. Snowden Ward, E. J. Wall, and G. Watmough Webster.

The Platinotype Company also send us a print in platinum from a negative of the President, taken at Newcastle-on-Tyne by the oxymagnesium lamp, which was so largely used there. Lighting and likeness have been pronounced good, and the portrait is declared to be an excellent example of the kind of work produced by the light.

News and Notes.

We are very sorry to learn of the death on Friday, August 24, of Mrs. Stuart, the wife of Mr. John Stuart, of Glasgow and Helensburgh. The deceased lady, who had been ailing some little time, endeared herself to all by her great courtesy and gentleness. We offer our friend, Mr. Stuart, our sincere sympathy in his bereavement, and we are sure we shall be joined in our condolence by very many readers of the JOURNAL.

An amusing illustration of the extent to which the mind of British youth is coloured with "khaki" tint, says a writer in the *Daily Chronicle*, comes from one of our public schools. According to the *Edmundian*, a natural science master desired his class to note that "hydrogen is not found in the free state." Subsequent investigation disclosed that every note book contained the startling information: "No hydrogen is found in the Free State."

We are pleased to hear that Messrs. West, of Southsea, are adding fresh pictures to "Our Navy," and are keeping it well up to date. By permission of the Lords of the Admiralty, one of the firm has spent the last three weeks on H.M.S. *Jupiter*, and has secured some excellent cinematograph series of the naval manoeuvres, such as evolutions of the fleet, ships in a heavy sea, heaving the lead, officers playing cricket on the quarter-deck, and sailors running along the boat boom to man the cutter, with one of them falling overboard and his mates to the rescue.

The Röntgen Society of the United States will meet in New York City, December 13 and 14, at the Academy of Medicine. Addresses have been promised by eminent men at home and abroad, and a successful meeting is assured. Visiting members may obtain information in X-ray work. It is especially desired that all those who are using the X ray in any way, either

professionally or experimentally, send their names and addresses to the Chairman of the Committee of Arrangements, Dr. S. H. Monell, 45, East Forty-second-street, New York City. The Society is the only one of its kind in America, and is for scientific purposes only.

THE Sefton Park (Liverpool) Photographic Society's Second Annual Exhibition will be held at the High Schools, Arundel-avenue, Tuesday, Wednesday, Thursday, Friday, and Saturday, October 30 to November 3, 1900. The Judges are Messrs. F. Anyon, Paul Lange, and Geo. E. Thompson. The following are the open classes: Landscape and Seascape, Portraiture and Figure Studies, Architecture, Hand-camera work (camera must have been held in the hand during exposure), Lantern Slides, Champion Class. Entry forms and fees only are to be sent to Mr. Geo. Birtwhistle, 7, Gainsborough-road, Sefton Park, Liverpool, who will send copies of the prospectus on application.

CRIPPLEGATE PHOTOGRAPHIC SOCIETY.—The first meeting of the new session will be held on Monday, September 3, 1900, at 7.45 p.m., when Mr. W. D. Welford, will give a demonstration on the new "Thornton Film." Applications for membership of this Society should be addressed to the Hon. Secretary, Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C., who will be pleased to supply the necessary particulars. The Annual Exhibition, held in conjunction with the Essex and Middlesex Cycling Union, Limited, will be held on November 7, 8, 9, and 10. Entry forms will be ready shortly, and may be had on application to the Hon. Secretary as above.

THE KAISER AND THE PHOTOGRAPHS.—The King tells the following anecdote of the Austrian Emperor: "During one of the audiences which he frequently holds at the royal palace overlooking the Danube, a Magyar blacksmith approached him, and, drawing from his pocket two photographs, asked for the signatures of the King and Queen. 'The Queen is not here,' said the King, 'and besides I cannot give you my signature at the present moment, for I have neither pen nor pencil.' 'I have brought a pencil with me,' said the smith. The King immediately did as his subject wished, and handed back the photograph with the customary bow of dismissal. But the smith making no attempt to retire, the King said, 'Is there anything else I can do for you?' 'Yes, your Majesty, I am waiting for my pencil.' The King searched his pockets, found that he had absent-mindedly appropriated it, and then returned it with a laugh."

"So much has been written in this column," says the art critic of the *Daily Chronicle*, "about colour prints, that no further reference would be made to the subject at the present moment but for the specimens that are being continually sent in, and for another protest from Mr. Holme. Mr. Holme says, at great length, that his colour prints in the *Studio* satisfy artists, and even deceive them into taking the reproductions for the originals. This is not to be doubted for a minute. Every one knows the story of Rembrandt picking up the gold pieces which his students painted on the floor—a story which would tell in Mr. Holme's favour. Mr. Holme also says that 'a drawing in flat tints suitable for reproduction by lithography or by wood blocks, is not well adapted to the half-tone block process.' But, certainly, the drawing in elaborate washes that appears as frontispiece in this month's *Studio* is scarcely suited to the half-tone or any other mechanical process. It is to be hoped that the reproduction, amusing as it is, is not a perfect facsimile of the original. There is another suggestion, too, that might be made to Mr. Holme—that he should give, in his table of contents, the names of the engravers who reproduce the colour prints in the *Studio*, and the methods by which these were done. It would be of extreme use to artists. Mr. Holme seems to think that drawings lose by too great reduction in size. Of course, some do. But that is not the question; it is simply that many colours, to say nothing of an endless range of tones, cannot be reproduced by any mechanical process whatever. Mr. Holme is doing very interesting, and at times very good, work in publishing these colour prints; but that is no reason why they should be declared perfect. A number of other prints have been sent in, among which a pastel drawing by Ludwig van Hoffman, reproduced by the Sellegraph process, and submitted by Mr. Roxby, does retain somewhat the effect of pastel in different passages. But it, too, is only a proof of the difficulties of colour reproduction, as other portions of the print are as crude as possible. In fact, the cruder the original is, frequently the better it comes out. A print of some fruit and flowers is more like the natural objects than the print is like art."

Patent News.

The following applications for Patents were made between August 13 and August 18, 1900:—

AUTOMATIC APPARATUS.—No. 14,459. "Improvements in and relating to Automatic Coin-free Photographic Apparatus." Communicated by E. Feret and M. Benart. A. F. SPOONER.

CAMERA.—No. 14,466. "Combined Plate and Film Camera." Complete specification. A. P. GILL.

FINDER.—No. 14,473. "Improved Finder and Levelling Device for Photographic Cameras." Complete specification. F. W. O. LISCHKE.

LENSES.—No. 14,487. "Improvements in Astigmatically Corrected Lenses." Complete specification. C. P. GOERZ.

DEVELOPMENT.—No. 14,530. "An Improved Method of and Means for Treating Exposed Photographic Films." J. W. FOSTER.

WASHER.—No. 14,654. "An Improved Washing Device for Photographic Prints." J. S. SMITH.

FLASHLIGHT.—No. 14,700. "Improvements in Flashlight Apparatus for Use in Photography." J. SCHMIDT.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
3.....	Cripplegate Photo. Society	{ Demonstration: <i>The New Thornton Film.</i> W. D. Welford.
3.....	Southampton	Print Competition: Architecture.
4.....	Aintree	{ Demonstration: <i>The Lantern Slide and How to Make It.</i> G. H. Jackson.
4.....	Bootle	{ Demonstration: <i>Beginners' Faults and their Remedies.</i> G. H. Heathcott.
4.....	Gospel Oak	Prize Slides.
4.....	Hackney	Members' Open Night.
8.....	Borough Polytechnic	{ Excursion: Cashiobury Park. Leader, P. C. Cornford.
8.....	Brentford	{ Excursion: St. Albans. Leader, A. R. Read, jun.
8.....	Redhill and District	{ Excursion: Zoological Gardens. Leader, J. O. Grant.
8.....	South London	{ Excursion: Perry Vale. Leader, F. Goddard.

PHOTOGRAPHIC CLUB.

AUGUST 22.—Mr. F. A. Bridge in the chair.

Mr. George E. Brown was unanimously elected a member of the Club.

Mr. MACKIE, referring to the remarks he had made about the kachin developer at the last meeting, said that he had since found out that the solution he used was not made up according to the makers' instructions, and he thought that this was no doubt the reason of the slow action of the developer. At the same time he remarked that the formula given in No. 2101 of THE BRITISH JOURNAL OF PHOTOGRAPHY could not possibly be correct, as the B and C solutions given were identical, containing both one ounce of sodium carbonate to nine ounces of water.

The following question was found in the question-box: "How do you know when a negative is fixed?"

A lengthy discussion took place, in which nearly the whole meeting took part, and the combined wisdom of the members present eventually furnished the following reply:—

A plate may be considered properly fixed after it has been in the fixing bath as long again as it took to remove the last traces of white on the back of the plate. To fix a plate thoroughly means to allow a sodium thiosulphate solution to act on the silver bromide in the film until the latter solution has been completely transformed into the double thiosulphate of silver and sodium ($\text{Ag}_2\text{Na}_4(\text{S}_2\text{O}_3)_3 \cdot 2\text{H}_2\text{O}$). There are two distinct chemical actions taking place during the process. The silver is, first of all, transformed into silver sodium thiosulphate ($\text{AgNaS}_2\text{O}_3\text{H}_2\text{O}$), and this salt again combines with a further quantity of sodium thiosulphate to form the double salt above referred to. It takes twice the quantity of sodium thiosulphate to form the second salt as it takes to form the first; and if in conjunction with this fact one bears in mind that the first salt is opaque, while the second salt is only partially opaque, it may be safely assumed that the operation of fixing has been about half completed as soon as the negative has become quite transparent.

Mr. MACKIE remarked that a rough-and-ready way to find out whether a plate was properly fixed was to put one's tongue to it. The first salt formed being very sweet to the taste, its presence could be easily detected; and, if the negative had a sweet taste, it would be a sure sign that it was not yet sufficiently fixed.

Mr. FOXLEE said that, in dealing with the question as above, it must, of course, be assumed that a fresh fixing bath was being used, as the rule might not hold good with an exhausted bath. An exhausted fixing bath was, in his opinion a most dangerous compound, and he warned photographers not to be too economical in this respect, as doing so might mean "to spoil the ship for a ha'porth of tar."

North Middlesex Photographic Society.—August 20, Mr. J. C. S. Mummary in the chair.—Mr. H. W. BENNETT gave a lecture on

SILVER PRINTING AND TONING.

As this was one of the monthly instruction meetings, he confined his remarks to an elementary description of the best methods of getting prints on albumenised and gelatino-chloride papers, and the best toning baths to use. A red image on the paper as it comes from the frame is best, as it is more easily managed in the toning bath. For warm tones, albumen prints require to be printed for about twenty-five per cent. longer than it would take if stopped at the depth required when finished. Gelatino-chloride would take more, say fifty per cent. For purple tones the printing should be carried still further. He did not like the usually recommended sulphocyanide toning bath, as it was almost impossible to avoid double tones. He gave several others which answered for albumen and P.O.P. 1. Soda acetate, 24 grains; gold chlor. 1 grain; boiled water, 10 ounces. Mix 24 to 48 hours before using. 2. Borax, 80 grains; gold, 1 grain; water, boiling, 10 ounces. Add gold after cooling. This turns purple, but is then in best condition for toning. 3. Soda phosphate, 24 grains; gold, 1 grain; water, 20-30 ounces. Not for albumen. This tones quickly. Use the larger quantity of water for warm tones. The temperature should not exceed 60°-75° for albumen, 60° for P.O.P. A weak salt bath used after toning stops further action. Fix in hypo 3 ounces to print with 1 drachm ammon. 880, 12 to 15 minutes.

Redhill and District Camera Club.—On Saturday, August 18, the Redhill and District Camera Club had an excursion to Hampton Court. Starting from Redhill at midday by rail and cycle, the members on their arrival at the ancient Palace were conducted over the historic building by the Secretary of

the Club (Mr. F. H. Ellwood), who drew attention to the principal objects of interest. After roaming through the apartments and galleries, the members proceeded to take full advantage of the special permission which had been obtained to photograph the Palace within and without. A goodly number of plates were exposed, and, as it was a perfect day for photography, some good pictures should have been obtained. Whether any of the historic ghosts have appeared upon the members' negatives, we have not as yet heard.

FORTHCOMING EXHIBITIONS.

1900.	Sept. 21-Nov. 3	Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
October	1-Nov. 3 ...	Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
	, 17-20	Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.
November	7-10	Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
	, 12-17	Ashton-under-Lyne.
	, 21-23	Hackney Photographic Society.
	, 22-24	Hove Camera Club. Hon. Secretary, C. Berrington-Stoner, 24, Holland-road, Hove.

1901.
January 14-19

Blairgowrie and District Photographic Association.
The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

A SUGGESTION.

To the EDITORS.

GENTLEMEN,—Permit me to suggest, before we commence the year 1901, that there be a cyclopaedia compiled and published from and including the first year of your publication and that of this year 1900, somewhat similar to the cyclopaedia published in 1893 of the *Scientific American* journal, which is a summary under various headings of the most valuable articles in back numbers of the *Scientific American* journal, and saves all searching through the back numbers. I consider if such a cyclopaedia of THE BRITISH JOURNAL OF PHOTOGRAPHY were published, it would prove a most valuable work as far as photography is concerned, more particularly if it had a good index, and so save searching through back volumes for sometimes most valuable articles not to be found in any work. Many of the contributions might be omitted, as instance those recounting travels of photographers, many others much curtailed and the others compiled under separate heads, as, for instance, wet plate, dry plate, &c.; mechanical processes—collotype, zinc, copper, &c.; printing—albumen, gelatine, bromide, platinotype, carbon, &c.; mechanical printing processes, &c. There have been many processes since the first days of the JOURNAL, some little used now, why, I cannot imagine; some produced most beautiful results, and I even use them occasionally now; and some afforded great facility to an artist for colouring, and most beautiful results were obtained. I should say, if it were made known that such a cyclopaedia was about to be published, sufficient subscribers could be got as would cover all expenses of compiling and publication, so as to leave a certain profit for the volumes sold to non-subscribers. You may not think much of my suggestion, as I am only an amateur, but rather an aged one now (in my seventy-fifth year). However, my experience is rather long—from 1853, when I was working at the Daguerreotype before I left the old country to come to Australia. I am pretty well aware of, and can work, most of the photographic processes; in fact, I have strayed into paths not much frequented by amateurs, namely, the various photo-mechanical and printing processes, and not to be, perhaps you will consider, rather egotistical, those in the trade, not only the portrait men, but the mechanical men, have consulted me; in fact, the owner of one of the largest businesses in the Colony, and most successful as an engraver and lithographer and photographer in illustration by half-tone, &c., was induced through me to learn and go into the

business. He was only an ordinary seaman before the mast. He never had any instruction from a professional instructor. I hope you will take my suggestion into consideration.—I am, yours, &c., R. W. HOLMES.
20, Webster-street, Ballarat, Victoria, Australia, July 17, 1900.

[We are very pleased indeed to have a letter from a correspondent whose photographic experiences antedate even that remote historical occurrence, the foundation of THE BRITISH JOURNAL OF PHOTOGRAPHY in 1854. The suggestion he kindly makes shall be kept in view.—EDS.]

BRITISH AWARDS AT THE PARIS EXHIBITION.

To the Editors.

GENTLEMEN,—We have pleasure in advising you that our exhibit at the Paris Exhibition has received the highest award—the Grand Prix.

We take the opportunity of remarking that the great interest evoked by the introduction of the Panoram Kodak, No. 3 Folding Pocket Kodak, and, notably, by the ingenuity and efficiency of the little Brownie, must be of enormous benefit to the photographic trade generally. The latter camera alone has, beyond a doubt, added many thousands of amateurs to the photographic public.

If you will kindly give publicity to this communication in the columns of your esteemed publication, we shall be much obliged.—We are, yours, &c., KODAK, LIMITED.

43, Clerkenwell-road, London, E.C., August 20, 1900.

To the Editors.

GENTLEMEN,—We have been awarded two gold medals at the Paris Exhibition for cameras and microscopes; and the manager of our camera factory has also been awarded a silver medal.—We are, yours, &c., W. WATSON & Sons.

313, High Holborn, London, W.C., August 21, 1900.

To the Editors.

GENTLEMEN,—In an article headed "British Awards at the Paris Exhibition," which appears in your issue of August 24, it is stated that we have been awarded gold medals in Classes 12 and 15. This is not quite correct, our awards consisting of a gold medal in Class 12 and a Grand Prix in Class 16.—We are, yours, &c., ROSS LTD.

111, New Bond-street, London, W., August 24, 1900.

To the Editors.

GENTLEMEN,—We have pleasure in informing you we have been awarded a gold medal for our exhibit at the Paris Exhibition and a bronze medal for the Reliance Press which forms part of our exhibit.

Mr. W. Gamble has been awarded personally a gold medal as collaborateur and as editor of the *Process Year Book* and also of other photo-mechanical publications.

Our representative, Mr. Paul Neven, has also been awarded a silver medal for his services in the Exhibition.—We are, yours, &c., A. PENROSE & Co.

8 and 8a, Upper Baker-street, Lloyd-square, London W.C.
August 25, 1900.

To the Editors.

GENTLEMEN,—We notice that you stated in your last issue that we have been awarded a silver medal in the Paris Exhibition.

Our award was a "Grand Prix," as you will see by enclosed copy of a letter from our agents in Paris, confirmed by two further letters of inquiry.—We are, yours, &c., W. J. BYRNE & Co.

Richmond, Surrey, August 27, 1900.

[We are much obliged to those firms who have advised us of the awards that have been made to them at Paris. As we stated in our last week's article, a correct list was not available through the ordinary channels of information. The public has had to rely on newspaper reports or the advices of exhibitors for intelligence as to the destination of awards. To most minds it might appear that one of the functions of the British Commission would be to procure at the earliest possible moment a list of awards to exhibitors from the United Kingdom, and give it the utmost publicity.—EDS.]

THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—I notice in the Answers to Correspondents in your issue for August 24 one to Colonel Gubbins on the metric system. I fear your note will not help him much, and hope that you will allow me to amplify it.

Colonel Gubbins appears to have noted that to the metric formulae he quotes the proportion of the sodium sulphite in the adurol is 8 : 1, and

remarks that it is not the same in the two versions of the formula given; in this he is quite correct, but a reference to preliminary remarks on p. 1018 of your ALMANAC will show him that, when the publishers of formulae give their own versions of equivalent values, they have been adopted; that has been done here. The people who supply these data use round numbers, and apparently have considered that the approximations given are sufficient for practical purposes, though a nearer approach might be given to the metric formula. That is the simple solution of his difficulty, either proportion will be sufficiently accurate, as is manifest to any one who considers the parts which the two chemicals play in the development.

Allow me, however, to express my dissent from the last part of your reply: Colonel Gubbins will, I think, do better to have separate measures for the English and metric systems, and adopt one or the other entirely. I am aware that you have stated that you have marked your metric weights with their equivalents in English weights, and made them useful for both purposes; but I think most people will agree with me that to make up most English formulae by the metric weights would involve a troublesome arithmetical calculation, and be a fertile source of errors; that too, would I believe be also, though to a less extent, the result of using measures divided both for English and metric units. Any one who makes up solutions by the two sets of formulae will soon find out the greater simplicity of those on the metric system in use.—I am, yours, &c., J. F. T.

ELEVENTH INTERNATIONAL EXHIBITION, CALCUTTA.

To the Editors.

GENTLEMEN,—With reference to my letter of 18th ulto. I have pleasure in furnishing you with complete details regarding the arrangement made by the Society for dispatch to Calcutta of the photographs of intending Exhibitors.

Mr. C. H. Coates, late Treasurer of the Society, at present on furlough, will receive any photographs that may be sent to him, c/o. Messrs. W. J. Keymer & Co., 60 Fenchurch-street, London, E.C.

These will then be packed and dispatched by him to Calcutta on October 31. Pictures must be delivered at this address, free of cost to the Society, who, however, bear all charges for freight to and from India.

Competitors may, of course, send their exhibits direct if they prefer to do so. They should be dispatched not later than November 15.

If you will kindly draw attention to these points in your esteemed JOURNAL, I shall be greatly obliged.—I am, yours, &c.,

T. C. DOWNING, Honorary Exhibition Secretary.
Photographic Society of India, Club and Dark Rooms,
57 Park-street, Calcutta.

KACHIN.—A CORRECTION.

To the Editors.

GENTLEMEN,—In my article on Kachin, which appeared in your issue of the 10th inst., are two typographic errors in the 10 per cent. solutions, page 502, which kindly allow me to correct. In solution C, instead of sodium carbonate, read sodium sulphite; and, nine lines below, for sulphate read sulphite.—I am yours &c.,

E. W. FOXLEE.

Acton, W.

THE TANQUERAY FRAUDS.

To the Editors.

GENTLEMEN,—In to-day's issue of the *Daily Mail* the Tanqueray fraud is again exposed.

If photographers in every town throughout the country would cut out that paragraph and place it in a conspicuous position in their windows or show-cases, I venture to think the "Société Artistique de Portraits" would soon "find their occupation gone."—I am, yours, &c.,

Leicester, August 24, 1900.

HENRY M. WARD.

AN OFFER.

To the Editors.

GENTLEMEN,—I am fairly well advanced in portrait painting, but desire a few lessons in life-size work, and am willing to offer the hospitality of my house and board (piano, &c.) free for a fortnight in return for about an hour's lesson a day. I may say Dolgelly is a favourite holiday resort, being near sea, &c. Every effort will be made to make holiday most enjoyable. Not knowing an oil artist, I should be much obliged for your kind suggestion to obtain same. Thanking you in anticipation, I am, yours, &c.,

A. HAWKINS.

Dolgelly, August 25, 1900.

[Some reader, having the necessary ability and the desire for a seaside holiday, will probably communicate with our correspondent. Failing an advertisement, this is the only suggestion we can offer.—EDS.]

ABOLISHING THE DARK ROOM.

To the Editors.

GENTLEMEN.—In your BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900 is an article by Mr. E. Howard Farmer, on "Abolishing the dark room," p. 803, in which he appears to refer, for an account of the light filters used, to a communication to the Royal Photographic Society, May 1898. As I should like to repeat his experiments, could you inform me where I can get a copy of the information re filtering material?

I have devised an apparatus for determining the density of negatives, which I find very useful in all printing processes, saving a great waste of time and paper. If you consider it worth a place in your next PHOTOGRAPHIC ALMANAC, I enclose an account of the apparatus, which you are at liberty to make any use of you may think fit.—I am, yours, &c.,

Wanganui, New Zealand.

C. W. BABBAGE.

[A copy of the *Journal* of the Royal Photographic Society, containing Mr. Farmer's first paper, can be obtained of the Secretary of the Society, 66 Russell-square, London, price 1s., plus postage. The interesting communication sent us by our correspondent will appear in our forthcoming ALMANAC.—EDS.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

C. A. Walker, 176, Upper-street, Islington, N.—Photograph of L. W. Pursey.

J. Mack, Alexander-terrace, Coleraine, Co. Derry.—Two photographs of Sir G. S. White.

T. W. Calcutt, 21, Castle-street, Hill Top, West Bromwich.—Photograph of two old folks in a donkey cart.

A. Burchardt, Brashfield, Bicester.—Photograph of Lieutenant F. Tait, Mr. E. Blackwell, and T. Morris.

T. McKey & Son, 62, Hill-street, Newry, Co. Down.—Photograph of group of the Newry Roman Catholic boys' brigade.

N. N.—Send us your name and address, and we will answer your question. As a reader of the JOURNAL, you should be aware of the rule you are breaking.

OVER-EXPOSURE OR FOG?—TROUBLED (Bradford). The negatives sent do not exhibit signs of over-exposure. They are slightly veiled, it is true, and this might be due to too-prolonged development. The plates do not appear to be faulty.

ARISTOTYPE PAPER.—PAPER writes: "Where can I get the American Aristotype paper in England? I am under the impression that there is an agent in England."—In reply: Write Messrs. O. Sichel & Co., 52, Bunhill-row, E.C.; they may be able to supply you.

ADDRESS WANTED.—G. THOMAS DAVIES writes: "Referring to the first paragraph in the second column of p. 500 of the JOURNAL, I should be grateful to know the address of the firm, or a firm, from whom I can obtain the prints."—From Franz Hanfstaengl, 16, Pall Mall East, or through any print-sellers.

PURATYLENE.—ACETYLENE writes: "As a user of acetylene, I should esteem it a great favour if you would give in your next issue the address of the Gold & Silver Company, where the puratylene mentioned by your correspondent, Mr. R. J. Moss, may be obtained."—In reply: Better address Mr. Moss, at 97, Great Hampton-street, Birmingham. We have, this week, no means of directly ascertaining the address for you.

FELLOWSHIP OF THE R.P.S.—S. FINNEY writes: "1. How can one obtain an F.R.P.S.? 2. In what subjects would one have to pass? 3. What fees are required? 4. Also, would one have to reside in London to study for same?"—In reply: 1. By election at the hands of the Council of the Society. 2. There is no examination, but a candidate's qualifications are examined by a Fellowship Admissions Committee. 3. None; but the subscription of a Fellow is 2*l.* 2*s.* per annum. 4. No.

STUDIO DESIGN.—COSMO. As the studio has to be built close to the wall of the house, there would be no advantage whatever in having the ridge roof; indeed, it would be a disadvantage. Therefore have the lean-to form shown in sketch B. The position is admirable, as you will have a direct north light, and be shielded from the sun, so that a simple system of blinds will suffice. If, in such a studio, you do not get as good portraits as ever were taken, it will be your fault, and not that of the studio.

A COPYRIGHT QUESTION.—T. KING writes: "A few months ago I sold a view of our church to a local grocer. When I did so, he told me he wanted it for a traveller. I thought it was some one interested in the place, who would like to have a photograph of it; now it turns out he has used it for the decoration of china of various firms. Can I do anything in it? I do not see why he should be allowed to use my photographs for such a purpose without my permission."—In reply: You can proceed, and recover for infringement of copyright—we presume the photograph is registered.

THE "PHOTO-MINIATURE."—PHOTO writes: "I should esteem it a favour if you would inform me concerning the *Photo-Miniature*, so favourably reviewed by "Cosmos" in your issue of August 17, p. 518. 1. Whether it is a regular periodical, or a series of small handbooks that may be obtained in individual numbers. 2. The price per issue or number. 3. The publisher or agent in this country."—In reply: 1. It is a monthly publication, each number being devoted to the treatment of a separate subject. 2. Twenty-five cents, say, one shilling. 3. Dawbarn & Ward, Farringdon-avenue, London, E.C.

PHOTOGRAPHY IN SOUTH AFRICA.—L. T. C. L. writes: "Two young men, professional photographers, are thinking of going to South Africa when the war is over with a view of travelling through Cape Colony and practising outdoor photography. Will you kindly give your opinion as to the wisdom of the undertaking?"—In reply: A matter upon which it is obviously difficult for us to advise. Between the years 1881-99 we had personal knowledge of South African photographers who were prospering. So far as we are in a position to form an opinion, our correspondents might do worse than put their intention into execution.

P.O.P. TROUBLES.—F. WILSON writes: "I am using a good make of gelatine P.O.P., but prints on drying have a dead dull surface, unlike a gelatine paper; this has only been so a few weeks. The makers say that the hot weather may be the cause, as it has given them trouble in the manufacture of the paper. I use the sulphocyanide bath, and alum after fixing."—As the makers say that the trouble is due to the hot weather, we have no doubt it is. The only suggestion we can make is to procure some paper made since the weather has been cooler. Excessively hot weather causes a great deal of trouble to workers with gelatine.

STUDIO-BUILDING.—JOHN E. EDWARDS writes: "I am about to commence business as a photographer, and should esteem it a great favour if you would kindly give me some information concerning the erection of a suitable studio. My intention is to build a studio (a lean-to), say, thirty feet in length and about fifteen feet wide. Will you kindly inform me how high the building should be on the light side, what degree should be the slope of the roof, and how many feet across the roof ought to be glazed?"—If the height to the eaves be made about seven feet six inches, and to the top about twelve or thirteen feet, the slope will be very suitable. Have about five feet six or a little more at either end, top and sides opaque, and the rest may be glass.

ALBUMENISED PAPER.—M. N. MOSDIKHIAN, of Cesarea, Asia Minor, writes: "The JOURNAL is my best delight—I cannot get on without it; many thanks also for the phototype copy of the members of the Photographic Convention. Will you be, sir, so kind as to give me the best way of sensitising albumenised paper, and the best toning formula for the same to obtain good violets on prints?"—Float the paper on a sixty-grain solution of nitrate of silver for from two to three minutes. The following bath will give deep tones: Chloride of gold, 1 grain; phosphate of soda, 20 grains; water, 8 ounces. Other formulae will be found on p. 1080 of the ALMANAC. It should be borne in mind that the tones of the print depend as much, or more, on the character of the negatives as they do upon the constituents of the toning bath.

COPPER DEVELOPING TANK FOR CARBON PRINTS; LENS APERTURES.—W. J. BARBER writes: "I am about having a new developing tank made for carbon prints, and would like to have it in copper; would you kindly say whether bich. potash would have any injurious effect on that metal? Or would it be advisable to have the tank in tin-plate, as usual? 2. Also, I have recently had a new set of stops supplied to a portrait lens by Suter, and he has numbered same according to uniform system of this country, i.e., Nos. 2, 4, 16, &c., but the largest aperture is marked 0·65. Kindly say the value of the latter stop. I presume it is somewhere about f-3 $\frac{1}{2}$.—1. Copper will do very well, and will be far more durable than the usual tin or zinc vessels. 2. Ascertain the focal length of the lens and divide it by the aperture of the largest stop, and that will give you the f value.

HOME PREPARATION OF DRY PLATES.—DRY PLATE writes: "I have occasion to use nearly three gross of plates weekly. 1. Could I by following any really good formula reasonably expect to be successful in making my own dry plates, coating same separately as with wet plates? 2. With some little care and brains you think I might succeed, would you be good enough to recommend a formula, or the best book on emulsion?"—In reply: We cannot recommend our correspondent to take up the home preparation of gelatine dry plates. The difficulties in the process are not great, but uniformity of quality is difficult to secure in a succession of small batches. At one time many photographers, amateur and professional, made their own plates, but the commercial articles were much dearer than they are now and not so good. "Dry Plate" had best leave well alone, we think.

SPOTS ON PRINTS.—W. SLADE writes: "I should feel very grateful if you could inform me the probable cause of the spots on two enclosed prints. They turn up every week. For two years I've tried all means to avoid them, but cannot. Are some of them in the paper, so cannot be avoided? I am using at present Otto P.O.P., and my proper studio camera. Lately, sharply focussed subjects have turned out of focus, and I am at a loss to know where the defect lies. I am using my outdoor camera at present, and get every negative sharp by it, so there is something wrong."—1. The spots appear to be due to particles of something that has come into contact with the paper while it is wet. Particles of iron in the washing waters, prior to toning, would produce similar spots. 2. It is obvious that the plane of the focussing glass does not coincide with that of the plate. The two require adjusting. If you cannot do that yourself, you had better send the camera to its maker.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

THE fortieth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1516 pages, and, as was the case in 1899, the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1901. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

In the Notes and News of the Camera Club *Journal* for September there are some items of information relating to well-known photographers which may be of general interest. One of the oldest members of the Club, a contributor of papers to the now abolished Conferences, Mr. H. H. O'Farrell, is back again in England, enjoying leave from his official duties in India. Baron Meyer Watson, who, with the Baroness, has been paying a visit to Sir Claude Macdonald at Pekin, left the city before the investment actually commenced, and is now understood to be in Japan. Colonel Holbeche has been promoted to be a Knight of Grace of the Order of St. John of Jerusalem. Amongst the forthcoming lectures to be delivered at the Club will be one by Mr. H. C. Shelley, the war correspondent of the *King* and the *Westminster Gazette*. The subject will be "War

on the Veldt," and it will be illustrated by slides made from the author's negatives. Mr. Shelley's lecture will probably pack the Club meeting-room to the limits of its seating and standing capacity. The number of the Club *Journal* from which we are quoting is full of exceptionally interesting articles and papers. Mr. A. C. Beard describes, in a chatty manner, life on board a battleship during the Naval Manceuvres. "The Autocar of To-day," by Mr. Henry Sturmey, is a topic of universal interest at the present time. Professor Cecil Bendall, M.A., supplies some notes of a recent tour in India and Nepal; Japan is dealt with by Mr. J. W. Groves, F.L.S.; and "Sixty Years of Frontier Warfare," by Major A. C. Yate, I.S.C., is another interesting paper. "The Siege of Kimberley," by Mr. G. M. C. Luard, M.A., one of Reuter's correspondents, concludes a singularly varied and readable number.

* * *

Of their *Anglo-Saxon Guide to the Paris Exhibition*, Messrs. Boot & Son, Limited, of 24, Old Bailey, E.C., are issuing a second edition. It is prefaced by a complete list of the British awards, and thus it is worth preserving for future reference. Running to some 240 pages, the book is really an admirable guide to the Exhibition and the sights of Paris, fully illustrated, and written throughout in an easy colloquial style which makes it pleasant reading. One of the special articles, of which there are a considerable number, treats of the attractions of Paris from a photographic point of view. This tells the would-be photographer what to take and when to take it, and supplies him with many other hints that are likely to be of service. The writer of the article remarks: "As a rule, the photographer will not find his movements impeded in France so long as he steers clear of fortifications. But he will always be well advised to carry a passport as a constant companion to his apparatus, especially in country districts, where the gendarme is apt to be particularly inquisitive directly he espies a camera. In Paris the guardians of the 'public safety' have more modern ways, and comparative, if not absolute, freedom exists—any how, as far as the taking of photographs is concerned." It is to be feared that, during the remaining two months the Exhibition will be open, very few people from these islands will visit it; but those who do so may be recommended to provide themselves with a copy of Messrs. Boot's book. The official guide, of which we bought a copy when in Paris, is a dry and uninforming compilation, which may have its uses as telling one what the main features of the Exhibition consist of, but is in no sense a proper guide. It synopsises and does not direct. Messrs. Boot's guide is published at a shilling, and it is well worth it.

* * *

THE officers of the South London Photographic Society have so assiduously cultivated the art of organizing photographic tours that everything of the kind they undertake turns out a success. Whether it be to Ireland or to an English cathedral town, large parties are always catered for on very low terms, and the opportunities for interesting photography which these excursions supply are fully availed of by the satisfied tourists. One of the South London's principal excursions this year has been to the Rhine Valley and Ahrgau, and a short account of it appears in another part of the *JOURNAL* this week. The work of organization fell on the capable shoulders of Mr. W. F. Slater, whom we here invest with the style and title of the photographic tourist's own Thomas Cook, and his party reached

the very handsome number of fifty-four. The excursion was so successful that a desire has been expressed for its early repetition. Mr. Slater writes from 5, Firs-parade, High-road, Lee, S.E.: "By special desire of some friends who would like to make the trip, I have decided to repeat the programme on Saturday, September 22, arriving back in London Monday, October 1, if I can get a party of at least thirty, at the inclusive charge of 5*l.* 10*s.* This, taking place in the vintage season, will have the additional attraction. Those desiring to join this excursion must let me know by return, with the sum of 3*l.* towards travelling expenses." We have much pleasure in giving publicity to the foregoing particulars, and we hope Mr. Slater will be so well supported in the second excursion that it will be in every way as successful as the first.

* * *

IN the early part of the year Mr. E. Sanger Shepherd delivered, at the Society of Arts, a series of four Cantor lectures on the "Photography of Colour." The first of the lectures is printed in the Society's *Journal* of last Friday, August 31 and the remaining three, it may be presumed, will be published in the three succeeding issues. We draw attention to these lectures in order that those interested in the subject may have the opportunity of procuring them. The *Journal of the Society of Arts* is published by Messrs. George Bell & Sons, York-street, Covent Garden, London, at 6*d.* weekly. The scope of the series of lectures is indicated by Mr. Sanger Shepherd's introductory remarks: "I propose to recall to you the principal facts of our knowledge of light and colour, laying special stress upon such points as we shall require to aid us further on, and then to describe to you how lights and shadows are measured, for we must remember that, however well we may understand the theory of a photographic process, it is only when we reduce that theory to actual practice in accordance with accurate measurement that we can hope to obtain perfect results. In the second lecture," he adds, "I shall show you how to correctly represent a coloured object as a monochrome print, work usually spoken of as orthochromatic or isochromatic photography. In the third lecture I shall show you a number of lantern slides in natural colours, explaining how they are made, and the final lecture will be devoted to colour photography in relation to the printing press." To the first lecture, which deals with many of the phenomena of light, sound, and colour, there are twenty-two illustrations.

* * *

BY an advertisement in one of the popular monthly magazines we note that the Artistic Photographic Company, of 90, and 92, Oxford-street, London, are offering the public phototypic engravings of modern paintings by such artists as P. R. Morris, A.R.A., and J. C. Hook, R.A. The engravings are on plate-paper, measuring 25 x 20 inches, and they are sold at 2*s.* 6*d.* each. We have not seen a specimen print, but the idea is good, and in our opinion a money-making one, especially if the engravings are in half-tone. We wish we could extend our commendation to another part of the same advertisement—it appears in *Cassell's Magazine* for September—in which five-and-sixpenny bromide enlargements are offered, with the inducing statement that "one guinea and upwards is usually charged" for them. In an earlier advertisement which appeared in a daily paper a few weeks ago, the Company say that "ordinary photographers charge from one to two guineas" for similar 12 x 10 bromide enlargements. The Artistic Photo-

graphic Company know better, of course, and we are surprised at their continued disingenuousness in the matter, but that frolicsome publication, the *Sporting Times*, or the "Pink 'Un," is committing a similar sin in sheer ignorance, no doubt. This blushing print, to whose witty columns we are indebted for many a hearty laugh, has followed in the wake of hundreds of its contemporaries, and succumbed to the cheap enlargement device. Six-and-sixpenny enlarged portraits in bromide are offered to its readers, and the paper incurs the responsibility of the statement that they are worth 2*l.* 2*s.*, the inference being that this sum is what a professional photographer usually charges for productions of the kind. These cheap enlargement schemes are legitimate enough in their way, but it is to be regretted that they are not conducted with a closer regard for fairness. "Ordinary photographers" are not the cormorants they are inferentially called. Mr. John Corlett, the editor and proprietor of the "Pink 'Un," is a fair-minded sportsman, who, we are sure, would not wish his columns to be used for statements reflecting on an honourable profession like photography, and we hope to see that he has given directions for the withdrawal of the "Two Guinea" fiction from the advertisements of the enlargements he is offering his large circle of readers.

EXPRESSION IN PORTRAITURE.

It has been well and truly stated that facial expression is governed by the inner workings of the mind, and there are but few photographers, who make a special study of portraiture, who do not know the immense importance attaching to the rendering of pleasing and natural expressions in the faces of their sitters. To many this may appear a simple and easy matter, but the fact is, it is one of the most difficult things a portrait photographer has to cope with, and, in numberless cases, the most exquisitely executed photographs fail to give satisfaction, by reason that some particular expression, which may almost be termed "one's individuality," is not strongly apparent in the picture. That sitters themselves are responsible for many of these so-called failures is beyond all doubt, for the number of people presenting themselves to be photographed who lose their individuality in expression the moment they enter a studio, is much greater than many imagine. Then, again, it is quite surprising how some sitters are influenced towards liking and disliking the expression in their pictures by the strictures they hear passed upon the photograph on the part of their friends, for rarely indeed will two individuals be found who think alike on such a matter. One will say, "Oh, it is a good and speaking likeness;" while another will declare, "No, I don't like that, it is not your expression at all;" and the poor photographer is censured, of course. Or, very probably, some amateur friend, who, of course, knows so much about photography, will be asked his opinion, and, notwithstanding that he never took a studio portrait in his life, will, out of the depths of his knowledge, charitably condemn the production on the score of expression, and possibly faulty retouching. If sitters, and their friends who so lightly pass censure on the photographs they examine, would only realise the fact that so much depends upon the sitters themselves in the matter of expression when being photographed, how much better would it be for the poor photographer and themselves also! Yet no, somehow the public have come to expect so much from a photographer, that he is called upon to make crooked noses

straight, plain people to look pretty, and to cover up numberless failings.

No doubt, on the other hand, as is quite well known, a clever photographer, by following out certain well-recognised rules and resorting to numerous subterfuges, can do something towards covering up defects on the part of his sitters' appearance: but, generally, his power in this respect is limited, and, more often than anything else, consists of carefully posing those who require special treatment of this kind. Strive as he may to conjure up natural and pleasing expressions on the faces of some sitters, he is met by sheer failure, simply by reason of the fact "that from some cause or other beyond his ken the inner workings of the mind on the part of the sitter are such as to make it impossible for him to yield a pleasing and natural expression." That there are very many individuals thoroughly sensible to the importance which attaches to themselves in this respect when being photographed is, fortunately, quite true, for now and again we do meet with those who exclaim, "No, I won't go to-day, the market has gone against me in pigs." Or perhaps it may be Miss So-and-So has seen her best young man in company with her hated rival on her way to the studio, and at once changes her mind by resolving, "Not to-day. I could not look happy if I tried." It is such little incidents as these that militate against success in portraiture to an extent those outside the sphere of studio work have no conception of. Expression in portraiture does not mean a silly, inane giggle, or even a forced laugh, such as sitters are wont to put on at command. This is purely artificial or spurious, and, no matter how desirous he or she may be to yield a pleasing or natural expression, unless it is governed entirely by the inner workings of the mind, the will is powerless to produce it.

It has been said that much may be done in posing to make or mar a picture. This can be strikingly exemplified by any one who cares to go to the trouble of carrying out a few well-recognised rules in posing, and, when a good model is provided, much may be learned from this alone, i.e., without any need of exposing sensitive plates, for the model's appearance in varying positions will be at once apparent and highly instructive. Perhaps no more striking examples of the wide range in appearance capable of being introduced in a picture are to be found anywhere than those from the pen of E. K. Hough, written many years ago. These instructions should be read by all photographers who aspire to the production of good work in portraiture. In the numerous examples given this clever writer shows, by merely altering the position of the head and body to that of the camera, how a very wide range of contrasts are produced, such as, when the body, head, and eyes are in a certain position to the camera, the pose can be made to yield an easy, animated appearance, and then, by slightly altering it, a greater amount of activity and interest is introduced. Then, again, other positions are described, in which the model is caused to yield an absorbed or deeply interested appearance, verging into anxiety, surprise, or other similar emotions, according to the face and action of the sitter, or again, by slightly altering the position of the eyes to the head and body, an uneasy, insecure, jealous, watching appearance is unpleasantly introduced. Then, again, positions are described which yield an easy, direct, sincere, manly attention, and these, in turn, by further changing the position of the sitter, give place to shyness, coquetry, suspicion, according to facial action; and finally, by altering the position of the head and eyes upwards, an appearance of adoration, spiritual contemplation,

tion, or supplication is introduced, according to the other accompaniments, while, by further changes still, it is easy to yield a cowardly, shrinking, or sinister, watching appearance of suppressed anger. As stated, it is not necessary that a student in photography should resort to the exposure of sensitive plates to see how these results are achieved, although a series of photographs taken under different conditions are undoubtedly highly valuable, and prove instructive, when special effects are desired in a picture. Much of this sort of thing is noticeable in some of the works of our great painters, and is traceable also in sketches by clever artists, and it is quite surprising what effects can be produced by closely studying the art of posing.

It has been well said that there never was a face which could be deemed absolutely expressionless; but, on the contrary, there is always present some pervading individuality of character, and it is therefore the photographer's duty to carefully study these peculiarities, and then, by the most effectual method of posing, endeavour to portray the likeness. To do this satisfactorily, not only must attention be bestowed upon posing, but the utmost care observed in so lighting the sitter that the most satisfactory results are obtained. The subject of lighting is one of great importance in portraiture, perhaps quite as much so as that of posing and the yielding of expression. It will be found also that a very large number of people recognise the truth of the saying, "that every individual has a best side of his face," i.e., one side looks better than the other. Of course, a clever photographer will know how to satisfy his clients in this respect. Noses also are seldom or never found straight, and what in vulgar parlance is termed squinting all come in for special treatment at the photographer's hand.

Toning and Purple Tones.—Mr. H. W. Bennett, in a recent lecture on printing and toning, gave several formulae for toning baths. The lecture reminds us that we have recently had many queries to reply to as to how to obtain rich purple tones on silver prints, and the formula for toning baths for the purpose. Now, we do not know if a reaction is setting in against the brown tones that have been so prevalent during the past few years or not, but we perceive that many desire purple ones just now. For years past we have pointed out that the colour of prints is more dependent upon the character of the negative than the toning bath employed. Let us quote an example. The acetate bath is said to be specially adapted for red-brown tones, and our older readers will remember the *furore* that was created here in the sixties by the famous pictures of the late Adam Solomon, which were all of a deep, rich, purple-black, yet all those pictures were all toned in the acetate bath. Some time ago we had the opportunity of seeing several of Mr. Solomon's negatives, and, although they were taken when vigorous wet-collodion negatives were in vogue, we never saw more vigorous ones than these. The deepest shadows were literally clear glass, while the highest lights were, practically, quite opaque. With such negatives any tone is obtainable from red brown to black on albumen paper; but that is not the case with the comparatively thin gelatine ones. The albumen paper used for these pictures was not the highly glazed paper of the present day, but one with the old surface. It may be mentioned that the higher the gloss on albumen paper the greater is the difficulty of getting deep purple black tones upon it. These tones are almost, if not quite, impossible on the highly glazed gelatine papers of to-day, whatever negative or toning bath be employed. With some collodion papers and the sulphocyanide bath, with very vigorous negatives, almost a blue black is obtainable; indeed, nearly the whole of the silver forming the image can be replaced by gold without staining the paper. If we want the rich purple blacks of the days of old, we must fulfil the conditions then prevailing.

Are there too many Photographic Societies?—At first sight it might be thought that, for the advantage of photography, there could not be too many societies; but, on the other hand, it may be argued that fewer would be more advantageous, provided they were well attended, for one strong society is, in every way, better than half a dozen petty ones, and these, it seems, are gradually increasing in different neighbourhoods. One or two in a large provincial town are all that is required, and where that number only exists they are usually in a flourishing condition, but where there is a plethora of them they are generally weak in the number of members and the work they do. Therefore, as we have said on former occasions, one good society in a district is quite sufficient. We allude to this matter once more, for we are told that an attempt is being made to form a photographic society or club at Shepherd's Bush. One would have thought that this suburb was fairly well supplied with societies, seeing that it already has four well within a radius of three miles, the Ealing, the Brentford, the West London, and the Chiswick, this being a split off from the West London. It might also be mentioned that the Richmond Camera Club is but a couple of miles from Brentford. In small societies petty jealousies too frequently arise, internal dissensions follow, and sometimes a split. A correspondent sends us, as an example, a local paper, in which nearly a column of it is taken up by letters with reference to the Brentford Society, in which the terms "cliqueism," "pot-hunting," "fresh blood wanted," &c., figure, yet this Society is only three or four years old. Now, many will think that, if all these four Societies and the proposed fifth were to combine and meet at some central place, it would be to their mutual advantage. Those who have novelties to bring before the photographic world, or new processes to describe, do not care to do so before little societies, with only a dozen or two members, the majority of whom do not attend the meetings.

When is a Negative Properly Fixed?—The other night at the Photographic Club the question was asked, "How do you know when a negative is fixed?" This is a very simple question to put, but it is one that is not so easy to answer. The consensus of opinion of the members present was that if the negative were left in the fixing bath for as long again as it took to remove the last visible traces of the bromide, as seen from the back of the plate, it might be considered properly fixed. So it may be; but that scarcely answers the query, which was, how do you *know*? Assumption is not knowledge, and, strictly speaking, the question was not answered. However, it may fairly be assumed that, when a plate is left in the hypo solution for the same time as it took to remove the last traces of the bromide, it is really fixed. But too often the plates are taken out as soon as, or a little after, the last traces of the bromide have disappeared, with the result that the negatives frequently become stained when printed from, particularly if the paper happens to be a little damp, also if they have to be afterwards intensified. As we have said on many previous occasions, unless negatives and prints are properly fixed in the first instance, no amount of after-washing will eliminate the hypo salts, hence staining troubles. We would suggest that, when a negative is of special value, or it has to be dealt with afterwards in the way of intensification, if the fixing bath has been in use for many negatives, it should be put for five minutes or so in a fresh solution of hypo. This, though it may not be actually a necessity, is a precaution. It involves but little extra trouble, and hypo is cheap, though it is often unwisely economised.

Photographic Evidence.—From time to time we have chronicled the novel purposes to which photography has been put in legal matters. One of the latest was in connexion with proceedings under the Smoke Abatement Act, where photographs were shown of the chimneys caught in the act of offending. Last week we see by a newspaper report that, in the case of a doctor charged with cruelty to a lunatic brother, photography had been utilised by the defence as regards the evidence of a neighbour who said she had watched the doctor from her garden. Here is an extract: "By her consent two

photographs were taken at the exact spot where she was standing, and at the height of her eyes. The photographs only succeeded in showing the top of the doctor's hat as he stood in the enclosure." In the same issue of the paper is an account of a bullock escaping and going up the stairs and into a bedroom of an inn at Bedford, and, like the proverbial "bull in a china shop," doing much damage. When the animal retired the room, it is said, was photographed. Possibly this photograph may be utilised to show the damage the innkeeper sustained by the intruder. The photographs in both these cases, in the circumstances under which they were taken, might be open to challenge.

Incongruous Photographs.—The glaring incongruities that may often be seen in albums of old portraits are not so prevalent now as formerly. Yet they are often to be met with. We recently noticed in a suburban show-case (within five miles of the Marble Arch) a very pretentious display of portraits, which highly amused us. For example, there were ladies, gentlemen, and groups leaning on a rustic fence with an elaborately painted background of an interior, apparently a drawing-room, and others posed against an imitation stone balustrade with the same background; but perhaps the most amusing pictures of all were those of a volunteer in khaki, kneeling with his rifle as if he were going to "pot" a Boer, the same drawing-room background being shown. Now, amusing as these incongruous photographs are to the general public, they are not more so in the eyes of artists than many of those of the mud-flat type that have been shown, with their wiped-out patches, to represent impossible lights and their equally impossible skies. Yet such pictures have been highly eulogised by those who our American cousins have recently christened the "godlings" of "art photography." But, as intelligence increases, we hope to see fewer of these glaring incongruities, alike in portraiture and in so-called "artistic photography."

A New Lens.—At a meeting of the Deutschen Photographen-Vereines, in Berlin, on the 3rd ult., Dr. Holm, scientific adviser to the well-known optician, C. P. Goerz, described a new lens manufactured by this firm, which is called the Hypergon Double Anastigmat, and the following *précis* of the description may be interesting: The lens is symmetrical, and absolutely corrected for astigmatism and distortion, and angle included = 140° , or, if it be assumed that some of the rays are cut off by the mounting, it includes at least 135° . The diameter of the field of view, or, in other words, the diagonal of the plate covered, is five times the focus, or the longest side of the plate is almost four times the focus, for a lens of 90 mm. focus will cover a plate 30×34 cm., and the diagonal of this is 45 cm. In all wide-angle lenses up to the present, in the most favourable cases the longest side of the plate has been about double the focus. On account of the peculiar construction of this lens, it is impossible to correct spherical and chromatic aberrations, but this will not be of much moment in practice, as the spherical aberration can be cured by stopping down, and the chromatic aberration is obviated by shifting the lens after focussing and before exposure. The lens is provided with only two diaphragms, $f\cdot20$ and $f\cdot30$. If $f\cdot20$ is used for focussing, and it is considered desirable to expose with this aperture, the lens must be shifted nearer the plate, but when $f\cdot30$ is used for focussing and exposure, this is unnecessary, as at this aperture both the spherical and chromatic aberrations are obviated. It is claimed that the Hypergon Double Anastigmat, on account of the lenses being constructed of white and very transparent glass, is very rapid. As is well known, with all wide-angle lenses there is a considerable falling off of illumination towards the edges of the plate, and this it is proposed to obviate by the introduction of a "star" stop, which will equalise the illumination of the plate.

THE PHOTOGRAPHER'S YEAR.

SEPTEMBER.

SEPTEMBER in many respects is a delightful photographer's month, in others a disappointing one. Getting well into autumn, it is a time more for men over, than under, fifty. A young man may appreciate the beauties of the season, but he does not feel them like he who is himself

approaching the "sere and yellow leaf" of life. The deeper, apt suggestion is unfelt in the one case, whereas it is in the other. The weather as a rule is as near perfect as it can be. The heat of summer that many find oppressive, and most carrying a camera would like a little less of, has passed away. On the other hand, it is yet too early for any suggestion of coming cold and frost. It is also a calm month, a consideration where foliage enters into the picture. So far so good. It is when we look at the masses of varying colour in the foliage, and realise the powerlessness of photography to render them, that the feeling of disappointment comes in. Orthochromatic plates and colour screens are very valuable and desirable towards the correct translation of colour into shade, but it does seem a pity not to be able to turn these gorgeous yellows and rich browns into anything better than degrees of black. The many workers in the direction of reproducing colour should spend as much time as possible in the woods in September, in the hope of catching something of inspiration towards the solution of the problem they have in mind and at heart; or, if inspiration in these matter-of-fact, scientific, and prosaic latter days be out of the question, the regret at having to leave so much unrecorded may stir the brain into brisker and more sympathetic action to good effect. Autumnal tints, too, would give colour photography its most artistic field, in that they are laid on in such broad masses. There is nothing finnickin' about nature in the autumn. She spreads her colours with a lavish hand. Making the best we can of what we have got, the same broad display of colour, expressed even in black and white, can give highly artistic effects. The lengthening of shadows and lowering of light helps to the same end.

This is the time of the year for impressionist pictures. That is, the true impressionism of broad masses, low, but workable, light, and mist to blot out excess of detail. There is no need now to slop about flat estuaries with their mudbanks and creeks in the evening for the necessary conditions. Any town possessing a castle, or with a river running through it, has an ample supply of subjects for all the artistic impressionists living in it. Most fortunate of all, although it is in a very minor measure that he is aware of the fact, the Londoner has the Thames. Twenty miles of incomparable pictures, within compass of a shilling ride, with all the grime and sordidness blotted out by morning and evening mists! Bridges, lighters drifting with the tide, barges, tug-boats, wharves, tall warehouses, ships coming in from the other side of the world, steam-boats starting upon voyages as long, and all toned down by haze and mist to their most artificially suggestive but shape and form. We go far from home for pictures far less telling.

As allied with soft mist effects it must be a standing regret to all photographers with a touch of the artistic in their sculls that the September moon—the harvest moon—and its effects are not yet photographable. There is a restful charm about moonlight that appeals to all. We are not compelled to take in all the detail that sunlight forces upon us, yet have plenty of light for broad shapes and masses. Then, beyond the value of rarer presence, there is a wealth of sentiment associated with the moon that asserts itself in a sub-conscious way when under the recurring period of her sway. Love-making and moonlight go together, and many pleasing emotions as a consequence are laid by in the memory for future pleasure of vague remembrance on moonlight nights.

It is rather a peculiar fact that no moonlight picture is really complete to us unless there be a silver lane of the light on water shown in it. Is it due to the evolution of feeling as affected by an insular position that gives plenty of water? If so, would the Arab find his characteristic moonlight effects in the glint of light upon sand? the dweller in tropical lands in the lighting of a forest glade? Whatever can be said in praise of moonlight in general is all emphasised in that of the harvest moon, far and away the best of the year. We certainly have "moonlight" photographs—all, of course, "faked." Whether the faking is justifiable or not is a question upon which there is much diversity of opinion. Speaking generally, the amount of faking done is in direct ratio to the amount of original sin in the constitution of the faker, so discussing its ethics would not be of much purpose. Original sin is not open to argument. Some purists will have nothing whatever to do with it, others are convinced, and honestly so, that, the means being strictly subservient to the end, it matters little what they are, provided the end be attained. The best workable general line of action, perhaps—for it is of no use ignoring original sin, more than trying to argue with it—is going in the middle. The line between right and wrong, in this case, as in many others, may be a wavy and not a straight one. Faking a photograph required as evidence, or as a record, should be put down on one side—the one of wrong. Modelling a face is also wrong, touching out a wrinkle or two is not; something must be yielded to the frailty of human clay. In the particular case of moonlight pictures there is no great objection to faking

more than there is to mock turtle or electro-plate. They are all admittedly false, and known as such. In time, probably, a "moonlight" plate will be placed on the market, and we will have the genuine article.

Turning regretfully from the moon, there are other practicable subjects in the month. The last load of corn, if one is fortunate enough to be about at the time, has a something joyfully ceremonious and significant about its entry into the rickyard and unloading. It is now becoming, it is true, but a survival of what it once was. A good harvest is still of great importance, but not of such vital importance as it was when the price of the loaf depended upon home-grown corn only. It is very occasionally that we hear nowadays the thankful addition to the favourable comment upon the weather, as good harvest weather of, "and please God we shall have a cheap loaf," still it is a turning down when we do hear of the loaf at a significant place in a comparatively recent chapter of the economic history of the country. A picture of the farmyard with the gathered spoils of the year well in evidence, beyond serving its lighter purpose of a Christmas card, would make an illustration to the chapter. The "harvest home" is, perhaps, too impracticable for the camera. Introducing it and the flashlight would spoil both the supper and the picture. When that lens which will give everything beyond two feet in universal focus has been put together, and the emulsion that will register a snap-shot by candle light, spread upon its plate, we will attempt it. What a pity, by the way, that in the established order of things the scientific mind and the artistic temperament should be opposed to each other. Were it otherwise, we would gain a good deal that we now sadly need.

There are rustic festivities in September that are practicable. The village flower and fruit show is generally postponed until after the harvest. The flower show as a whole would probably turn out as disappointingly as such pictures as *On the Sands at M*—, or *The Mafeking Celebrations at N*—. The interest is diffused too much. But some choice little bits can be got by taking pains. The "First Prize" winner, for instance, with his marrow at his feet, or his cabbage under his arm, and joy—plus just one pint of beer—illuminating his face. "First Prize for 12 lbs. of honey in pots," would give another, and a higher type of face. The man who takes an interest in bees is quietly philosophical in a minor way. He hasn't, as a rule, seen any very heavy trouble in life.

Such are some September subjects. They take a little looking for and thinking over; but, then, so does everything else worth having.

ON THE RECENT PROGRESS IN DIRECT PHOTOCHROMY.*

I.

I PROPOSE to give a short account, mainly composed of references, of the recent progress in direct photochromy, which may serve as a supplement to the "Bibliography of Photography in Colours," begun by Mr. Bolas (1897) and continued and supplemented by myself (1899). At the same time, I shall make a few remarks on the importance of the classification and abridgment of knowledge attained, and also on the apparent tendency of modern research in direct photochromy.

Classification of knowledge in photography is, of course, neglected in England, and yet even in Germany, where all science is classified in the best way, photography has not, compared with other sciences, reaped the full advantage of method. The reason of this seems to be that photography is, to a great extent, incapable of it, owing to its vaguely defined province as a science; and so an excuse can be found for English neglect, though probably the whole truth is not brought out by this excuse.

There does not seem to be any immediate prospect of our being able to call photography a science; this can only happen when it is capable of being strictly defined, apart, of course, from any reference to picture-making. Perhaps the nearest approach to a science-making definition would be: Photography is the science of the chemical and physical effects of radiation; and, by combination with the theory of optical instruments, we get an art of photography. Even with this indefinite definition we have a science connected with the very hearts of the two main natural sciences, yet too small for any great generalisation and explanation out of its own province, and too large and with boundaries too vague to be thoroughly worked like some sub-departments of science are.

However, photography possesses such sub-departments, with limitations clearly defined, and which can receive all the benefits of classification and method in their study. Such a one is direct photochromy. Applying

* I am indebted to Miss D. P. Turnbull for some translation from the German.

our definition, we have "radiation" narrowed to "visible rays," and the "effects" become *special* effects, those only which correspond to the wave-length of the incident light in a definite way.* But the final elucidation of photochromatic methods, like that of, probably, all important photographic problems, rests on considerations based directly on the principles of physics and chemistry, and from these principles new methods, when they arise, and thus enter the region of direct photochromy, arise in general directly.†

Thus we get, naturally, two main divisions, clearly separated from one another, in a classification of the literature of direct photochromy: the one concerning the *principles*, which is not by any means purely photographic; the other, purely photographic, concerning the *processes*. It is, as one might expect, in the latter that the greater part of recent progress has been made. This is pre-eminently the province of the photographer; he is there practically independent of other knowledge, such as physics and mathematics, and his work is almost wholly experimental. This kind of work is of very great value; for, though it is unlikely that anything should be found by its means which throws light on the real nature of photographic processes, yet not only is the present usefulness of those processes wholly dependent on it, but subsequently such researches will form abundant means of verification of theory or rejection of hypothesis. More particularly, in our present subject, the new and improved emulsions discovered for Lippmann's process would hold the same place with any other process based on the same "principle of position," as I have called it. Among the improvers, photographically, of Lippmann's method, Dr. Neuhauss must be mentioned in the first line.

Dr. R. Neuhauss,‡ during 1898, made numerous experiments with Lippmann's system, which he described in the *Photographisches Rundschau*. Dr. Neuhauss began these experiments in 1894, and in Eder's *Jahrbuch* for 1898§ he gave a summary of his results,|| including a description of his photo-micrographical work, and a full description was given in Dr. Neuhauss's work mentioned below. In Dr. Eder's *Jahrbuch* for 1899¶ (pp. 70–74) he gave an account of the researches carried on in the summer, when the experiments of the previous year were repeated and fully confirmed.

Professor Lippmann ** has given a new formula for the emulsion to be used in his method, and for the development of the plates.

E. Valenta †† remarked that the necessity of giving exact exposures for mixed colours is connected to a certain extent with the colour-sensitising. The greater the difference of sensitiveness of the silver bromide for the principal spectrum colour, the more difficult it is to fix on any exposure which will give the best results. The ideal plate would be panchromatic, and, by the choice of suitable sensitisers, one must get as nearly as one can to the ideal. Valenta found glycin-red (Kinzelberger of Prag) very satisfactory, 12–14 c.c. in 100 c.c. of his emulsion.‡‡

References to other recent methods of direct photochromy, and to work on the principles, must be deferred to another occasion.

PHILIP E. B. JOURDAIN.

THE THORNTON FILM.

[Paper read before the Cripplegate Photographic Society, September 3, 1900.]

My purpose to-night is to demonstrate before you a new film, one possessing many advantages, and one that is simplicity itself in the manipulative details.

Of the relative merits of plates *versus* films, and *vice versa*, I do not

* This may even mean that colour effects need not be *visible*, as it is conceivable, e.g., that a definite structure should be formed by each definite wave-length, and yet not return any colour.

† Example, Zenker's theory; contrast the empirical origin of the process of Seebeck and others. *Indirect* photochromy analogously has its origin (with Maxwell) in principles far removed from photography itself.

‡ For a short account of Herr Neuhauss's book, *Die Farbenphotographie nach Lippmann's Verfahren* (Halle a/S, 1898), and his application of photo-micrography, to show the Zenker laminae in the Lippmann film, see my "Further Contributions, &c.," in *Photography*, June 22, 1899, pp. 422, 423.

§ English translation in *THE BRITISH JOURNAL OF PHOTOGRAPHY SUPPLEMENT*, July 1, 1898, pp. 50, 51; *ALMANAC*, 1899, 815–818.

|| Reference may also be made to the series of notes in the "Acta Eruditorum" of the *Amateur Photographer* for 1897, December 3, 17, and 31 (vol. xxvi. pp. 458, 498, 538); for 1898, February 4 and April 1 (vol. xxvii. pp. 86, 246), for 1899, January 27, p. 66.

¶ English translation in *THE BRITISH JOURNAL OF PHOTOGRAPHY SUPPLEMENT*, August 4, 1899, pp. 57, 58.

** *Bull. Soc. Franç. Phot.*, February 2, 1899, p. 117; *Am. Phot.*, March 10, 1899, p. 186; also (through Messrs. Fuerst) in, e.g., *THE BRITISH JOURNAL OF PHOTOGRAPHY*, March 3, 1899, p. 135.

†† *Phot. Corr.*; English trans., *Phot.*, September 21, 1899, p. 636.

†† Valenta: *Die Photographie in Natürlichen Farben*, p. 52.

propose to touch, as it is a subject you are all familiar with. But there is one point sometimes overlooked, which is a distinct disadvantage to films. It is, that you cannot have one of those accidental smashes, so useful to reduce the stock of negatives against your will, and for which all the same you are thankful.

The Thornton film consists of a film of pure gelatine, rendered insoluble, and coated with emulsion, the whole being supported upon a backing of transparent paper. The following points may fairly be claimed for it: 1. Simplicity in use. 2. No curling in development. 3. The transparent paper enables density to be accurately gauged. 4. There is nothing in the support that can detrimentally affect the emulsion. 5. It is non-inflammable. 6. It is very thin and flexible, yet tough and unbreakable. 7. The troublesome squeegeeing is avoided. 8. All operations are, with the exception of pinning up to dry, the same as a glass plate. 9. It is always flat. 10. Lastly, the price is the same as that of dry plates.

It would, perhaps, hardly be fair to describe the last as the most important, but to many workers the question of cost is a consideration. I know it is so to me.

The film is issued in all cut sizes packed flat, and also in daylight-loading spools in various sizes. For the purposes of this demonstration I am dealing with the flat standard sizes, and it is flat, very flat. It lies perfectly even and flat in the dark slide, with a plain piece of cardboard behind it; it remains so during development and fixation, and during washing, if that operation be not too prolonged. It is hung up to dry, after passing through a glycerine bath, with a pin at each corner. When dry—and, of course, it must be really dry—the film is stripped off in the easiest possible fashion from the paper support, and you have a beautiful negative or positive upon an absolutely transparent film, with ample density, finest gradation, free from halation, and with a very fine grain, finer indeed than some brands of plates.

No special developers are required. Naturally, with the instructions, formulæ are given which give the best results; but, in my developing, I have used my own bottles of hydroquinone, ortol, metol-hydroquinone, and pyro soda. It is a great advantage to have a film that does not need a special developer, or that does not bar the use of any particular developer. The transparent paper enables the density to be judged as easily as a glass plate, and the image can be seen just as clearly the whole of the time. Compared with films on paper of the usual sort, this is a very distinct advantage, as, when the paper is opaque or partially so, allowances have to be made, and therefore the actual result is not under such complete control.

After development, a hardening bath of chrome alum is required; but the makers recommend, and I cordially endorse it, a combined hardening and fixing bath, as it saves tiresome washing. This bath consists of—

Chrome alum	1 ounce.
Sulphite of soda	2 ounces,
Water	20 "
Hyposulphite of soda	6 "

the hypo being added after the alum and sulphite have dissolved. This bath can be used over and over again, until it won't fix, in fact.

When washed, the films are placed in a bath of glycerine, 1 ounce to 25 ounces of water, and then pinned to a board by the four corners to dry.

Compared, perhaps, with a plate, the glycerine bath is an extra operation, but it has to be used, we know, with thin celluloid films, so that it need not trouble you. And I think you will agree with me that pinning up to dry is much easier than squeegeeing, which is not a favourite occupation of the ordinary amateur, at all events, to say nothing of troubles in stripping off the board later on.

The stripping is a very strong point of the Thornton film. It is not a case of saying it will strip, but it does strip, and when you see the operation later on you'll admit it, I will let your Chairman strip a film. I prefer to do this, as, if he fails, I can blame him. Casually I may add that I've never had to blame any one yet. And no film that I have ever used stripped with such ease and absolute certainty.

Naturally, the film may be varnished as a protection against damp, and may be retouched in the usual way.

In concluding these introductory remarks, the point I have striven to make clear is that the manipulation of the film is as easy as a glass plate. Whether that is the best recommendation I can give it I do not know, but there it is, and it is so.

WALTER D. WELFORD,

IMPERFECT FIXATION OF PRINTS.

To any one who, like myself, has seen so many what I may call modern professional photographers—who pride themselves upon the fact that they have entirely taught themselves, and "never had a moment's tuition, sir"—at work, especially toning, fixing, &c., there is no wonder at the constant appearance of the above words in your Correspondence column; and, in fact, the general instructions given are misleading. Take, for instance, the preliminary washing. This is usually recommended to be done in running water for a quarter of an hour or so. To carry out these directions some workers fill up a flat dish with water, shove the prints in one, two, or three, or more at a time, and, when all the batch are in, turn on the tap and leave them for the quarter hour washing in running water. Others fill up the washing machine (used to wash hypo out of the prints and plates), and shove the prints in here for the quarter hour's wash, and each one wonders why he gets stained prints, and at once blames the paper.

Then, again, for fixing, the prints are placed in the hypo, not separately but in batches, just carelessly separated, and then left for the time the book says they require for fixing, and without any more moving about than the curiosity to see some of the prints prompts. The whole lot are lifted out of the hypo, pitched either into a flat dish or that abomination, a washer, the tap turned on and left for the regulation two hours. The result of all this is the Editor has to wade through acres of letters, full of bitter denunciations of So-and-So's paper, and of disappointment at the pictures, and to find some remedy.

Some little time ago you, sir, reviewed an ALMANAC containing a compilation of all good formulæ, &c., for P.O.P., and suggested that that chapter be reissued in book form. To that I would say, "Certainly;" but before that book is issued let the working details be revised by a practical printer. The need of this can be understood when it is pointed out that the compiler recommends the washing of the prints before toning in running water, without any directions as to keeping the prints separate, and without any caution as to using a washer used for hypo.

To succeed in obtaining good, clean, stainless prints, they must be put separately into a dish of clean water, then taken out of this water separately and put into another dish of clean water, and so on for six or seven changes, each print being handled separately each time, until the last change of water is quite clear of any trace of milkiness, showing that all free silver has been removed. After toning, each print on being removed from the toning solution should be put into a solution of sodium chloride (common salt), but care must be taken that the fingers that touch the salt solution are not put into the toning bath, or that compound will strike work. After toning give a wash of two changes of clean water, again handling each print separately. Then put each print separately into the fixing bath, and keep turning over and over each print the whole time necessary for the action of the fixing solution, and finally washing in twenty or thirty changes of water, with a bath of alum if preferred after the first twenty changes.

Keep the prints in motion during all the operations, handle each print separately at all stages and sub-stages, avoid alum before fixing, avoid washing in running water (especially in flat dishes or in so-called "washers"), and, above all, be especially careful to avoid any taint of hypo getting near the prints before they are toned.

W. T. WILKINSON.

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY'S CONTINENTAL EXCURSION TO THE RHINE VALLEY AND AHRGAU.

The South London Society's annual Continental excursion, under the leadership of Mr. William F. Slater, F.R.P.S., is becoming one of the popular features in the photographic world. The small party of eleven which attended the first excursion three years ago to Hamburg has increased year by year to a party of fifty-four (seven of which were ladies), representing fourteen societies, amongst whom were some well-known photographers from Bolton, Croydon, Exeter, Fakenham, Manchester, Reading, Usk, and the Scilly Islands. The following account of the excursion is contributed by one of the party:—

On Saturday, August 18, we met at Liverpool-street Station, where our leader handed each a special badge to wear for the occasion. A large saloon and two compartments were reserved for us, in which we travelled to Harwich, thence to the Hook of Holland, by the s.s. *Dresden*, the finest boat in the G.E.R. Company's fleet, where all our berths had been reserved, our party occupying seventeen cabins. Arriving at the Hook of Holland early Sunday morning, we travelled to Cologne, and then on to Remagen. On arriving, we at once proceeded to the Hotel Victoria-berg, our headquarters, where everything was done by the proprietor and staff to make us comfortable. It was rather a long job in getting the bedrooms settled, and hard work for our leader, as the hotel could only sleep twenty-four, the other thirty being placed in private houses in the locality, and all were satisfied with the accommodation provided. Our programme was gone through without any deviation whatever, our leader keeping us up to time. Exactly at six o'clock we took our seats for dinner, our menu consisting of soup, salmon, beef, veal, chickens, ices, and fruit, and each day during the week we sat down to a similar repast.

Dinner being finished, and most of us very tired after so much travelling' we very soon retired.

On Monday morning many were up early, to find our leader waiting with the railway tickets for the day's trip. After a good meat breakfast we made our way to the station, and travelled to Bingerbrück, a ride of over fifty miles through very fine scenery, as the rail skirts the Rhine nearly the whole way. After travelling some distance, many were eager to sample the fourth-class carriage, so most of the party left their reserved carriage to travel in a class lower than we can in this country, and came to the conclusion it was better for a party, as all could be together and not shut up in compartments. It was what one might call a third-class saloon. On arriving at Bingerbrück we followed our leader to the pier at Bingen, where he dismissed us for two hours, and on our return he was waiting with the tickets for our boat ride back to Remagen. This is through the finest scenery of the Rhine, but we did not have the luck to see it at its best, for as we left the pier the lightning lightened, the thunder thundered, and very soon the rain it rained. No; it more than rained, it came down in torrents, so we had a wet journey nearly the whole way, which is about sixty miles. It was a good thing it happened this day, as we could keep under cover and still see the scenery. The Rhine steamers are very fine and the catering perfect; one can obtain any fare, from the modest roll and butter to a *table-d'hôte* dinner. We arrived back somewhat late, owing to the storm. After dinner we were entertained by some of the party with singing and recitations. Tuesday we went to Cologne by train. The Cathedral here is the centre of attraction, where our leader had permission for us to photograph inside. It is hard to find an adjective to describe this grand edifice, it wants seeing; one cannot really describe it without spending a much longer time than we had to inspect it. We also had permission to photograph inside St. Gereon's Church, which is highly decorated with many colours, but contains many subjects suitable for the camera.

After dinner this day we had a good concert, our artists being Mr. Taylor, pianist, Mrs. Walker, and Messrs. W. E. Dunmore, Benzon, Hardee, G. Slater, Oakley, Holland, Walker, and Knight. Herr Nelles, a German, sang us some German songs, so we called for three cheers for the German Emperor, one for the Empress, and one for his grandmother, this put us on good terms with our German friends. A Mr. Van Dam, from Rotterdam, sang us the Dutch National Anthem, after making a speech saying how friendly he had always been treated by the English, and was proud to be in our company in Germany, so, of course, we called for three cheers for Queen Wilhelmina, our leader stating that two years ago this excursion was taking place in Holland. We brought the concert to a close by singing the English and German national anthems. Wednesday we were called at 6 a.m., breakfast at 7, and left by the 8 o'clock boat for Königswinter, and on arriving we at once commenced the ascent of the Drachenfels; some went up by the cog-wheel railway, but they missed all the fun. It was a fine sight to see some well-known photographers riding on donkeys up the hill, but we who walked had all the fun and the best chances of snap-shottting. From the top of the Drachenfels one gets a fine view of the Rhine as it winds through the rocky hills, but those who took the trouble to climb the great Oelberg were well repaid, from the top of which a grand panorama was spread before them; in one direction Cologne Cathedral could be plainly seen and the winding of the Rhine, with the Drachenfels and other hills in the foreground, was a finer sight than one can describe. We returned to Königswinter and then by boat to Remagen.

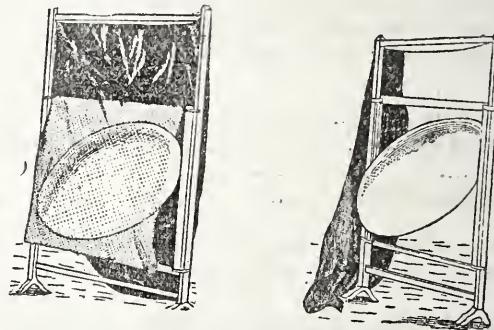
Thursday was the crowning day of the week. We travelled by train to Ahrweiler, whence we were to start our dreaded walk of seven and a half miles which our leader had imposed on us; but he knew best, and we would not have missed this walk through the incomparable scenery for anything. Ahrweiler is a quaint, old-world town; with its walls, gates, and old buildings, one can find plenty of material for picture-making. Our leader took us on by easy stages to Walporzheim, and on through the romantic scenery of this valley we pass the "Bunte Kuh" and the poetical villages of Marienthal and Dernau, where there is plenty of work for the camera. A little further on we leave the road for a time, and cross the bridge over the Ahr to visit the very old village of Rech, where one can get pictures at every turn. In fact, one of the party remarked that, if we stopped here and at Dernau for a week, we should have to buy the whole stock of a well-known firm of plate-makers. We now go on to Mayschoss and Lochmühle, through the tunnel, and pause to look at the view before us. We then retrace our steps to the footpath, and ascend through the vineyards to the top of the hill, from which we get a grand view. On one side we can follow the valley of the Ahr, and on the other we look down on the prettily situated village of Altenahr, our destination. We return by train to Remagen, with all our plates exposed. I cannot say how many were actually used between us; one of the party was known to have exposed sixty plates on this day. After dinner we had another concert, and during the evening a choir of ten Germans gave us some fine music, and, in reply to a vote of thanks we passed them, said they had thoroughly enjoyed themselves in our company, and were glad for us to be hand in hand, especially as Germany and England were at the present time the same in China. I may say here that everywhere we went during our stay we were received and treated with the greatest civility, and on no occasion was any antagonism shown us.

Friday we travelled to Bonn by boat. The Munster Church is very fine. We had permission to photograph inside, which is so very dark, and in consequence a large amount of photographic work was impossible. It contains some fine subjects, but the exposures would be very long. After dinner Mr. H. Newson, in some appropriate words, proposed a vote of thanks to our leader, and asked Madame Benyon to hand Mr. W. F. Slater, on behalf of the party, a small present to show our appreciation for the trouble he had taken in giving us so fine a holiday, after which we drank his health with musical honours. Saturday being an off day on the programme, our leader said we had been good children all the week, so he would give us a day's holiday. So some took themselves off to Coblenz and Boppard, while others went to Godesberg and Cologne, but the majority of the party revisited the Ahr Valley, where they had enjoyed themselves so much on the Thursday. Sunday morning was spent in Remagen, some going to the Apollinaris Church; others crossed the river to Erpel, and found it abounded in work for the camera, wishing they had another day left to photograph there, having a mid-day dinner, after which a vote of thanks was passed to Herr Langen, the proprietor, for the able manner he had catered for all our needs. Any one visiting Remagen cannot do better than stop at the Hotel Victoria. We left Remagen by the 3.12 train, breaking our journey at Cologne for one and a half hours. We then proceeded to the Hook of Holland, and once again on the s.s. Dresden, having the same berths reserved for us as on our outward journey. The sea was not so smooth as we should have liked, but we arrived safe in London soon after nine o'clock on Monday morning, having spent a most happy week with jolly company, nothing to trouble about, as our leader had arranged everything for us and carried the programme through without a hitch.

THE USE OF CONCAVE REFLECTORS IN AT-HOME PORTRAITURE.

A HINT on the subject of illuminating the shadow side of a sitter's face, in at-home or non-studio portraiture, is given by Mr. A. P. Sargent in the *American Journal of Photography* for August. He remarks that reflectors are often very injudiciously employed. In the endeavour to illuminate the shadow-side of the head so much light is thrown upon it as to entirely obliterate all texture, to represent which, in proper subordination, should be the aim of every good photographer. The operator is not always possessed of that great aid in proper illumination, the modern slant light, and, having to make the best use possible of the means at his command, must depend to a considerable extent upon lighting up shadows. Where the skylight is small, or where there is no skylight at all, so to say, it is of special requisition.

"The reflector which I employ," proceeds Mr. Sargent, "I did not invent



myself, I believe the inventor's or adapter's name is Griswold. The reflector is a concave one, a yard in diameter, made of sheet iron or tin, hammered into shape and afterwards planished. It turns on pivots within a frame, so that it may be turned at any angle desired. The frame carrying the reflector runs up and down like a window sash within another frame about six feet high, which is mounted on legs like a background frame. By this means the light may be thrown up or down, or in any direction the case may demand. On the back of the outer frame is fixed an opaque curtain, which can be drawn across the outer frame to cut off all reflection, except from the reflector itself; for, in ordinary sitting-rooms where portraits are made, the reflections are often very annoying and perplexing. But this dark curtain keeps out all except that desired to be reflected. When the light is strong, it will be found necessary to screen the reflector with cheese-cloth or tarlatan, or some other gauzy material. By placing the cloth over the face of the reflector the light may be beautifully modified and some pleasing effects produced by employing gauzes of different colours. When the sitter has a full round face and light hair, a child for instance, make use of a buff gauze. Greater contrast is thus secured in a negative. For dark complexions or sharply defined features, a sparseness of countenance, blue is very advantageous. The accompanying cuts will give better ideas of the construction than a verbal description."

PHOTOGRAPHIC CLASSES AT THE GOLDSMITHS' INSTITUTE, NEW CROSS.

A CIRCULAR has been sent us giving particulars of the classes in photography which will be held at the Goldsmiths' Institute, New Cross, during the approaching winter. For the information of likely students we append full details:—A course of twelve lectures and demonstrations on practical photography will be given on Friday evenings at 8.30, commencing on September 28, 1900. The following is the syllabus: Apparatus. Dark room. Dry plates, films, &c. Exposure and development with practical demonstration. Intensification and reduction of negatives. Varnishing, retouching, and spotting out. Printing and toning on various P.O.P. papers, vignetting, masking, printing in clouds, &c. Gaslight printing on bromide paper, Velox, etc. Carbon and platinum printing, mounting, enamelling, burnishing, spotting out, &c. Lantern-slide making by contact and by reduction on wet collodion, on gelatine dry plates and by carbon process. Enlarging on bromide paper and making enlarged negatives. Isochromatic photography, &c. The first lecture of the series (September 28) will be an explanatory one, and will be supplemented by an exhibition of negatives, prints, lantern slides, &c., made by past pupils and by members of the Goldsmiths' Institute Camera Club. All who contemplate joining photographic classes at the Institute are invited to attend. The fee for the Course is five shillings.

A course of twelve lectures and practical demonstrations on practical photography, for ladies only, will be held on Thursday evenings at 7. Commencing on October 4, 1900. The fee for the Course is five shillings.

A series of twelve advanced classes in photography will be held on Tuesday evenings, from 7 to 9.30, for individual practice in particular branches of the subject. Students joining this class can obtain individual instruction in the technique of ordinary photography, copying, enlarging direct or from enlarged negatives, transparency making, photomicrography, three-colour photography, &c. This class commences on October 2, 1900. The fee for the Course is twelve and sixpence.

A series of twelve classes for individual instruction and practice in photo-lithography and collotype will be held on Wednesday evenings at 7. Commencing October 3, 1900. The fee for the Course is twenty-one shillings.

A series of twelve classes for practical demonstration of, and instruction in, process engraving in half-tone, will be held on Monday evenings from 8 to 9.30. Commencing October 1, 1900, the fee for the Course being twenty-one shillings.

A series of twelve classes for instruction and practice in photogravure will be held on Friday evenings from 7 to 8.15. The fee for the Course is also twenty-one shillings.

The instructor in all the foregoing classes is Mr. W. T. Wilkinson.

The photographic studio and dark room are very completely equipped, and are fitted with electric arc lamps for copying and portraiture. The department is provided with studio, landscape, lantern slide and copying cameras, an enlarging lantern, and a powerful electric projection lantern; it also possesses complete outfits for photo-lithographic and collotype work, for platinotype and carbon printing, and for retouching and other branches of modern photographic practice.

Students must provide their own sensitive paper and plates, but all chemicals and apparatus required will be furnished by the Institute.

Since the photographic classes are necessarily limited in number of students, applicants will be accepted in order of application. Should a sufficient number of applications be received, other classes will be held on separate evenings.

PHOTOGRAPHIC CLASSES AT THE NORTHAMPTON INSTITUTE.

A BOOK of 200 pages is occupied with the announcements, educational and social, for the Session 1900-1901, of the City Polytechnic, as the Northampton Institute, St. John-street-road, E.C., is alternately called. The educational aim of the Northampton Institute is to provide classes in technological and trade subjects, a branch of educational work scarcely touched by the sister Institutes. To this end attention is paid first to the immediate requirements of Clerkenwell, the district in which the Institute stands. We extract from the section of the book which deals with the Applied Physics department the following particulars relating to the classes in colour photography and process work:—

TRICOLOUR PROCESS WORK AND COLOUR PHOTOGRAPHY.

The following special lecture and practical courses for photo-process workers and general photographers have been arranged in co-operation with the London County School of Photo-engraving and Lithography, Bolt-court, E.C.

Tricolour Process Work.—Lecturers, Dr. R. S. Clay and Mr. Charles W. Gamble (Bolt-court School).—A course of eight lecture demonstrations with practical work, on Tuesday evenings, from October 2 to November 20 inclusive.

Lecture Demonstrations—Tuesdays, 7 to 8 p.m.—Syllabus: General introduction; absorption and reflection of colours; primary spectrum

colours, and "primary" pigment colours; choice of pigments and screens for tricolour work; influence of order of printing; use of ruled screens; best conditions of lighting and using the camera; production of the negative; general outline of the production and treatment of blocks; selection of paper; printing.

Practical Work.—Laboratory Work, Northampton Institute, Tuesdays, 8 to 10 p.m. Photo-process Work, Bolt-court School, Fridays, 7 to 9.30 p.m.—Only those engaged in the process trade can be admitted to the practical class at the Bolt-court School in accord with the rule in the tricolour class. The laboratory work at the Northampton Institute will consist in the production and spectroscopic testing of colour filters and pigments, and the arrangement of the camera and lighting and production of the continuous tone negatives. At the Bolt-court School screen negatives and blocks will be prepared, and the necessary finishing, mounting, and taking of the prints will be carried on.

Colour Photography and Measurement.—Lecturers, Dr. R. S. Clay and Mr. Charles W. Gamble.—A course of eleven lecture demonstrations with practical work on Tuesday evenings, from November 27 to February 19 inclusive, as a continuation of the preceding course. The course is further intended for professional photographers and others having a good knowledge of ordinary photographic work, and who desire to become familiar with colour photographic processes.

Lecture Demonstrations—Tuesdays, 7 to 8 p.m.—Syllabus: Nature of white and coloured light; principle and use of spectroscope; Maxwell's colour vision curves; addition and subtraction of colours; making and testing of colour screens; colour sensitiveness of photographic plates; orthochromatising; choice and testing of dyes for orthochromatising.

Absorption Methods—Explanation of Ives's, Joly's, and Lumière's processes and their working. Kromskop and other viewing arrangements. *Interference Processes*—Lippmann's process and its explanation; recent developments of Lippmann's process. Primary and complementary colours, formation of all colours from primary colours; peculiarities of colour vision and colour blindness; Lovibond's tintometer, explanation and mode of use; measurement of colours and classification of pigments.

Practical Work—Tuesdays, 8 to 10 p.m.—In the laboratory the students will have an opportunity of testing and preparing colour screens by the spectroscope, and of photographing the spectrum, and also of orthochromatising plates. At the Bolt-court School they will use these screens and plates for actual photographic work, and will then be shown at the Northampton Institute how to mount their results for viewing.

Half-tone Process Work.—Lecturer, Mr. Charles W. Gamble (Bolt-court School).—A course of six lecture demonstrations with practical work at the Northampton Institute, on Tuesday evenings, from February 26 to April 2, 1901. The object of this course is to give the simplest possible exposition of the scientific principles underlying half-tone work, and also an account of the best practical methods and plant to be employed.

Lecture Demonstrations—Tuesdays, 7.15 to 8.15 p.m.—Syllabus: Object of breaking up half-tone into line and dot for relief printing; mechanical methods of converting bas-relief into line and dot; use of V tool; optical methods of breaking up; use of cross-line screen; conditions for securing true optical V; influence of width of screen ruling, size and shape of stop, distance of screen and sensitiveness of plate on the results; practical details of process cameras, lenses, and accessories; lighting, exposure, and development; preparation of block, exposure, etching, &c.; finishing blocks, fine etching; routing; details of finishing and printing machinery; choice of paper and printing.

Practical Work—Laboratory work, Northampton Institute; Tuesdays, 8 to 10 p.m. Photo-process Work, Bolt-court School, Mondays, 7 to 9.30 p.m.—The laboratory work will be taken after the lecture, and will consist of experiments illustrating the effect of the screen, stop, and distance on the form of the dot, performed with the help of special apparatus, and the whole of the procedure up to the production of the negative. At the Bolt-court School the whole of the processes of making and finishing the block, and the printing therefrom will be carried out.

THE PHOTOGRAPHIC CAMERA AS AN ACCESSORY TO LECTURING.

THERE is always a danger of confusing our audience if we use a string of technical terms and calculations without supplementing such with practical demonstration. This is particularly true when we are treating the subject of optics.

The photographic camera has often been compared with the human eye, and, indeed, its structure and function are very similar, so that, roughly speaking, we may say: What the photographic artist is able to do by means of his camera, plates, and chemicals, every common observer instinctively accomplishes by means of the eye, nerves, and brain. Hence it is not surprising so many refer to this particular instrument when they wish to illustrate "what we see and how we see it."

Thus, assuming that the lecturer has so made use of these comparisons, we next consider how he may utilise his instrument still further for demonstrating to his audience the truth of his remarks. Let us select

that condition of vision known as long sight, illustrating the defect and the remedy. For this purpose we require a large camera *G* (fig. 1), dimensions according to size of our audience. The camera is attached to a substantial table or stand by means of the ordinary T screw. It is connected in this manner, so that it may be swivelled round at different stages of the experiment. A long rod *F*, shown in all three diagrams, is now fixed to the front of the camera, so that it moves with the camera as the latter is turned. At the end of this rod an incandescent electric lamp *C* is fixed, deriving its current from an accumulator *E* (fig. 1) placed in a suitable position underneath the table or stand.

The screen *B* consists of a piece of ordinary ground glass, rather wider

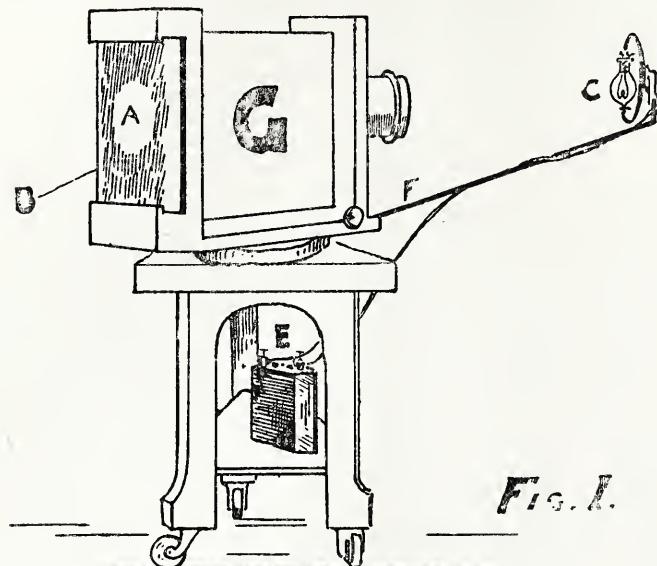


FIG. 1.

than the back of the camera, so that it may be readily withdrawn and replaced at will.

Having so arranged his apparatus and provided himself with a double convex lens *D* (fig. 3), the lecturer is ready for his public demonstration. The light in the hall is turned low, and the electric light *C* switched on. The camera being so placed with the screen *B* turned towards the audience, a blurred image of the lamp *C* will be seen on the screen at *A*. "Ladies and gentlemen," says the lecturer, "having observed the similitude of the photographic camera to the human eye, we shall now endeavour to illustrate by means of this apparatus some of the phenomena of sight. In the first instance, please regard the camera as it is now adjusted, as a long-sighted eye. A long-sighted eye cannot see near objects clearly because the rays are not brought to a focus soon enough, the humours not being sufficiently dense. Hence we observe a blurred image of the

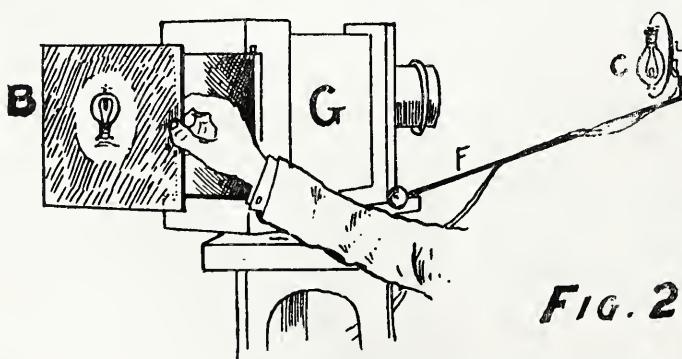


FIG. 2.

lamp upon this screen." (Here the camera is swivelled round to give every spectator a proper view of the image.) "Now, if such is the case, we shall find the *distinct* image somewhere behind the eye; with the present apparatus, somewhere behind the screen." (Here the ground glass is withdrawn from the camera and gradually moved towards the audience, until the distinct image is found, as shown in fig. 2.)

"Here" (continues the lecturer) "we discover the distinct image, proving that the refraction of the lens of this camera, which we are regarding as a long-sighted eye, is not sufficient to bring the rays to a focus upon the retina, the screen in its first position. (Placing this ground glass back again into its original position, the lecturer continues.) This defect of the eye, when it is not accompanied with disease, may be completely remedied by a convex lens, which makes up for the flatness of the crystalline, and enables the eye to converge the pencils flowing from near objects to distinct foci on the retina." (Here a double convex lens *D* (fig. 3) is taken, and held between the lamp and camera lens as shown,

when the image of the lamp, hitherto indistinct, is sharply focussed upon the screen.)

It is obvious that similar experiments may be made to illustrate various other defects in sight by changing the arrangement of the apparatus and using other forms of lenses.

It should be remarked that, to ensure complete success with the

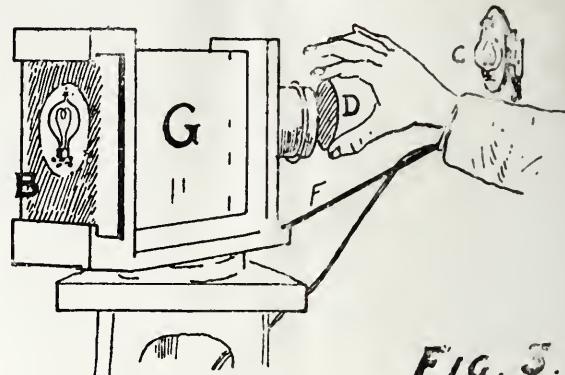


FIG. 3.

experiment described, the camera should be adjusted previous to public demonstration, so that the lamp *C* is sharply focussed upon the screen when the lens *D* is held before the lens as shown in fig. 3. By taking such precautions all after-focussing will be unnecessary, and no confusion will result.

THEODORE BROWN.

BILBIN'S SUPPORT FOR FOCUSING CLOTHS AND SCREENS.

[Patent No. 15,693 of 1899.]

THE appliance can be made in the form of a solid bar rod or tube of brass or other suitable material and can at the option of inventor be in either of the following forms. Drawing (fig. 1) is a hollow tube into which *B* slides. The rod *n* being kept in position by the keeping screw *c*. The rod *B* being supplied with a hole *j* at the extremity for the admission of a wire, cord or rod *s*. The tube *A* is pivoted or hinged to the slab *x* at the point *d*. *r* is a keeping sheath which is pivoted under the milled screw *e*. *H* is a metal slab with two or more holes, *i*, through which screws pass for fixing. A ball and socket joint may be placed beneath the keeping screw *e*, to regulate the tube *A* and bar *B*. In operation

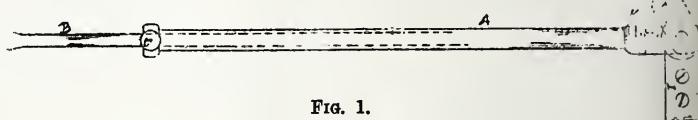


FIG. 1.

the tube *A*, being brought into its socket *x*, is kept in position by the keeping sheath *r*, the screw *e* being tightened to prevent the keeping sheath *r* from movement.

The metal or other slab *H* is provided with two or more holes through which screws pass for securing the fixed appliance to the side top front or any other portion of a photographic camera or other apparatus. Drawing *A* is a bar composed of brass or other suitable material. *B* is another bar of brass or otherwise, each being provided with any equal number of holes in the centre and opposite each other at convenient distances.

The bar *A* is hinged or pivoted to the slab *i* at the point *d*. *F* is a

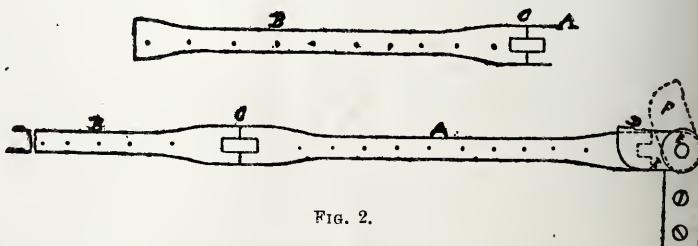


FIG. 2.

keeping sheath. *E* is a keeping screw. *G* is a brass or other slot provided with two or more holes for screws to pass through for fixing purposes.

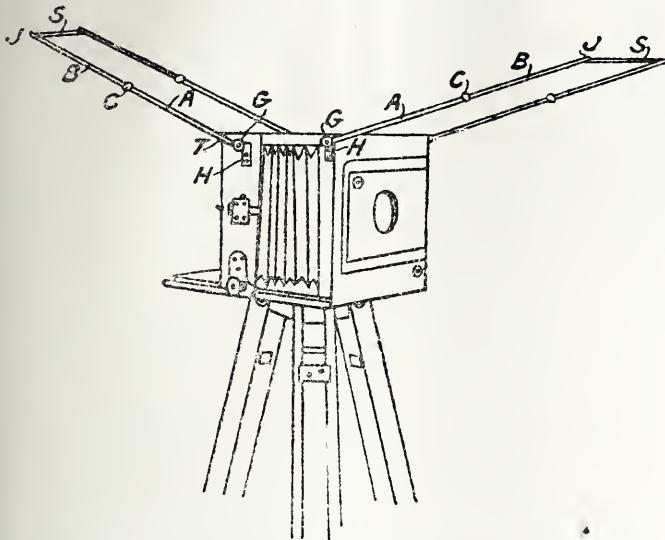
In operation the sheath *r* being brought over the hinged or pivoted portion of bar *A* at the point *d* keeps this rigid when the milled screw *e* is tightened.

The hinged portions at *d* and *c* are both stop. The holes in the centre of bar *A* and *B* at equal distances are for the purpose of putting a wire

or rod through to support a cloth or other material to form a screen, and when the distance from the lens is required for short or wide-angle lenses the bars A and B are folded together to get the desired length of screen.

Slab G is provided with two or more holes through which screws pass for securing the fixed appliance to the side front top or any other portion of a photographic camera or other apparatus.

The fixed appliance can be arranged to any angle required, by loosening



milled screw G or E (fig. 2, complete specification) thereby keeping cloth or screen out of angle of lens.

The tubes of brass aforementioned can be reversed and used to form a support for cloth when focussing, or camera can be fitted with duplicates either in the form of a rod, bar or tube. When used as a support for focussing cloth the metal slab H or G can be attached to the side or top of back of camera at T. When not in use for either purpose the brass rod or tube A, B drop over the top of camera either in front or at back by releasing the milled screw G or E and keeping sheath F.

LOESCHER'S IMPROVEMENTS IN ROTARY PHOTOGRAPHIC PRINTING MACHINES.

[Patent No. 10,282 of 1900.]

THE principal disadvantage of the photographic printing process consists in the comparatively long duration of exposure, which is necessary for transferring the negative to the positive paper. Since, moreover, each sheet of paper is generally put singly within the copying frames, still further loss of time ensues, which is specially noticeable in the production of photographic copies on a large scale or in large quantities.

In order to overcome these drawbacks, quite a number of copying processes have already been suggested and also partly carried out in practice for the use of bromic silver paper. The same have for their object to reduce the space of time required for copying to a minimum, to make the manipulation of the copying independent of the intensity of the daylight, and moreover to carry out the copying in a continuous process.

The majority of the processes introduced for such copying show, however, in practice, a number of drawbacks, which render a competition of the so-called machine photographs with the photographs made by the hand-copying process extraordinarily difficult. These disadvantages consist essentially in the fact that either the copying with exposure machines, which possess a cylindrical negative, mostly produce only indistinct positives, or that the mechanism of the exposure machines, which work with flat negative plates, only allows of an intermittent but not continuous working, and consequently is less reliable, and unmanageable.

The invention relates to an exposure machine with rotary negatives, as is shown in the drawing.

In connexion with the construction of the new exposure machine, the arrangement known *per se* of transparent negative cylinder is made the starting point. The new machine contains such a transparent cylinder a, on whose shell or casing the photographic negative is provided as a film in a suitable manner.

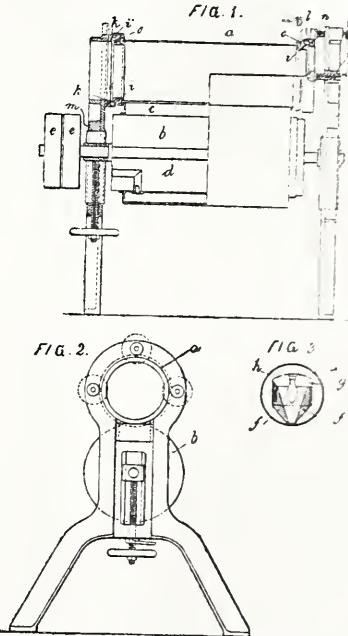
Opposite the cylinder a is located a second cylinder b, whose casing or mantle is formed by an elastic air cushion c; this elastic cushion effects the transmission of the rotation of the one cylinder to the other without fear of sliding or slipping. The machine is driven from the one or other cylinder, preferably, as shown in the drawing, from the cylinder b, whose preferably vertically adjustable axle d receives two pulleys e for this purpose.

The sensitised paper is inserted, by means of suitable guides not shown on the drawing between the two cylinders in such a manner that the film is opposite to the transparent negative cylinder a. Now, if the glass cylinder a provided with the negative is illuminated from within, the sensitised paper between both cylinders will be exposed to the light and can then be developed in suitably constructed machines.

For the production of distinct positives on the sensitised paper, the uniform guiding of the same is of special importance, which, as already mentioned, is uniformly pressed by the air cushion c of the cylinder b against the contacting part of the cylinder a.

In order to make this guiding possible, the rotatable negative cylinder must be mounted in the most careful manner, which has hitherto always been neglected in similar machines. Such bearing can, however, only be attained by mounting the whole periphery of the cylinder ends on balls. Such bearing is also necessary of making the inner space or chamber of the negative cylinder accessible from the sides. The bearings for the cylinder a consist of the rings k, l serving as travelling surfaces for the balls i, such rings being secured on the standards m of the machine in any suitable manner. The one ring l is preferably adjustable against the cylinder end by screw spindles n with hand wheels. The counter bearing rings o are secured at the end edges of the cylinder a in a suitable manner. In this manner is attained an absolutely secure bearing of the hollow rotatable glass cylinder a, and the interior of the same remains accessible from the side.

In order to avoid a preliminary or subsequent exposure of the sensitised



paper the exposure may of course only take place on a comparatively very small strip of the cylinder mantle or casing. There must therefore be provided in the transparent cylinder a a light-collector or reflector connected air-tight to the latter and allowing of the light to pass through the cylinder mantle or casing only that part where the sensitised paper is pressed by the air cushion c of the cylinder b against the cylinder a. The reflector with the light has, of course, not to participate in the rotatory movement of the cylinder a.

Fig. 3 shows the exposing arrangement in question. The reflector consists of the air-tight side parts or wings f, which are fitted within the frame g, that is firmly connected to the frame block m of the machine but may easily be detached therefrom. The frame g, which preferably consists of blank or bright metal, bears the electric incandescent lamps h or any other light source which may be used. The side parts f forming a box for the lamps are preferably controlled by springs, so that their inner edges are tightly pressed against the cylinder a. These edges of the side parts f only leave a narrow slot free, through which the light acts upon the positive paper.

In such an arrangement the exposed negative on the cylinder a must produce on the paper or its sensitised film exceedingly distinct or sharp positive copies, for, in contradistinction to the exposing machines with flat plates, a uniform pressure of the paper against the negative takes place on all parts of the exposure. Moreover, by this arrangement, in which a continuous feed of the paper takes place, a much quicker progress of the work can be made than is possible with intermittent feed of the paper in plate-exposure machines. Moreover, the described arrangement of the machine allows of the negative being observed during the exposure.

In order to expose a larger number of paper rolls at the same time, several cylinders can, instead of one cylinder b, of course be also pressed with the paper of the rolls against the negative cylinder a.

GARCHEY'S IMPROVEMENTS IN COLOUR PHOTOGRAPHY.

[Patent No. 19,843, of 1899.]

All photographic processes, says the patentee, by powdering hitherto described are based upon bichromate solutions as devised by Poitevin. The chief objection to these solutions is the fragility of the film which on washing in most cases disappears or is damaged, thus destroying the photograph.

One object of my invention is to strengthen this film by incorporating a reinforcing substance with the emulsion. Collodion presented itself, but there was great difficulty in mixing it with the sensitive emulsion. All these solutions contain much water, and if collodion were introduced it would be decomposed forming a precipitate of cotton. In order to avoid this difficulty I have devised the following process.

1. I first dissolve the bichromate in the least possible quantity of water, or I employ a saturated aqueous solution.

2. With this I incorporate sirupy matter, such as honey, glucose, or dextrin.

3. I add alcohol and a small quantity of anti-photogenic colouring matter.

4. And, lastly, I introduce collodion, which melts in the mixture without decomposing, or, instead of collodion, I introduce ether and then cotton to dissolve in it and form the collodion in the mixture.

The anti-photogenic colouring matter introduced is intended to prevent the soft effects of the interference of luminous rays which sometimes present themselves on proofs on glass, opal or the like.

The emulsion prepared as above described is employed to sensitise plates, and these, after the image is developed can be repeatedly subjected to acidulated washings without injury, and thus very large plates may be employed, such as could not be used when methods hitherto known are used.

For applications of photography in colour or in producing impressions in various tints I have found it necessary to isolate the photographed and developed film between two successive positives.

Thus before each new print I cover the film which has already on it a first colour impression, with a layer of a weak, about two per cent. solution of organic material, such as gum or gelatine. I can then apply emulsions to the negative as often as I desire, the isolating layer preventing the new emulsion from dissolving the previous ones.

For producing enamels I prefer to use plates of glass, porcelain, metal or other material that can be baked, and for developing the pictures I employ coloured powders of vitrifiable enamels.

For producing prints on paper, paste-board, celluloid or the like, which are not intended to be baked, I operate in the same way provided that the negatives are in the first place made impermeable, and I develop the pictures with coloured vegetable or mineral powders.

If, for instance, Ducos du Hauron's method of photographing with the three fundamental colours is employed, I operate as follows:—

After having printed and developed, by yellow powder for instance, and washed with acidulated water, the bichromate film strengthened with collodion which has been exposed to the plate forming the yellow screen, before being treated for the other tint colours, has spread over it a layer of isolating matter and is dried. Then a fresh emulsion can be applied, and the film can be exposed to the screen for blue and developed and powdered with blue. After washing with acidulated water the like operations are repeated for the red. Many other tints might be applied if necessary.

As I have stated, my process allows of very large films being employed, but, in order to avoid the use of very large screen plates, I print by projection and direct enlargement, and thus I can decorate large surfaces with photographs in colours.

The application of pictures in black or in colour to large glass plates is objectionable because, if the pictures are transparently looked at, the half tints become thin and have only their value when the surfaces are covered with a layer of translucent enamel.

I remedy this by first applying over the whole surface white or dull enamel powder, thus having a translucent ground for the desired colour. On this ground I put a layer of the isolating material, sensitise afresh and develop as many times as desired, as above described. On baking, the ground becomes indelible and the desired effect is obtained.

Studio Gossip.

LAST week Mr. Mullins, of Ryde, had the honour of taking photographs of the Queen and the Royal family at Osborne, and of their Royal Highnesses the Duke and Duchess of York's children, who are staying at Kent House.

MESSRS. GUNN & STUART, of Richmond and Sloane-street, have been honoured with sittings by H.I.M. the Shah of Persia, the Grand Vizier, and suite at Ostend. A considerable number of photographs were taken of H.I.M., some singly and others in groups, and some are characteristic of his love of sport. In one of them H.I.M. is taken in the act of firing at a coin tossed into the air and in other attitudes, forming a unique series.

"VISITORS to the Ober-Ammergau Passion Play will hear with interest that if they had only saved their money, stayed at home, or taken their holiday at a well-known East-coast resort," says *The Traveller*, "they might have witnessed the great play there on Sunday nights—*cinematographically!* One who has come back from a neighbouring chaplaincy, and knows all there is to be known about the Tyrolean village and the arrangements in connexion with the play, warns the unwary that a reproduction of the play taken from life is absolutely impossible, as it is forbidden to take even a hand camera into the great theatre, so that the cumbersome apparatus of a cinematograph could never escape detection."

THE SHAH AS SNAP-SHOTTER.—"Although the Shah of Persia has proclaimed a ban against the snap-shot photograph when he is himself its victim," says *The King*, "he is not averse to trying his own hand with the festive camera. While he was in Paris the Shah spent an almost fabulous sum in buying photographic material, and, hastening to the gay and festive Ostend, immediately proceeded to test the value of his easily won and easily spent money. Perhaps in time he may prove himself an expert photographer, and, if by chance the royal throne of his ancient monarchy should become vacant, he can put to practical use the experience gained in his hours of ease and affluence. In the mean time, however, he will probably learn to know all the little ironies of life which confront the amateur photographer at every turn."

AN ALL-NIGHT PHOTOGRAPH.—Mr. C. Harrington, of the Custom House, Harwich, writes in the *Strand Magazine*: "I had been engaged in photographing my bedroom, and had found that my plate, a Sandell landscape plate, was very much under-exposed at f-32 after two hours' exposure. It then occurred to me to leave it exposed all night. I went to bed at 11 p.m., took off the cap, and went to sleep, never waking till 4.45 a.m., when I remembered my camera, and hastily jumped out and replaced the cap. On developing I found the room was fairly correctly exposed—the blind was down—but the face and bed, being light, were over-exposed. The face had been slightly blurred by breathing, but I do not remember any previous instance of an amateur photographer taking his own portrait whilst asleep."

OUGHT TO BE PROUD OF HIM.—John Hawkey, a photographer of Cleethorpes, Grimsby, who was charged at the Grimsby County Police Court on Wednesday with a breach of the Sunday Observance Act on August 25, caused considerable amusement by the defence he made to the magistrates. He said he had never been interfered with in Lancashire, although he had committed the offence there at least four hundred times. He now told the magistrates that they could not convict him either by by-law or by moral law. The heaviest penalty they could impose was 5s., and the proceedings were taken under a mildewed Act of Charles II. In conclusion, he remarked, "I am one of the smartest young men who ever put foot into Lincolnshire, and you should be proud of me. One day I shall sit in the Council of Cleethorpes." The magistrates, who were greatly amused at the pompous manner of defendant, ordered him to pay a fine of 5s., with costs 5s. 6d.

News and Notes.

THE Empress of Germany is exhibiting 1100 photographs, all taken by herself, at the exhibition of photographs now being held at Berlin.

A DESTRUCTIVE fire occurred on Friday morning at Kingston in the studio of Messrs. Newton & Co., photographers, Fife-road, resulting in the complete destruction of the building. The Royal County Theatre had a narrow escape. The damage amounts to upwards of 600*l*.

THE winter series of weekly lectures, demonstrations, lantern shows, &c., will be inaugurated at the Croydon Camera Club Rooms on Wednesday, October 3, with an address by the President, Mr. Hector Maclean, F.R.P.S., which will be followed by a demonstration on "Recent Advances in Lantern-slide Making."

AN illustrated journal for showmen and all entertainers has just made its appearance under the title of *The Showman*. It appeals to those connected with variety shows, both travelling and fixed, roundabouts, nigger troupes, menageries, travelling museums, illusions and sleight of hand, phonographs, gramaphones, lantern and cinematograph exhibitions, &c. The first number contains an illustrated article on circus life by Mr. T. C. Hepworth, and another entitled "How War Films are Made." Reports of various shows and entertainments, illustrated descriptions of apparatus of interest to showmen, a column for conjurors, and a tabulated list of coming events are also included. *The Showman* is published at one penny monthly, at 15, Harpalley, Farringdon-street, London, E.C.

"THE war has supplied many remarkable cases of recovery from bullet wounds which were regarded as fatal," says the *Daily Chronicle*. "Not the least extraordinary is that of Trooper L. A. Palmer, of the Australian Horse. Nearly six months ago he was wounded in the head with a Mauser bullet, and, after a stay in various hospitals in South Africa was invalided to England. Last Tuesday week, at the University College Hospital, Mr. Horsley, the well-known surgeon, having taken a Röntgen-ray photograph of the bullet, which appeared to be imbedded in the brain, extracted it in the presence of an admiring audience. On Monday Trooper Palmer accompanied the Colonials to Windsor, and said he felt perfectly fit. Almost the only inconvenience he felt from the wound was a violent headache, which came on about ten days before the operation."

THE MOST INTERESTING PLANET.—"Jupiter is the most interesting planet of the solar system, considered as a subject for telescopic investigation; and he is certainly one of the easiest objects we have, on account of his large size and the conspicuous character of many of the markings he displays." So

rites Mr. Denning in the current number of *Knowledge*. "It is in the study of changes in the figure and motion of these markings that Jupiter offers attractions of a more distinct and special kind than those of any other planet. Venus is beautiful as a crescent, but her disc shows no more than mere suspicions of dusky areas, of which it is exceedingly difficult to trace the outlines or discern variation. Mars displays an interesting configuration, a reference to which we have still much to learn, but he is of small dimensions, and only visible to the best advantage at comparatively long intervals. Saturn exhibits a novel and picturesque effect, but his details are somewhat faint, and this, combined with his great distance and relatively small apparent diameter, has occasioned a good many dubious observations of late years. No doubt there are occasional irregularities in the belts, and definite spots now and then appear, for there is every reason to believe that the surface phenomena of the planet is somewhat similar to that operating on Jupiter, in 1878 and 1879, when the great red spot developed into striking prominence, and became an attractive object for study, the planet Jupiter was surveyed by nearly every telescope, and our knowledge of his phenomena was much enhanced. . . . The spots having considerable proper motion, and being subject to extensive changes, cannot be regarded as material parts of the planet's surface. . . . During the last few years Jupiter has received much further investigation. The red spot is still present, though only as a dusky tint in the bay or hollow in the south side of the great southern equatorial belt."

Commercial Intelligence

WE are informed that Mr. Ernest Human has severed his connexion with Mr. Walter D. Welford, and will henceforth carry on business on his own account as a manufacturer of cloud and border negatives, vignettes, &c. Developing, printing, and enlarging will also form a branch of this new business. His address is 50, Sheringham-avenue, Little Ilford, E.

THE Thornton Film Demonstration in the hands of Mr. Walter D. Welford commenced on Monday night at the Cripplegate Institute. There will be one to-night before the London and Provincial Association (White Swan, Tudor-street, E.C.), to which visitors will be welcomed. Mr. Welford asks us to state that he has some open dates in September which he would be glad to fill. His address is Warwick Lodge, 166, Romford-road, London, E.

Re WILLIAM LANDER, photographer, 1, Regent's-parade, Station-road, Shanklin.—The public examination of this debtor was held at the Newport, Isle of Wight, Bankruptcy Court, before Mr. Registrar Blake, on Monday. The statement of affairs filed by the debtor disclosed liabilities amounting to £159., and assets estimated to produce £17., thus leaving a deficiency of £92. Replying to questions put by the Official Receiver, debtor stated that he commenced business as a photographer at Shanklin in November 1897, in partnership with a Mr. Jolliffe, and they carried on business under the style of Lander & Jolliffe. Witness put 92% into the business, and his partner contributed 200%. They did not keep any banking account. They paid the former proprietor of the business 30% for the goodwill, negatives, &c., and 4% for the apparatus, &c. They both had a good knowledge of the business, and they devoted the whole of their time and energies to it. The partnership was dissolved in February of this year, when debtor agreed to pay his partner 150% as his share of the assets. Since then debtor had carried on the business alone. His wife claimed the furniture. The examination was closed.

THE AMERICAN MECHANIC.—Commenting on some of the more recent articles in the *Times* on "American Engineering Competition," of which the most striking observations are reproduced, *Feilden's Magazine* emphasises the contrast between the American working man, who is paid according to his merits, and consequently uses his utmost energy to produce the highest quality of work—as by so doing he not only benefits his employer, but himself—and the British workman, who demands the pay fixed by the trades union, and works no more than just enough for food and beer, takes no interest in his work, and stupidly but obstinately opposes the introduction of labour-saving machinery. "We have touched very lightly on this subject," says the journal, "but it is one whose importance cannot be over-estimated. Something has been done in this country to improve matters, but very little; and there are no signs of any great movement towards further organization on the part of the engineering employers. On every hand we see a growing tendency for municipal bodies to join the conspiracy against industrial prosperity by insisting on the trades-union labour clauses in all contracts. Occasionally we hear that members of the Engineering Employers' Federation are so wanting in good faith as to accept contracts in which such clauses occur. More than this, we have even seen a specification, drawn by the London agent of a firm associated with the Employers' Federation, in which the same pernicious clause was inserted. So long as apathy, jealousy, and sometimes disloyalty, continue to be the distinguishing features of employers, so long will the mechanic be the master of the situation. British employers, as well as British workmen, have still a good deal to learn from the United States."

Patent News.

THE following applications for Patents were made between August 20 and August 25, 1900:—

ANIMATED PHOTOGRAPHY.—No. 14,848. "Improvements in Apparatus for Projecting Animated Photographs on to a Screen." E. T. SAUNDERS.

BUSH AND TRIPOD TOP.—No. 14,980. "New Improved Bush and Tripod Top for Photographic Cameras." W. D. HAZELTON.

SPRING-BACK FOR FRAMES.—No. 15,140. "A Spring-back for Photograph Frames." W. GUTTENBERG.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
11.....	Hackney.....	Paper by H. W. Lane.
14.....	Croydon Microscopical	Conversational Meeting.
15.....	Bootle	Excursion: Ince Woods. Leader, C. St. C. Crawley.
15.....	Croydon Camera Club	Excursion: Hampton Court to Chertsey. Leader, B. E. Edwards.
15.....	Croydon Microscopical	Excursion: Fungus Hunt in Addington Woods.
15.....	West London.....	Excursion: Holland House.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 30.—Mr. S. Herbert Fry in the chair.

MR. WALTER D. WELFORD passed round some negatives on the new Thornton film, of which a demonstration had been arranged for the next meeting, when a discussion regarding its merits would be in order. In the meantime a general discussion upon the subject of films arose. Mr. Welford showed how the finished negative was stripped from its support, and, challenged by Mr. Henderson, replied that the film was quite different from the Secco film.

MR. HENDERSON found that the stripped negative was a gelatine film and affected by water, and that there was glycerine present, presumably to prevent the film from becoming too hard and dry. He did not think that P.O.P., with its free silver, placed in contact with a glycerine-treated film, would conduct to the best results, and said that stains would naturally follow.

MR. WELFORD testified, however, to the fact that practically there was no cause for the last speaker's alarm, as he had taken many prints from such films and without the disastrous results alluded to.

THE CHAIRMAN made references to the Wellington film and some recent trials he had conducted, especially with reference to the stripping operations, in which he had not been altogether successful. His own attitude towards films, he thought, was best stated in the following way: He took out a camera with several glass plates and several films and exposed them. The plates he was able to develop and print with ease and assurance; the films were not yet finished. He did not assert that the films were necessarily bad, but he found that they required the expenditure of an amount of trouble, and patience, and time not at all warranted by the results to be obtained. With Mr. Haddon he agreed that films would, for ordinary purposes, be always at a disadvantage until they were coated on a rigid surface, and this was particularly noticeable in the case of large sizes.

The suitability of developers for Wellington film other than pyro ammonia, which was specially recommended, was the subject of a short discussion. It was stated that almost any developer except pyro soda and those containing the caustic alkalies, were of use with the film.

MR. HENDERSON handed to the Chairman the enamel which Mr. Haddon had made and presented to the Association, nicely mounted in a leather case. Examined by daylight, he found that the heaviness of the shadows noticeable by gaslight quite disappeared. He thought the enamel was a very good piece of work. Mr. Henderson then introduced the subject of the difference in density between a wet and a dry film, reading some observations made by a friend in a letter to him.

MR. MACKIE agreed with Mr. Henderson that a plate was a little less dense when dry than when wet.

MR. HENDERSON said that this held good with plates that had not previously been dried after development, but not, he believed, with rewetted plates. His observations led him to expect a different result with intensified plates, which, he thought, would be found to dry more intense.

MR. H. C. RAPSON had examined plates of two different brands with reference to the same action. They were developed almost at the same time, washed together, and put in a rack to dry. One distinctly showed a thinning as drying proceeded, and the other got denser. The plate that seemed to be denser when wet had a highly glazed surface when dry.

MR. HENDERSON showed a glass plate from which the negative film had been partially stripped. The bare glass bore distinct traces of the image to be seen on the film, and Mr. Henderson humorously asserted that pictures might, in time, be produced in this way. The plate was a bromo-iodised plate. The negative had been made twenty years, and in the intervening period had been outside, knocking about as useless; during all this time the atmosphere and other influences had produced a species of engraving on the glass which it was impossible to get rid of.

MR. HADDON said that the plate was similar to that shown a month or two ago by Mr. Thomas. He ascribed the action then to a disintegration of the glass surface by moisture and carbonic acid, and he thought his statement was confirmed by this later example.

MR. J. S. TEAPE spoke of a similar thing noticed by him quite recently, in the case of a wet-plate negative which he stripped. The glass, when breathed upon, showed the image distinctly.

PHOTOGRAPHIC CLUB.

AUGUST 29.—Mr. J. W. Mason in the chair.

The following question was put to the meeting: "Is it possible to preserve a collotype plate, say, for a few years, and afterwards to recommence printing from it?"

MR. E. W. FOXLEE stated that, while he had never kept a collotype plate for a matter of years, he had for a few months. The keeping quality of collotype plates depended very much on how completely the bichromate had been washed out. The longer, however, the plate was kept the harder the film became, and it would want a lot of soaking before it could be again used.

Mr. H. SNOWDEN WARD said that it was stated by a certain firm connected with the collotype industry, that if the ink were entirely removed from the plate, after use, by means of turpentine, and the plate thoroughly soaked with water and allowed to dry in a current of air, it would keep for years, and could be again made ready for printing by treatment with water and glycerine solution. Amongst most collotype workers he believed the practice was to ink up the plate before putting it aside. He asked whether any present had ever seen a case of the glass surface being torn away by shrinkage of the gelatine film. He had seen such a thing, which, however, must be distinguished altogether from a separation of the film from the glass.

Mr. FOXLEE said it frequently happened if a plate were over-dried. He had shown plates here on more than one occasion of which the surface had been stripped in the same way. A collotype plate was ground first, and then coated with a substratum containing bichromate which was exposed to light through the glass. By this means a very hard quality was given to the film where it was in contact with the glass, and it had so strong a grip of the glass that it easily tore away the surface if, when the second coating had been applied, it was dried too much. The patterns produced were very peculiar. Soft gelatinates and brittle gelatinates gave patterns of different characteristics.

Mr. F. A. BRIDGE came across, some years ago, some thickly coated plates that had split the surface of the glass in a similar way.

The next question, "After pyro which is the best developer for plates?" was the source of much discussion. The question was defined by one speaker as an inquiry for the developer that would give the best results under the widest possible range of circumstances. Kachin, ortol, ferrous oxalate, and many other well-known developers were mentioned during the debate, not as supplying the answer to the question, but for certain characteristic good qualities. It was asserted that in France photographers continued to use ferrous oxalate for a long time after the introduction of pyrogallol, and this seemed to point to ferrous oxalate as a very reliable developer.

Mr. FOXLEE said that in Munich, so recently as 1897, photographers were still largely using ferrous oxalate.

Mr. BRIDGE supposed that this would be under certain given conditions, such as for copying or for studio work.

Mr. FOXLEE added that Mr. Witcombe, of Buenos Ayres, until recently used the ferrous-oxalate developer for all his work.

Mr. BRIDGE mentioned that, in pyro development, action could often be hurried up a little by the addition of a trace of metol powder. As regards the alleged impossibility of tinkering with the ferrous-oxalate developer, he could only say that it was not the case, and a great deal could be done to modify its action.

Mr. G. E. BROWN said he had recently spoken with Mr. V. C. Driffield upon the question of development. Everything that Messrs. Hurter & Driffield published they held to the last, and Mr. Driffield still held this to be strictly true. He said that one could not tinker with one's developer and calculate previously what one would get, that is when the tinkering was done by the addition of other substances to the developer; whereas, if one used a plain developer such as pyro soda, without bromide, one could calculate exactly the density for a certain definite exposure. Mr. Brown was shown a plate on which were three patches of different densities, one clear glass, one medium, and one quite dense. Mr. Driffield challenged any photographer to expose a plate behind that plate, and by suitable exposure to produce therefrom three patches of equal density without trial. He claimed he could do this by attention to the photo-chemical laws laid down in their writings. It was true that one might know in which direction tinkering might make our results tend, but one cannot control the amount, whereas with a bromideless developer one could absolutely calculate what alterations one was going to make in the gradations.

Mr. BRIDGE thought it was once more a case of theory *versus* practice. Supposing he wanted to produce a certain result, tinkered for it and got it, how did that conform to Mr. Driffield's assertion? As a practical man he asked, Why calculate? He never had difficulty in getting the result he wanted. The fact that the same thing could be done by calculation was no proof that it could not be done in any other way.

Mr. H. MÜLLER agreed that, while a scientific explanation of facts might be very desirable, it was unreasonable to think that it was the only point from which a phenomenon could be looked at and studied.

Mr. BROWN added that Mr. Driffield was, in the first place, an amateur before he commenced his researches with Dr. Hurter. His particular bent was portraiture; this was in the collodion days and he sensitised his own plates. He knew their speed and the exposure required. When gelatine plates came in they were very irregular in point of speed, and there was no means of telling the exposure, so the well-known series of experiments were made entirely for themselves.

Mr. BRIDGE confirmed the statement regarding irregularity of speed with early gelatine plates. The gelatine was in itself so variable a factor, that much of the want of uniformity might be attributed to this.

North Middlesex Photographic Society.—August 27, Mr. J. Austin Keen in the chair.—Mr. F. C. TILNEY gave a lecture entitled,

ROSSETTI, PAINTER AND POET.

A most interesting account of the life and works of this artist was given by the lecturer, who was evidently well up in his subject. He had a great number of reproductions of the artist's works on view, and the explanation and description of them made the audience feel that they would understand and appreciate better the originals when they saw them. A number were illustrations of the artist's own poems, extracts from which were quoted when they helped to explain the picture. Rossetti, with Millais, Holman Hunt, and the sculptor Thomas Woolner, founded the Pre-Raphaelite Brotherhood, which exercised an enormous influence upon the art of the day, which was in a very low state. The strong point in his paintings was colour, which was extremely glowing and rich.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—A meeting of the Newcastle-on-Tyne and Northern Counties' Photographic Association was held on August 21 in the Mosley-street Café, Newcastle, to consider the question of the secretaryship, Mr. William Thompson having been obliged, with much regret, to tender his resignation as Secretary, owing to the recurrence of ill health. Mr. W. S. CORDER (Vice-President) was in the chair, and said they all deeply regretted that it should be necessary, because of Mr. Thompson's ill health, to appoint a new Secretary. He (Mr. Corder) had had a good deal of work to do in connexion with the Society during the last twelve months, and it had been the greatest pleasure to work with Mr. Thompson. He had the interests of the Society at heart, and had done an enormous amount of work on behalf of the Society. In fact, one feared that his illness had been to some extent accelerated by the work he had done for the Society. It was agreed, on the motion of Dr. Blacklock, that Mr. Corder should write to Mr. Thompson, stating that the Society had accepted his resignation with regret; that they appreciated the able service he had rendered to the Society, and sincerely hoped that his health would soon be restored. After some discussion, Mr. Edgar Lee consented to go on acting as Assistant Secretary until the annual meeting, Mr. Corder and Mr. T. M. Clague undertaking to assist him. The meeting cordially agreed in this arrangement. The CHAIRMAN explained that it was proposed, on behalf of the Society, to present a silver stop-watch to Mr. Thompson, and some pieces of silver to Mrs. Thompson. Mr. and Mrs. Thompson were married only this summer, and they were all extremely sorry that Mr. Thompson, for whom they had a sincere affection, should have been so ill. The watch and the silver cream jug and sugar bowl were handed to Mr. James Baty, who undertook to convey them to Mr. and Mrs. Thompson.

FORTHCOMING EXHIBITIONS.

1900.

- Sept. 21–Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- October 1–Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- 17–20 Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.
- November 7–10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
- 12–17 Ashton-under-Lyne.
- 21–23 Hackney Photographic Society.
- 22–24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.

1901.

- January 14–19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE SALE OF POISONS.

To the EDITORS.

GENTLEMEN,—I enclose a cutting from the *Gardener's Magazine* of the 25th ult. It may be of interest to your readers, as it shows that photographers are not the only prey of the Pharmaceutical Society. Perhaps some of the dealers most interested might be glad to know of the Society formed to combat the pharmacists' tyranny.—I am, yours, &c., Lewin Cottage, Lewin-road, Bexley Heath, Kent. G. C. LAWS.

TRADE IN POISONS FOR TECHNICAL PURPOSES.—The Traders in Poisons or Poisonous Compounds for Technical or Trade Purposes Protection Society have taken offices at Nos. 5 and 6, Clement's Inn, Strand, London, W.C., and the Committee have appointed Mr. T. G. Dobbs Secretary of the Society; Mr. G. H. Richards, of 128, Southwark-street, London, S.E., Hon. Treasurer; and Messrs. Dobbs & Hill, legal advisers. A strong representative committee has been formed, and the Society is now seeking support by way of subscriptions or donations from all classes of traders, the objects of the association being

stated shortly as follows: (1) To promote and protect the interests of traders in poisons and poisonous compounds for technical or trade purposes; (2) to take steps, as the Executive Committee may consider desirable, for opposing legislation which is calculated to injuriously affect such traders; (3) to secure the removal of repressive and vexatious restrictions in regard to the sale of poisons and poisonous compounds for technical and trade purposes by traders other than pharmacists; (4) to promote and support by all constitutional means the passage through Parliament of any Bill or Bills comprehending the above objects; (5) to advise and assist members of the Society in any litigation in which the general interests of the traders in poisons and poisonous compounds for technical or trade purposes are, in the opinion of the Executive Committee, injuriously affected.

[The Order in Council with regard to the sale of carbolic acid provides that, in future, all liquid preparations of the acid containing more than three per cent. of the poison can only be sold retail by registered chemists and druggists. Preparations containing carbolic for use as sheep-wash, or for agricultural and horticultural purposes, are excluded from the Order. Every vessel used must be labelled with the word "Poison," the name of the article, and the name and address of the vendor. Further, all liniments, embrocations, and lotions containing carbolic acid must be sent out in bottles rendered distinguishable by touch, and bearing a notification that the contents are not to be taken internally.—EDS.]

THE PARIS EXHIBITION.

To the Editors.

GENTLEMEN,—We have pleasure in informing you that the Actien-Gessellschaft für Anilin-Fabrikation, Berlin, for whom we are sole agents in this country, have been awarded the gold medal at the Paris Exhibition for their photographic preparations.—We are, yours, &c.,

A. & M. ZIMMERMANN.

9 and 10, St. Mary-at-Hill, London, E.C., August 31, 1900.

THE R.P.S. EXHIBITION.

To the Editors.

GENTLEMEN,—I should be glad if you would kindly remind your readers that the last date for the reception of exhibits, packed in cases, intended for our forthcoming Exhibition, is Tuesday, September 11. Exhibits delivered by hand will be received at 66, Russell-square, until eight p.m. on Wednesday, September 12. Prospectus and entry forms can be had on application.—I am, yours, &c.,

A. W. W. BARTLETT, Assistant Sec.

Royal Photographic Society, 66, Russell-square,
London, W.C., September 1, 1900.

THE "PHOTO-MINIATURE."

To the Editors.

GENTLEMEN,—May we point out that your answer to a correspondent on p. 560 of the current issue may mislead him as to the price of the Photo-Miniature. Though the American price is 25 cents (the equivalent to 1s.), the English edition is sold at 6d. per copy, post free 7½d., and it can be obtained from most dealers in photographic materials.—We are, yours, &c.,

DAWBARN & WARD, LIMITED.

6, Farringdon-avenue, London, E.C., August 30, 1900.

THREATENING A RIGHT.

To the Editors.

GENTLEMEN,—A lady came and engaged me to photograph a certain public-house. I went, and the tenant objected, in fact, incited many people to obstruct the views I took as much as possible. I asked the publican the reason for his objection, and he said the lady had no right to have the place photographed, and she wanted the photographs to object to his licence. She had no claim at all upon the property. He also said, if I published the photographs at all, the Licensed Victuallers' Association and the owners of the property—a brewery company—would prosecute me for doing the same.

After thinking it over, I decided my best course was not to go on with the photographs, as both owners and tenants objected, and she had no pecuniary interest in the matter. I told the lady so, and offered her the deposit she had made, viz., two shillings. She refused it, went to a solicitor, from whom I received a letter stating he knew all the facts of the case, and I need not be afraid of proceeding with his client's order; also, that if I refused I should be held liable for damages for breach of contract (not a written one, only a verbal one).

■ I have already suffered to a slight extent. The place is a small one, and I must not set popular feelings against me. Will you kindly advise me through your columns if there has been a similar case to mine, and also how I stand with regard to the bad business.—I am, yours, &c.,

COMPLETION OF ORDER.

[Let not our correspondent be perturbed. He has a perfect right to photograph the public-house, and not all the publicans, Licensed Victuallers' Associations and brewing companies in the kingdom can stop him. We cannot recall a case bearing on the point, but we advise him to execute the order and ignore the ridiculous threat of "prosecution."—EDS.]

A NEW LIGHT FOR THE STUDIO.

To the Editors.

GENTLEMEN,—Already the signs are appearing of the approach of winter, with its dark days and long evenings, and with it comes the demand for a satisfactory artificial illuminant which, with a minimum trouble and cost, will make the professional photographer independent of daylight. Recently I was invited to inspect a new light, which fulfils the above conditions so well that it is almost a duty to bring it before those who are interested. Its characteristics are simplicity, cheapness, safety, great brilliance, and extraordinary actinic power. Briefly described, the burner is after the style of the Welsbach, with mantle but no chimney. The combustible gas is simply atmospheric air, driven, by means of a small fan, through a saturator, or carburiser as it is termed, and burns with a non-luminous but intensely hot flame, which raises the mantle to a dazzling brilliance approaching limelight, but more diffused, and consequently softer. The fan which I saw was driven by a diminutive motor connected with the street electric supply.

To demonstrate the actinism of the light, some three-quarter length cabinet portraits were taken in a white-washed cellar, from which daylight was excluded. The exposures were from five to seven seconds, with three burners in a row, and one on the opposite side, on a Barnet medium plate, stop f-11·3, and were pronounced by a professional photographer to be daylight portraits. (I enclose one for your inspection). Furthermore, a P.O.P. print was made in twenty minutes, at about six inches from the burner.

The same gas can be used as a motive power for gas engines. In this case no fan is required, the engine drawing the air through the carburizer by its own suction. A three-quarter horse engine was connected by a rubber pipe to a diminutive saturator, about the size of the smallest calcium tubes used for storing platinum paper, and it was ludicrous to see the fly-wheel spinning madly round at the instigation of an old tin canister, without reservoir or gasometer. As the inventors point out, there is no danger of escape or explosion, there being nothing to escape. Directly the air supply is stopped the production ceases. The appliances are so simple that I should imagine a perfectly efficient studio installation could be fitted up for a 10/- note or so. By way of showing how easily a photographic light could be produced for occasional use, the tin canister thing was coupled on to a burner, and air blown through by a rubber ball with a sixpenny balloon between. For the lantern it should be eminently suitable, and, by reducing the area of light by a diaphragm, an ideal illuminant for the enlarging lantern.

I may add that I am in no way connected with, nor interested in, the invention. I believe it is patented here and abroad, and a private Company to be formed. Any one interested can obtain further information by applying to the Atmospheric Gas Company, 5 New Bond-street, Leeds, who would, no doubt, be willing to allow practical tests with the camera.—I am, yours, &c.,

A. A. PEARSON.

21, New Station-street, Leeds, September 3, 1900,

[We are exceedingly obliged to Mr. Pearson for his interesting letter. The photographs sent certainly favour the system of lighting referred to, for they are characterised by softness and evenness of illumination. If our Leeds friends can favour us with any further particulars, we shall be pleased to publish them.—EDS.]

THE PHOTOGRAPHIC SALON, 1900.

To the Editors.

GENTLEMEN,—I shall be obliged if you will kindly notify in the current issue of your paper that entries for the Photographic Salon close September 10.

Pictures, accompanied by Entry Form, may be delivered by hand at the Dudley Gallery, Egyptian Hall, Piccadilly, London, W., on that day, between 10 a.m. and 9 p.m., or may be sent by September 6, marked "For the Photographic Salon," to Mr. Moore, Manager of Messrs. Whiteley's Shipping Department, Queen's-road, Bayswater, London, W., who will attend to their delivery.—I am, yours, &c.,

REGINALD CRAIGIE, Hon. Sec.

Camera Club, Charing Cross-road, London, W.C. Sept. 3, 1900.

Answers to Correspondents.

* * * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:

C. H. Skillman, 22, Uxbridge-road, W.—Photograph of Mr. J. Bailey.

PUZZLED READER.—The context shows the meaning, viz., a distance experimentally ascertained.

W. H. H.—Without seeing a specimen, we cannot assist you. Send us an example of the trouble, and we can, no doubt, help you, which we shall be pleased to do.

BLACKENING BRASS.—H. KELLETT. The reason the black is uneven on the surface is that the metal was not evenly clean all over. The best way of cleaning is with very fine emery cloth such as is sold for watchmakers' use. The blackening solutions you have employed are all right.

FANCY GOODS.—CATALOGUE writes: "Will you please give me the address of two or three firms where I can purchase fancy goods of every description suitable for photographer's shop?"—In reply: Messrs. Marion & Co., Soho-square, probably supply the kind of goods required.

P.O.P.—NOVICE asks, which of the many P.O.P.'s that are being advertised as the best we would recommend him, as a beginner, to use.—It is quite against our rule to recommend any particular maker's wares. All the recognised brands are good. We should recommend our correspondent to get a sample sheet of different brands, and decide for himself which he likes the best.

EFFECT OF ALUM ON P.O.P.—P. LLOYD writes: "Will you inform me if P.O.P. prints put into a solution of alum, after fixing to harden gelatine, would cause fading of the prints if they were well rinsed?"—If the hyposulphites are perfectly washed out before the prints are put into the alum, and the latter is removed by washing, the permanence of the prints need not be impaired.

STUDIO BLINDS.—R. C. says: "I have just taken premises, and the studio is a lean-to, built against a high wall facing N.E. I shall have to fit it with blinds of some sort. Will you please say what would be the best material and colour?"—With that aspect, we should suggest either a tolerably dark blue or a light green. Either would answer quite well, and would be a very agreeable colour to the sitter. The usual window holland would be a good material for the purpose.

RIVAL PHOTOGRAPHERS.—XENO. "I enclose a circular that another photographer is sending about in this district, to the great disparagement of my work, as well as my character. I was formerly in his employ, but am now on my own account. Can I stop him?"—We should say that you certainly could. It is libellous, and shows a great amount of malice. Not only can you stop him, but we expect you can recover damages. Put the matter in the hands of a solicitor without delay.

RETOUCHING WITH A NEEDLE.—W. MARSHALL writes: "Will you tell me what tools are required for retouching with a needle? 1. Whether you can get any special needle, and from where? 2. If medium is used; if not, what is used?"—We believe that most retouchers who work in this way simply use a needle forced in the stick of a penholder or similar contrivance. Very possibly Messrs. Marion & Co. sell needles specially for the purpose. Inquire of them. No medium is required.

COLOURING ALBUMEN PRINTS.—H. T. HILLHOUSE writes: "I want to colour some albumen prints which are pasted in an album, but find water colour does not properly adhere to same, and there is great difficulty in getting same to take. Will you please tell me what to coat the prints with so that I can easily work on them?"—If the surface of the prints be washed over with a little oxgall very much diluted with water, the colour will take readily. Prepared oxgall may be had from any of the artists' colourmen.

DAMAGED LENS.—R. SIMMONDS says: "I have accidentally let my half-plate R.R. fall, and it has caused a slight chip in the back glass. I don't know who the maker is, as there is no name upon it, so cannot send it to him to do the needful. What should I do?"—Simply put a little black varnish on the chip to prevent reflection from it, and you will find that no material injury has been done. Theoretically, the lens will be a very little slower from the slight loss of light, but it will be quite a negligible quantity.

PERMANENCY OF COLLODIO-CHLORIDE PRINTS.—H. G. M. C. asks: "1. Can you tell me whether collodio-chloride prints are fairly permanent? 2. As compared with albumenised paper, if treated with the same care, are they more or less liable to fade and become yellow?"—In reply: 1. Properly prepared collodio-chloride prints should be as permanent as a photograph can be. One great advantage of the process is the chemical inertness of the vehicle. 2. We should ascribe fading or yellowing to imperfect manipulation.

PAPER FOR BACKGROUNDS.—J. A. FOX writes: "I have seen brown paper recommended for backgrounds. Can you tell me where it is to be had in sheets large enough for the purpose without folds? None of the stationers here have any nearly large enough, and what they have is folded in the middle."—The paper may be had of almost any length, and about five feet wide, under the name of "carpet paper." It is not usually kept by stationers, but by furnishing warehouses, and is used for putting under carpets when they are laid.

TRAVELLING EXPENSES.—OPERATOR says: "I accepted an engagement for the season at a Scotch watering-place, and the railway fare (third class) was nearly two pounds. Who should pay that? On asking for it when I received my first month's salary, I was told that I must bear that expense. Will you please tell me what is the rule in such cases?"—So far as we are aware, there is no rule, it is simply a matter of arrangement at the time of making the agreement. Usually the agreement is for the employer to pay the fare one way, that is when an agreement is made.

MATERIAL FOR BACKGROUNDS.—GLOW writes: "I have often read that some of the best photographers use special backgrounds to suit different sitters, particularly for vignettes, which they hastily prepare for themselves. Will you please tell me of what material they are made of, as it seems to me that canvas strained on frames cannot be used for the purpose?"—Brown paper, which may be had in rolls up to about five feet wide, under the name of "carpet paper," is very suitable for the purpose, as it forms an excellent ground colour, and may be readily lightened or darkened where desired with powder colour rubbed on.

TROUBLE IN CARBON PRINTING.—W. LOWE writes: "I am in trouble with carbon printing. The trouble is this: I cannot get the exposed tissue to adhere to the flexible support, or to the single transfer paper. I have tried soaking it for all times, but with the same result. I have squeegeed it well, and even kept it screwed down in a copying press for half an hour; and when I took it out, and put it in the warm, the tissue at once came clean off the paper. Can you explain why?"—In all probability the tissue has become insoluble. Place a piece of it in warm water (unexposed, of course), and, if the colour does not begin to dissolve in a minute or two, it is insoluble, and that accounts for the trouble at once.

INDIARUBBER MOUNTANT.—RUBBER writes: "I recently saw in an old book that indiarubber solution was excellent for mounting photographs with. Now it has occurred to me that, as there so many bad mounts in the market, that this would be the best thing to use. As the indiarubber is waterproof it would protect the print from the injurious matter in the mount. As I have a lot of mounts that I am suspicious of, will you please tell me how the rubber solution is made?"—Simply dissolve the rubber (unvulcanised) in benzole. The best way is to get some of the thick solution, as sold at the indiarubber shops, and dilute that with benzole; it will save trouble. The objection to indiarubber as a mountant is, that after a time it is liable to perish, when the print will leave the mount.

OVER-EXPOSURE.—PRINTER writes: "I took a photograph of a view of this town, from a distance of 200 yards or so, using stop f-32 and one second exposure, on whole plate. I mixed developer for a plate that would be expected to be over-exposed. I may say the sun was shining. On developing, the plate was rather a long time coming out, and I could not get sufficient contrast even in the sky. There was an abundance of detail, and some of the objects were even more dense than the sky. I used pyro-soda developer, with plenty of bromide of potassium. It was taken on Barnet ordinary plates."—Apparently the negative was considerably over-exposed, as you surmise. But what do you wish to know about it? you put no query. Possibly, if it were intensified, you might get fair prints from it.

SPOTTED NEGATIVES.—FAULTY PLATE writes: "Would you kindly inspect the enclosed negative, and if possible inform me what these spots are due to? I do not notice them when they are fixed, but soon after starting them to wash they appear. Is it any fault of mine or the plate, as it is only on quarter-plates that they come? I developed whole-plates, half-plates, and quarter-plates last night, and this morning nearly all the quarter-plates are spotted similar to enclosed; some not very much, others are unprintable. It has only appeared this last few days, and, having had some new plates in, I fear it is a fault of the maker, but I should like to have your esteemed opinion first. I have had splendid results with them up to now."—In reply: We should be inclined to suspect the water you use for fixing and washing; if it contained traces of iron or other impurities, it would produce similar markings. Filter the water through flannel; this should intercept all solid particles and prevent such markings.

THE FERROTYPING PROCESS.—A. E. D. writes: "Would you kindly let me know how to proceed with the ferrotyping process, wet plate? Quantity of iodiser with collodion, if it is to be any different according to hot or cold atmosphere? Quantity of nitrate of silver (recrystallised), how long plate to be in bath, and what developing formula will you advise for quick exposure, say, one to three seconds in shade summer and winter, and what fixing bath? I have lenses f-8. I am working the dry-plate process, not the ferrotyping plates, only I should like to know how to proceed with ferrotyping wet plates?"—All the formulæ for collodion, bath, developer, and fixing solution, are given on pages 1088-9 of the ALMANAC; but we should advise you to purchase the collodion ready made, as then you will ensure getting a good one. As you are, apparently, quite unacquainted with the wet collodion process, we should recommend you to get an old manual of photography. In that you will find full working details of the glass positive or ferrotyping process.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

The fortieth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1516 pages, and, as was the case in 1899, the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1901. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

MESSRS. CARL HENTSCHEL, Limited, of 182-4, Fleet-street, E.C., send for our inspection a specimen sheet which they are just issuing of the Carl Hentschel Colourtype process. Messrs. Hentschel's accompanying letter may speak for itself: "We believe this sheet is the largest yet issued of an artistic character, and we would draw especial attention to the variety of subjects treated. There are examples of oil and water-colour paintings, as well as reproductions taken direct from an old book cover, and a delicate Royal Worcester vase. With reference to this process, which differs from any other, we might add that we have reproduced a number of medical and natural-history subjects with the best results. Several of these difficult objects had been attempted abroad, but without success. We contend that the Carl Hentschel Colourtype

process is as useful for the delicate illustrations required in medical, surgical, and scientific books of reference as it is for the child's picture book, now so largely reproduced by lithography, often to the complete destruction of the artist's scheme of colour, while for books of travel and tales of adventure it will be found most attractive. The process is also equally applicable to commercial subjects, facsimile reproductions of large originals, as magazine insets or leaflets for distribution are capable of being reproduced by the million at a cheap rate."

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WE have conceded to Messrs. Hentschel the privilege of speaking their own mind in this matter as some reward for their well-known enterprise, and not because we agree with all that they say. The sheet of pictures sent us measures 28 x 20 inches of subject. This is not by any means the largest yet issued, for we possess larger specimens by the same, or, at any rate, a very similar, half-tone colour process, and just as good. Again, we are bound to query the statement that the Hentschel Colourtype process "differs from any other." We have followed three-colour work for a good many years, and we should like to know the points of difference between the examples before us and others that have preceded them. Let it be understood that we make these remarks in no carping spirit; we rather wish to suggest that Messrs. Hentschel, an excellent process house which is comparatively new in the field of three-colour work, are inclined to overweight themselves with unnecessary and inconvenient claims. As to the sheet of specimens before us, we must say that we have not seen more beautiful specimens of the kind of work. In particular, Mr. T. B. Hardy, the well-known water-colour artist, should feel highly pleased, for the reproduction of his view of Rye, Sussex, gives us the impression of being perfectly true to the original. But the whole sheet of specimens is remarkably beautiful, and, if three-colour work so good as this is obtainable in the ordinary way of trade, we shall be quite satisfied; and we shall also be surprised.

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IN the JOURNAL of June 1 last we reviewed a book on Burma by Max and Bertha Ferrars. It is published by Messrs. Sampson Low & Co., and the 455 illustrations it contains are from the author's photographs. On the latter point we penned the following remarks: "For ourselves the immediate interest of the book centres round the fact that it is illustrated by considerably over 400 phototypic reproductions from photographs. When a book is illustrated in this manner, one of two things usually happens: either the original photographs are bad, or, if they are good, the reproductions are not. Frequently both are poor. In the present case neither the one thing nor the other happens. The original photographs, it is obvious, were marvellously good, and they have not only been well reproduced by the Swantype Company, but are flawlessly printed. In the whole of our experience we have not come across a book so well illustrated by means of photography as is this fine work on Burma. After many hours spent in its study we are left regretting that no explanatory preface is given." It is a pleasure to us to learn that Mr. Max Ferrars, the senior author, proposes to make public the system of working by which he produced the wonderfully good technical work that we admired in his book. He is to lecture on the subject at the Photographic Club, Anderton's Hotel, Fleet-

street, on Wednesday evening, September 19. The meetings of the Club are open to visitors, and those of them who take advantage of the Club's hospitality should have an instructive evening. *Burma* is one of the finest books of the year, and a great deal of its value is due to the excellence of its phototypic illustrations.

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AMONG the things noticeable during the great summer exodus from town, seaward or elsewhere, is the evident favour with which the *voyageur* regards a hand camera as an addition to his portable belongings. Men and women who scarcely ever at other times care to trouble about exposing plates seem to fly to photography as an eminently suitable holiday pursuit, which it undeniably is, though perhaps professionals, to whom there art possesses no magic glamour, but rather a tiresome every-day monotony, may not regard it in such a light. A photographer of some repute was asked the other day, whether he intended to take a camera with him during his annual sojourn by the sad sea waves. "No fear!" was his emphatic reply. "When I go for a holiday, I mean to leave such things behind." There is a good deal of sound sense in his resolution if we ponder it a little. Perhaps we should not hear of so many premature breakdowns among the ranks of our young enthusiasts if a little more of the true holiday spirit were exhibited. One can have too much of a good thing, even of the production of "pretty" negatives. The man who makes the camera his life companion by necessity is, perhaps, well advised to leave it behind him in those none too frequent intervals when tired humanity courts rests and recreation.

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To the ordinary amateur, or *dilettante*, none of these words, of course, apply, and, as we are saying, certainly one of the most striking facts of to-day is the popularity of the camera as a holiday adjunct. Seaside photography, however, is singularly barren of results, at any rate in inexperienced hands. Of all the thousands of plates exposed by our amateur friends on wave and ripple, breaker or looming storm cloud, how very few seem to have repaid the taking! Perhaps it is that unfamiliar conditions of light and subject deceive the novice and lead him astray, or it is that, beautiful to the eyes and romantic to the senses as the azure sea may be, it is photographically commonplace and uninteresting, having its subtle beauty more in colour than in form? Certain it is, without undue dogmatism, that the most successful seascapes have been those in which shipping, maritime surroundings, or weather-beaten fishermen have formed the principal objects; while landscapes seem, as a rule, rather to suffer than to gain by the presence of figures or accessories. The evidence seems to force us to the conclusion that the sea, however mystery-laden and beautiful, is, taken by itself, subject rather for the painter and the poet than the photographer. Many are the difficulties that beset the tyro who undertakes sea photography. One of the greatest is, of course, that of exposure. The actinic value of the light round the coast is so remarkable, compared with what he has been used to in town, even on the brightest days, that some allowance may surely be made for him when he tells the old tale of flat and lifeless negatives. Nothing but experience and a penitent recollection of past failures can give that sureness and correctness of exposure which is the ambition of every worker. It may be said, without much fear of contradiction, that marine subjects are best attempted in a comparatively weak light, as, for instance

ust after dawn or near sunset, or when gloomy cumulus clouds reign supreme over the sky. This, needless to say, does not apply to studies of shipping or the inevitable tar-paulin-clad seaman, where we must follow the old rule of exposing for the shadows.

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THERE is necessarily a great lack of seriousness about holiday photography that goes against truly satisfying results, or, as most of us very well know, ideal pictures are not the invariable product of light-heartedly "pressing the button," and trusting to good fortune for the rest. It is too much to expect the man who is down for the sole purpose of basking in the sun, and inhaling contentedly the health-laden fragrance of the seaweed-scented air, free, meanwhile, let us hope, from every worry and vexation; it is too much, we say, to expect him to take any very great pains with anything. There is a large body of men, however, who do take seaside photography seriously of necessity. We allude to the industrious army of "tintype" workers, who form so familiar a feature in any populous watering-place. What photographer, be he professional or amateur, can avoid a lurking feeling of sympathy with them, as he watches them trying to beguile the newly arrived tripper into patronising their *al-fresco* studios, with their carpet of sand or shingle, their roof the sky, and their only background some well-worn white sheet, dexterously kept in motion by an assistant? They are not society lights, these sand portraitists; half of them, perhaps, never even heard of the theory of development or the properties of an isochromatic plate. They can hardly be considered as shedding much lustre on their chosen profession, either individually or by their work, of which latter the less said the better, and yet, to some of us at least, there is a strange, unaccountable fellow-feeling for these distant photographic relations of ours that often checks our smile at their painfully inartistic productions, and, maybe, even prompts us to give them a sitting, though the resulting portrait be evermore anathema. But why this sense of complacent superiority? We are too apt to forget the comparatively recent expansion of our art, and that, in its infancy, results little, if at all, better than those of our comrade of the beach were hailed with admiring enthusiasm.

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AMONG the little drawbacks of the summer visitor's work at the seaside must be considered the very often far from satisfactory dark-room accommodation. Those who have had much experience in that direction will unhesitatingly bear out the statement that quite a large proportion of the rooms in which they have had to change their plates during holidays could hardly be considered safe. Where any doubt exists, it is far better to wait till it is dark, and change "by touch" in one's own room, which, with one or two simple and obvious precautions, is perfectly free from danger. We know one who always adopts this method, having a vivid recollection of the complete loss of a week's exposures through, as afterwards ascertained by experiment, a light-struck dark room. So much for indoor troubles. A frequently very grievous outdoor one is the truly extraordinary amount of dust and grit, blown about by the ocean breezes, settling on our lenses, and trying hard to prevent our shutters from working, if any of the mechanism happens to be outside. An occasional gentle

dusting with a very soft camel's-hair brush will repay itself, while a separate one might be retained for the lens, and never used for anything else. Another evil to be laid to the account of the inevitable sea-wind is the liability of its moving the camera. When it is blowing "half a gale," quite an every-day occurrence, the avoidance of motion becomes decidedly difficult, if not impossible, except with heavy apparatus, which, of course, is not often taken on a holiday. To be sure, a slight and almost imperceptible movement is often of no ill effect, with the extremely rapid exposures generally used. Still, it remains true that many a plate is spoilt from that cause alone, and that desirable views are often impossible to take on account of the high wind. When it is considered that it is just at the very time when the breeze is roughest, and steadiness of hand most improbable, that the sea is at its best, pictorially speaking, the infrequency of satisfactory seascapes being secured becomes less remarkable. It must also be remembered that the finest seas are not only during the breeziest days, but are also closely connected with dull, if not stormy, weather. Bearing in mind, then, the many obstacles to success which harass the photographer in his attempts to secure permanent reminders of some of the ever-changing ocean's many aspects, we shall be disposed to render due credit to the numerous really excellent pictures that continue to be offered to our notice at exhibitions and elsewhere. We are perhaps too apt to pass them by in favour of some superficially attractive landscape that strikes us momentarily by its novel lighting or composition, but which probably cost its producer not half the trouble and ingenuity freely expended on the neglected seascape. When apportioning our praise or blame to any work of the camera, a fair estimate is only obtained by taking into consideration the difficulties incident to its production. We have, it is hardly necessary to say, not the least intention of calling a picture good merely because it was hard to obtain. Like everything else in this critical and keen-sighted age, it must first stand or fall on its merits.

STUDIO-BUILDING.

As our Answers to Correspondents columns testify, the questions of, perhaps, all others that we are most frequently called on to reply to are those bearing upon the designing and building of studios. Some of the queries are, in varied language, so frequently repeated that we might almost keep a stereotyped block of replies. We propose on the present and succeeding occasions to bring together a number of considerations more or less applicable to these queries, and to point out the bearing of general principles upon their treatment. The point upon which information is most frequently asked for is the proportions of the studio—length, breadth, height. Where space is restricted to a given confined area, the question almost answers itself; but, where considerations of cost are the only governing principles, the builder may be supposed to have a fairly free hand.

First, as to length of studio. It must be taken for granted that at least such space must be included as will permit of the taking of cabinet full-length portraits. This is a question purely of lens and perspective. The lens-makers' catalogues all give instructions as to the distance required between lens and sitter for each lens when cabinets are to be taken.*

* See also table on page 1087 of the ALMANAC for 1900.

Usually two or three lengths of foci are given, requiring respectively from fourteen to twenty feet between lens and sitter. It will be found, however, that if a smaller distance than eighteen, or, at the outside, seventeen, feet is chosen, the perspective will be so exaggerated—the floor appearing to slope upwards, and the slightest prominence of hand or foot producing these parts in huge proportion—that the result will be eminently unsatisfactory. This result, it may be pointed out, is purely a function of the focus, and has nothing whatever to do with the quality or make of lens.

Let us, then, assume that a distance of eighteen feet is required. This does not mean a studio eighteen feet long; allowance is to be made for length of camera and for space behind it to work in. Two and a half feet for these spaces is a minimum. Then, at the other end of the studio, the sitter's end, as it is impossible to put him right against the background, a further allowance to permit of the occasional use of a head-rest or the projection of accessories must be made, and this cannot safely be put down at much less than three feet—addition from the two ends, five or six feet; total length, twenty-three or four feet, for taking cabinet full-length portraits with comfort.

But this is only part of the story. Good lenses are costly, so that the photographer might not actually, in all probability, possess more than one cabinet lens, and, if a group of people had to be taken, the lens would have to be retired for a considerably greater distance than eighteen feet, as much as eight to ten feet being necessary for, say, a group of a dozen figures. This brings us to a studio length of thirty feet, a distance which will not permit of much reduction by grouping the figures in two rows, one behind the other, for the front figures would be so much larger than the back if the camera were approached too closely to the group.

In taking groups it needs no argument to point out that the farther the camera is removed the more pleasing the proportion of the various sitters composing the group. Hence, in most respects, a studio longer than thirty feet would be advantageous from a purely optical point of view. That, however, is not the only point; a very important one has to be taken count of, that is the atmosphere. In summer time it is of little importance, but when autumn or winter, with their accompanying frequent fog and smoke approach, experience teaches that, too frequently, foggy, muddy pictures result if there be much space between sitter and lens. The result is that at such times excessive length of studio is a drawback, and, if groups, and sometimes, even, full lengths, are taken at all, it will be wisdom to use a special shorter-focus instrument and risk the evils of exaggerated perspective rather than produce photographs of indifferent appearance through fog.

The foci of lenses and the length of studio being subjects so completely intertwined that they cannot be separated in treating the latter, it will be useful at this stage to enunciate a generally useful rule. If the length of the studio is to be governed by the use of lenses already in the possession of the photographer, it will be found that to take full-length cabinet pictures it will be desirable to have the studio five or six feet longer than half as many more feet than the lens has inches of focus. Thus, a twelve-inch (equivalent, not back) focus of lens should have eighteen feet and six feet, total twenty-four. This is a simple and useful rule, and suggests the focus always desirable for full-length portraits, i.e., two-thirds as many inches as there are feet between sitter and lens. We will shortly return to a further series of considerations.

The Glasgow Exhibition, 1901.—This great international Exhibition, of which photography is to form an important part promises, we are pleased to learn, to fulfil the aims of its promoters “to present a full illustration of the produce and manufactures of the British Empire, its dependencies, dominions, and colonies,” with an adequate representation from other countries. The inaugural date has been fixed for May 1 next, and it is intended that it shall remain open for a period of at least six months. Glasgow has high hopes, but no definite assurance, as to the personage by whom the opening ceremony will be performed. As the city lies in the centre of the great manufacturing, shipbuilding, and engineering industries of Scotland, the collection of machinery will be exceptionally large and important, and for it an enormous building, which, although temporary, presents effective architectural features, is now practically complete. We further learn that the commanding features of the group of buildings, connected by spacious covered avenues, are the new Art Gallery and Museum, which are to be the future home of the art and science collections of the Corporation of Glasgow. This magnificent structure may be regarded as a direct outcome of the 1888 Exhibition, and it is in connexion with its inauguration that the Exhibition has been organized. With the 1888 surplus as a nucleus, the subscriptions of private citizens have provided towards the cost a total of about 130,000/-, and the profit of the coming Exhibition will be handed over to the Corporation, to be applied towards reduction of the balance—the galleries are to cost about 200,000/- and for the promotion of art and science generally. Holding that the beginning of the twentieth century affords an appropriate occasion for reviewing the art of the preceding hundred years, the Executive Council of the Association have decided to form a loan collection of pictures and sculptures, and the appeal which has been made to art collectors has met with such a cordial and ready response that the display of objects of artistic and historical value promises to be unique. Her Majesty the Queen has intimated her purpose of making appropriate loans from the Royal collections, and the Prince of Wales readily consented to enrich the section by sending several artistic treasures for exhibition. As President, the Fine-Art Section has Lord Balfour, of Burleigh, the Vice-Presidents being Sir E. J. Poynter, Sir George Reid, Sir Francis Powell, and Sir Charles Tennant.

The Cinematograph at the British Association.—For the first time in the history of the peripatetic Parliament of Science the cinematograph has been used for illustrative purposes at a meeting of the British Association. A report of Monday last's proceedings at Bradford states that the Mechanical Science Section (G) allowed the electrical engineers to have a field day, and all the seven papers read before it related to either the generation, measurement, or use of electricity. The first paper, by Mr. J. G. W. Aldridge, was upon the use of the automobile for electric street traffic, and the rumour that it was to be illustrated by the cinematograph caused an unwonted number of ladies to gather in the dark and gloomy lecture theatre in which Section G meets. If the ladies expected a display of animated photographs rivalling the nightly exhibits at certain London places of entertainment, they would be grievously disappointed, for the cinematograph pictures only numbered two, and neither of these was exactly up to the London standard. However, as the first attempt of the kind at a British Association meeting for illustrating a scientific paper, the display deserves mention, and Mr. Aldridge must be congratulated upon initiating a custom which will, no doubt, find numerous imitators in later years. There are, of course, many subjects of scientific interest which lend themselves to cinematographic illustration, and no doubt, in future years, the authorities of the British Association will not neglect such an obvious opportunity of attracting large audiences to some of the meetings.

The Business Instinct.—An amusing instance of the business instinct of the fair sex, which has, no doubt, been fostered by the photographic advertisements of enterprising firms, is furnished

y a morning contemporary. It remarks that maternal rapture and business enterprise are effectively combined in a letter received by a West-end firm of baby-carriage builders. It runs: "Dear Sir,—I ave one of the loveliest babies imaginable, and the envy of the eighbourhood, a photo of which I beg to enclose. If you will resent me with one of your baby carriages, I shall have much pleasure in recommending you to all my friends, which would undoubtedly be a better advertisement for you than the ordinary apers." The sending of the photograph was an inspiration. A aby as a perambulating advertisement of everything it had on, of he vehicle in which it rode, and the special brand of food it was eared on, would introduce a novel excitement in park and suburban ife. But the story is not complete. In our opinion the lady deserved the carriage as a reward for her enterprise. Of course there s only one lovely baby in the world, and every mother has it; but, f they are all photographed with the view of obtaining juvenile urniture and clothing on the cheap, legitimate trade in those necessary articles is in danger of suffering.

Photography at Irkutsk.—In the course of a series of articles in the *Daily Chronicle* on Irkutsk, the capital of Siberia, Mr. Henry Norman remarks that there is an air of well-being about the place which says more than any catalogue of facts. "I have seldom been more surprised than when, on the evening of my arrival, I started out to make a few purchases. I wanted some sardines and sugar, and similar supplies, and I found myself in a shop which, for size, arrangement, and variety of stock, would compare with any in the West-end of London, except, perhaps, such exceptional purveyors of luxuries as Morell's and Fortnum & Mason's. Next I wanted some photographic materials, and the first thing that caught my eye was a complete assortment of Zeiss lenses of the latest pattern, the most expensive lenses in the market. Two stationers' shops and a chemist's were certainly equal to the average of such places in any of the capitals of the world, and in another I saw such a stock of guns, rifles, revolvers, cutlery, and electric fittings as I have never seen in one place before. I should be at a loss where to look in London for such a selection of telephones, for instance, of every make and size, as were displayed in this Siberian shop." In most minds Siberia signifies desolation and dreariness, and it will, no doubt, surprise many English readers to learn that its chief town is so well advanced in modern civilisation that it is comparable in some respects to London, and is not behind it in the important matter of photographic apparatus.

The Fulham Camera Club.—We are pleased to learn from a local contemporary that the newest London photographic society, the Fulham Camera Club, has made its first public appearance under circumstances which augur equal prosperity and pleasure. On Wednesday, September 5, the Chairman, Mr. Arthur C. Baldwin, delivered his inaugural address at the headquarters, Darlan Hall, where the Club has a comfortable little room on the ground floor. Ere long, it is added, we shall, doubtless, see the walls of this apartment adorned with the fascinating work of members. Mr. Baldwin's address, which we reprint elsewhere in the JOURNAL, was exceptionally appropriate. "He had to deal with a scientific subject, and dulness would have been excused in any one else. But he so lighted up the darker portions of his subject with lambent humour that he retained the keenest interest of his hearers till the very end. The whole was concluded with an apt quotation from the poet Baldwin-speare, this effort affording proof that the Chairman of the Camera Club can really overcome a tendency which some regard as irresistible." The next meeting of the Club will be held on Wednesday, September 19, 1900, at eight o'clock, p.m., at the Large Hall of the Conservative Club, Shorrols-road, Fulham, when a lecture will be given by Mr. E. J. Wall, F.R.P.S., on "What Photography can do," illustrated by lantern slides. The chair will be taken on this occasion by Mr. Thomas Bedding, F.R.P.S., Editor of the BRITISH JOURNAL OF PHOTOGRAPHY.

JOTTINGS.

THE four counties of Surrey, Middlesex, Berks, and Bucks, touch corners at a distance from that gilded artery, the Strand, which may be comfortably traversed in less than three-quarters of an hour. There, amongst scenery as beautiful and as solitudinous as one may find in most parts of England, I have been resting, recuperating, photographing. On my favourite moor "every prospect pleases, and only man is vile." To be precise, it is man's handiwork that I object to in my retired haunts near the little river Colne. The greatest possible sympathy with the inhabitants of the East End of London in their occasional lack of drinking water cannot stop me from lamenting that the Water Companies are ripping up eight miles of pretty country, building vast reservoirs, and affronting the face of Nature with their ugly engines and derricks in order that there may be no more famines in Adam's ale five and twenty miles away. East London may just as well be as remote as Timbuctoo for all the real solicitude in the matter one can feel when one contemplates 3000 or 4000 stalwart navvies laying unsympathetic hands on pretty little spots one has quietly meditated in at occasional intervals for twenty or thirty years. You wonder why Mile End-road does not go at once to Wales for its drinking water, as it surely must do sooner or later. But water companies, besides other failings, suffer badly from shortsightedness. A Welsh water scheme would have suited the inhabitants of the Tower Hamlets just as well as one which originated at Wraysbury; it would have left the silent country side near this tiring metropolis in undisturbed possession of the priceless charm of quietude, and it would not have interfered with my photography this early autumn.

OF course I think the last consideration the most important. The greed of big dividends is uglifying Greater London so quickly that very soon we shall want Mr. Behr's ninety miles an hour monorailways radiating north, south, east, and west, so that the town brain-worker may be able to make a nightly escape from the bricks and mortar, and rapidly travel to his office in the morning. Even Brighton must before long lose its suburban character, and people will have to live a hundred miles off. But, to have done with grumbling; I wonder if any fellow-photographer has ever been undeceived in the same manner as I was in the course of my recent wanderings? I have had before me the mental vision of a house in West Middlesex, which I last saw thirty years ago, when I was a small boy. For the purposes of the descriptive parts of a book, which, with the acquiescence of a friendly publisher, I may one day lay before the reading public, I wanted a photograph of this house, which, to let the reader into a secret, was that hated institution, a school, the most horrible thing in the world at the age of ten. All these years I had been picturing the building as large and lofty, and the clock tower, with its warning and unsympathetic hands, as looking down from a cloudy height on to a series of prison-like houses set in a prim and geometrically designed park. Recalling the cramped situation of the place, I wondered on the way if I could "get in" on my plate all that I wanted of this imposing pile of buildings and the surrounding trees. But, alas! yet one more of youth's illusions was to go. The place was delightfully easy to photograph; my wide-angle lens was not wanted; the clock tower and the other buildings were not half the size I had pictured them, and before me is the photograph to show that the ideas that I had on the subject as a lad were terribly exaggerated and unreliable. Now I am wondering if the place would have looked so small to me if I had not been a photographer. It is curious into what trains of retrospection the habit we all have of revisiting scenes in which we moved in the long ago may beguile us. Looking at the disappointing clock tower, it seemed to be only a matter of months back that, in company with a small boy of equally tender years, I made my first experiments in photography. He owned a quarter-plate solid-body camera, a French portrait lens, and a tent, and I, out of a limited amount of pocket money, "stood" the collodion, the silver, and some other things, in order that I might have a share in some Sunday morning photography in a back garden. If I am not mistaken, Mr. Edward Dunmore, so well known to readers of this JOURNAL, sold me the chemicals twenty-five years ago.

SILLY-SEASON paragraphs have this year been fewer than usual, owing, no doubt, to the war news, of which one may easily see that everybody is quite tired; but, in place of the big gooseberry and the sea-serpent, the newspapers now and then fool their readers with some strange things about that godsend to the modern penny-a-liner or brain-fagged lady journalist, photography. Two or three of these productions lie before me, and they may amuse others as they have amused me. One is to the effect that "the latest photographic novelty is intended to supersede tattooing. The device is printed from a negative on to a portion of the skin, which has been converted for the nonce into P.O.P. All the usual ceremonies are carried out. We are not told how long the patient has to sit out in the light with the negative tied on to his epidermis, or whether the chemical preparation of the same is altogether pleasant or conducive to its welfare. The idea, whatever it may be worth, is due to a Russian, M. Dinkeresco." I never heard of M. Dinkeresco, and I should not be surprised to learn that, Mrs. Harris-like, there's "no such person;" but his idea may at once be put down as stupid and worthless, even were it practicable. A tattooed image is not easily affected by soap and water, but how M. Dinkeresco (or the Fleet-street scribe) proposes to make a gelatino-chloride image permanently adhere to the skin is not clear.

THEN we have a yarn about a photographic record, made in America, of course, and recently referred to, if I am not mistaken in a photographic paper published here: "A photographic record was made during the recent session of the Ohio and Michigan Photographic Association. A negative and finished print were made at ten o'clock at night, to test the utility of artificial light. The experiments were conducted by O. H. Smith and D. Rosser, of Pittsburg; the negatives were made with four seconds' exposure by acetylene gas, and the print was done by the same means. The total time consumed in the operation, beginning with the exposure and ending with the finished picture mounted on a card, was eight minutes and twenty-four seconds, this constituting the world's record." This is smart work; but, if I were a betting man, I would back myself to do it quicker, or produce a dozen photographers who could, although I would not guarantee the quality or the permanency of the negative and positive. But how do the Ohio photographers and the Fleet-street persons know that the above-quoted *tour-de-main* constitutes "the world's record?" What was the previous "record"—if any? I always understood that breaking a record meant doing something better than it had been done before. I am under the impression that a negative and print have been produced in quicker time than eight minutes twenty-four seconds. Still, it does not matter if it has not, so far as I know, or come to that, care.

ANOTHER writer has something to say about "biographic improvements" at a London hall of entertainment, the Hippodrome, near Leicester-square. He tells us that "the cinematograph, biograph, and bio-tableaux, to the ordinary pleasure-seeker, all mean one and the same thing, the presentation of 'living' pictures." He had an interview with Mr. Walter Gibbons, whose pictures, now being shown at the Hippodrome, are as fine as any in London. "He told me that he was about to introduce a new contrivance whereby the 'flickering' can be avoided. For those who do not understand the working of this form of 'magic lantern,' it may be mentioned that the film falls between the light and the lens, and that after each picture—there are 20,000 in some scenes—a shutter falls to separate one view from the other. What Mr. Gibbons' invention is cannot be publicly stated, but it will mean that this shutter no longer causes a dash of black on the screen between each picture. Mr. Gibbons hopes to produce eventually stereoscopic pictures, instead of the flat views now generally seen; and coloured pictures are also being inquired for. Some dexterous people manage to colour the film, but this is both expensive and laborious. A system whereby the rays of light could be coloured is receiving Mr. Gibbons' attention."

I SHALL be quite satisfied to die without seeing any more animated photographs, of which, as an individual, I am sick and tired; but, for the benefit of others who like looking at these pictures and object to the flicker, I will mention two ways in which the movement may be very greatly minimised. One is to hold the hand, fingers apart, in front of the face, when looking at the screen. By this device the eyes are certainly saved from the disagreeable effects produced by the jumping of the rapidly passing images. The second way is to look at the screen through one of the perforated fans introduced by Messrs. Lumière and Messrs. Gaumont some year or two ago—this has the same screening effect as the interposed fingers. With regard to Mr. Gibbons and his contrivances for avoiding flickering; making the pictures stereoscopic and colouring them: how often, I wonder, have these things been promised since the time, just five years ago, when animated photography was being introduced to entertainment-seekers. I don't wish to discourage Mr. Gibbons, but he is rather late in the field.

THE photographic columns in the country newspapers are, as a rule, well compiled and reliable, for in nearly all cases the writers are indebted for their information to the photographic papers. The *Leeds Mercury's* photographic notes, in particular, are well done, but the writer should guard against a tendency to contradict the statements of those who have an authoritative advantage as to sources of information, to which he can hardly lay claim. For instance, in the *Mercury* of Saturday last he somewhat rashly impugns the accuracy of this JOURNAL as regards a matter of fact upon which it is hardly likely to go wrong. He writes: "The BRITISH JOURNAL OF PHOTOGRAPHY, in commenting upon a case recently tried in the City of London Court in respect to the delivery and price of war portrait buttons, in which the plaintiffs, a Bohemian firm, sued the defendant for 250 gross of these buttons, remarked upon the low price (less than fourpence a dozen), which includes a brooch and pin, and added that this does not allow much for the production of the photographs, or for much care to be bestowed upon the fixing and washing, and asks, 'Who can be surprised that in a short time they show signs of decay?' I should have thought our usually well-informed contemporary would have known that these photo buttons are not produced from ordinary silver prints, but are collotype reproductions, the fading properties of which are practically *nil*, and the cost of production infinitesimal in comparison with the chemically made prints." Collotype buttons are, no doubt, produced in large numbers, but it is doubtful if the greater proportion of these little emblems are not printed in silver. At any rate, before me as I write, are some twenty or thirty specimens drawn from the stock of probably the largest photo-button makers in the world; and the prints are in albumen, gelatine chloride, bromide, and velox, coloured and uncoloured. In the stirring months of March, April, May, and June, millions of these silver-printed photo buttons were sold. I should not have troubled to put the *Mercury* contributor right on this point were it not that his photographic notes are generally so good that it is a pity they should be marred by excessive cocksureness. Another *Leeds* paper also prints photographic notes and comments; but these lack the good points of those printed in the *Mercury* and have a monopoly of many bad ones.

TWO or three questions in the Answers columns of the JOURNAL, relating to English operators obtaining employment in Paris, not having been replied to, a note on the subject here may interest others besides the inquirers. I have frequently come across instances in which young portrait photographers have hankered after berths in Paris studios without knowing how these latter establishments compared with English photographic ateliers. From inquiries made on the spot, I would not recommend English operators to go to Paris if self-betterment is the object. People are apt to think that, in the Lutetian home of taste and refinement, portrait photography is something higher in esteem and excellence than it is in London and the other large towns in Britain. Not so. At one time, according to a friend of mine who has had an intimate knowledge of French photography for forty years, the products of the best Paris studios were far more beautiful, more artistic, more to

the tastes of cultivated folks than the best English work. It is the other way about now. In time to come the pendulum may swing back again, but at present a talented English portrait photographer would only be wasting his time in going to Paris. He would be far better paid, and get a readier access to the front rank of "the movement" here in London, or in Glasgow, Edinburgh, Manchester, Brighton, or Dublin. Socially, too, I believe, the photographer on the Continent is looked down upon. Here persons of noble birth do not disdain to enter the profession, and fifteen years ago the mighty Lord Mayor of London himself was a photographer. COSMOS.

EXPERIMENTS WITH LIPPMANN'S PROCESS BY DR. LUPO CRAMER.

In the current number of the *Photographische Correspondenz* the above writer gives an account of some experiments he has been making with this process, and has discovered a peculiar blue colour in the infra-red, which is not without interest to workers in this process, particularly as he has made special tests of some of the sensitizers, and he points out that the number of them which can be used for this process is very limited. Besides the old and well-known dyes, such as erythrosine, chinoline red, and chinoline blue, Neuhauss has recommended glycin red and nigosin B, and these were tried without success.

Of the larger number of dyes which have been discovered by Valenta, Eberhard, and others, for sensitising silver bromide to the region of the spectrum between D and A, there are few which act than cyanine better for Lippmann's process, in which the *sine-quanon* is an exact reproduction of the whole visual spectrum when taking mixed colours; the absorption band of this dye is in the orange red, but its sensitising power for the red with normal highly sensitive silver bromide is, however, very little.

When working with "grainless" silver bromide, however, there is soon noticed a marked difference between the "grainless" and the coarse-grained silver bromide, with respect to its disposition for the optical sensitizers, whilst with very sensitive silver bromide, even with the best sensitising, the action of the blue is always so much stronger, that a colour-correct result is not possible without a yellow filter, with a grainless emulsion such a preponderance of the sensitiveness for the rays of less refrangibility may occur that a blue or green light filter may be used.

But it is not only in the sensitiveness for the rays of longer wavelength over that of the shorter wave-lengths that the two silver bromides differ. The bands of sensitiveness in the grainless bromide lie much further towards the red than with the coarse, and thus is explained that with cyanine sensitising not only sensitiveness to the whole of the red is possible, but, according to some authors, why traces of the infra red have been obtained.

The author tested other dyes as to their behaviour on grainless silver bromide. He first tried chlorophyll in the form of a freshly prepared alcoholic extract of grass. With this the red was much broader in the spectra obtained than with cyanine plates. It frequently happened with the author's chlorophyll plates that, in the infra red, a narrow strip of blue appeared; since, however, such colour anomalies appear in Lippmann's process so frequently, this anomalous blue did not appear of very great interest.

From the impossibility of accurately determining the exact quantity of chlorophyll used, the author soon turned his attention to the artificial dyes, whose sensitising action for red was well known, and he used formyl violet, wool black 4 B, and malachite green, and also a dye not previously tried, benzyl blue.

In using these and large numbers of other dyes the author obtained every time, besides the very broad red stripe, a stripe of beautiful brilliant blue. While all the colour anomalies in Lippmann spectra can, almost without exception, be reconciled with Zenker's theory, by finding as the cause a change of the distance of the laminae in consequence of the expansion or contraction of the gelatine film, this could not be done for this particular blue stripe.

Dr. O. Buss first pointed out to the author that the wave-length of the rays on the infra side of the red, where the anomalous blue

appeared, might possibly be double the wave-length of the normal blue, which corresponded in colour to this anomalous blue. Here is a blue which was produced by laminae in the infra red. The further following out of this theory has been left to Dr. Buss.

Dr. Buss's explanation, which appears to be worthy of acceptance, is supported by a further series of facts, which have been partly observed by others. This blue in the infra red region of the spectrum, which, from analogy with the contra octave in acoustics might be called the contra blue, does not appear to have been previously observed, for Krone obtained, beyond the A line, a dark purple, and Neuhauss a peculiar dark green, which he did not describe as a specific colour, and which, according to his descriptions, appears to have nothing in common with our blue. As the said experimenters only sensitised with cyanine and erythrosine, it is also conceivable that "contra blue" did not show itself to them. But this blue shows itself in other ways in spectrograms, if the emulsion was not sensitised at all. If, for instance, a finished spectrum is breathed on, the colours, as is well known, pass successively, with increasing dampness, from blue to red, and on the red follows regularly a blue, just as, when drying a Lippmann plate, the blue always appears immediately before the red.

This blue, which always occurs next to the red, without the intervention of yellow and green, was an anomaly which is absolutely enigmatical if it is not a blue which is formed in quite another way to the normal blue.

That the "contra blue" is a colour which is produced by the separation of laminae beyond the infra red, is proved by the following experiment: If a colour spectrum is placed in benzole, the colours as determined by Wiener and Neuhauss shift towards the blue end. If for this experiment one of the author's spectra is used, which shows the contra blue, the latter becomes red, since the infra red rays now, as the result of the refraction of the medium benzole, reach our eyes as visible red rays.

A further proof of the assumption that the contra blue is produced by films which have, relatively, a great distance from one another, that is to say, by the laminae of the infra red, is that in all cases in which a relatively coarse grain has been produced, for instance, through ripening with ammonia, the contra blue always showed itself without fail, even if the normal blue did not appear, and the green and red only appeared dull. It is, indeed, a frequently observed fact that with Lippmann emulsions, when by not sufficiently quick working, the use of too much gelatine and other mishaps a coarsening of the grain is obtained, violet and blue may easily be not obtained, whilst the green, yellow, and red still appear distinctly. For the production of the normal blue there is required obviously the finest grain, whilst for the formation of the infra red or the contra blue a grain may be sufficiently fine though about twice as coarse. Further, the fact that with comparatively thick coating of plates the contra blue appeared with special brilliancy, whilst the other colours were much duller than with a thin coating, appears to support Buss's explanation.

A very instructive experiment, which shows that a brilliant blue is produced where no blue ray can have fallen, is made by exposing a Lippmann plate, sensitised with the above-mentioned sensitizers, through an aurantia screen. The normal blue is absolutely wanting, and there is obtained three bands of about the same breadth in the unusual order, green, red, and blue.

The heliochromes which were prepared by Becquerel, Poitevin, and others with silver sub-chloride as the base before Lippmann's discovery in 1891, suffered, amongst other things, from the disadvantage that they could not be fixed, because, by the dissolving out of the unchanged silver haloid, the thin Zenker's laminae produced by exposure must naturally be altered as regards their relative positions. Lippmann's results excited therefore considerable interest, because he was the first to succeed in producing fixable, that is to say, for all time permanent, pictures in natural colours.

Curiously enough, nobody appears to have thought that a picture prepared according to Lippmann's process need not actually be fixed. If a plate coated with grainless silver bromide be half covered with black paper and be laid in bright daylight, the exposed half becomes coloured only after some hours, which may be seen when it is laid on

white paper. The maximum of colour is soon reached, however, and has no effect on the reflection of the incident light in colour records if an unfixed picture is exposed for days and weeks. The author, in this and all the following experiments, has always made very careful comparison, by taking as broad a spectrum as possible in the middle of the plate, so that, when the plate was taken out of the slide, it had only to be cut down the middle in order to have two plates with exactly the same latent image on each. In this way errors were avoided which might otherwise have been met with if successive exposures had been given, in which case exact comparison could not have been made, as every source of light is inconstant. In consequence of the inconstancy of sunlight, when the Fraunhofer lines were not required, the spectrum of the electric arc was used, as has been recommended by Valenta, Krone, and others.

The fixing of Lippmann's heliochromes is, according to the author's views, quite unnecessary; but, on the other hand, as fixation is no trouble, there is no reason in laying much stress on the importance or uselessness of fixation; but, as regards the use of the dangerous or, at least, unpleasant potassium cyanide, the author states that he could find no advantage in the use of cyanide over thiosulphate. It is true indeed that the cyanide removes any faint fog, but it also very quickly attacks the image itself, and it is therefore more advantageous to remove any existing fog, after fixing with thiosulphate, or after drying, when one can properly estimate the colours by a very weak Farmer's reducer. An increased brilliancy and clearness of the picture after fixing with cyanide, as compared with thiosulphate, could not absolutely be confirmed.

Neuhauss¹ has mentioned that Lippmann's heliochromes dissolve very easily in hypo, and advances this behaviour as the difference between grainless and ordinary silver bromide. Now, although it is correct that the coarse silver grain of a highly sensitive plate dissolves only slightly in hypo, whilst a Lippmann picture is strongly reduced in a five per cent. solution of thiosulphate after two hours. This is no peculiarity of heliochromes, for all fine-grained silver, for instance, printing-out paper or a fine-grained chloride of silver plate for development, dissolves to a considerable extent.

If to the hypo some bisulphite is added, as is very general at the present time, there will be only a scarcely noticeable amount of silver dissolved after some hours' action on a heliochrome. The bisulphite prevents the oxidation or sulphuration which, according to Sexton,² and Haddon, and Grundy, is necessary in order to enable the silver to dissolve in the hypo.

If it is desired, therefore, to fix a Lippmann picture so as to make it absolutely permanent, a good acid fixing bath should be used, and no disadvantages need be feared if one should accidentally leave a picture in the fixing bath for a long time.

Neuhauss questions, in the face of the latest publications of Professor Wiener, whether the films of a finished heliochrome actually consist of metallic silver.

According to the author's researches, there is no fundamental difference, either in a chemical or physical respect, between the precipitate of a Lippmann picture and the silver which is produced in any other photographic process. Some of the author's experiments have given quite different results to those obtained by Neuhauss.

Any retrogression of the latent image could not be confirmed. The plate was, after exposure, cut in half along the spectrum, the one half developed at once, and the other after forty-eight hours in a developer of the same composition, and for the same time; not the slightest difference between the two halves could be seen. A weakening of the latent image, in consequence of soaking the plate in water before development, as stated by Neuhauss, never occurred with the author's plates.

Neuhauss's observation³ that the coloured picture was extraordinarily resistant to nitric acid, and that even after twenty hours' stay in dilute nitric acid the precipitate had suffered not the least change, appeared very striking to the author. The silver of the author's heliochromes was, after thirty seconds of nitric acid, sp. gr.

¹ Eder's *Jahrbuch*, 1900, p. 179.

² Eder's *Jahrbuch*, 1897, pp. 414, 415.

³ *Loc. cit.*, p. 189.

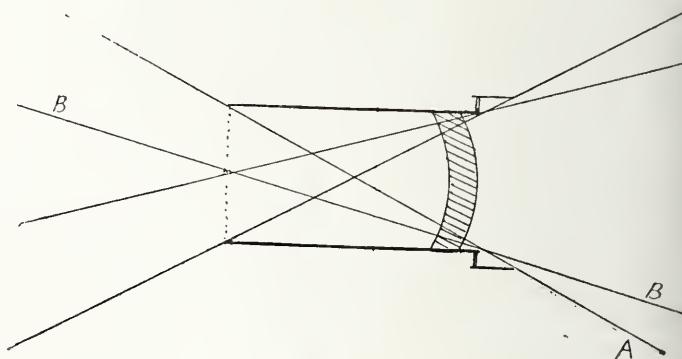
1·153, corresponding to 25 per cent. HNO_3 , completely dissolved, whilst an ordinary negative required considerably longer time to dissolve its silver.

There is therefore no cause to assume that the picture, the laminae in the nodes of the stagnant waves, can consist of anything else but metallic silver, for it answers to all the reactions, and when Wiener says "that it might be coherent silver, but that, on the other hand, its brown colour when looked through is against this, for coherent silver is blue when looked through," the author points out that the colour of the silver is of no importance. With silver chloride plates for development, such as are used for lantern work, it is possible with various developers, by variation of the time of exposure and many other means, to produce almost any desired colour. No one, however, will conclude from this that there are essential different kinds of silver.

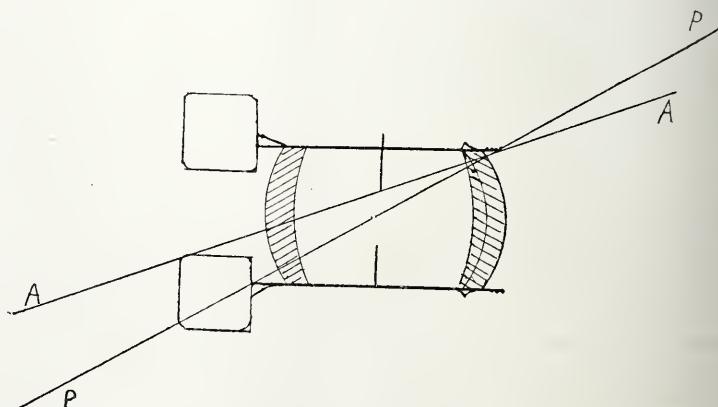
ONE EFFECT OF STOPPING DOWN.

BEFORE the days of photographic text-books, there was a common notion that a lens stopped down covered a larger plate than it did at full aperture. Since the advent of text-books, photographers have been told that this fallacy was due to the fact that a lens gives better definition at the margin of its field of illumination with a small diaphragm, and hence may be used satisfactorily on a larger plate. The extent of the field of illumination, however, the text-book writers say, remains precisely the same under any diaphragmatic alteration.

This latter statement is hardly accurate. In fact, as regards single-



lenses, it is absolutely untrue, the truth being that the smaller the diaphragm, the smaller—within limits—is the field of illumination; and, as regards doublet lenses, it requires qualification to this extent, that, when any aperture before or behind the lens, such as a prominent lens-hood, a shutter, or a hole in the front of a box hand camera, is of such dimensions as to cut off rays that would otherwise pass through the lens,



the field of illumination is diminished by the introduction of a small diaphragm. The accompanying diagrams will make this clear.

A A, is a marginal ray passing through a single lens at full aperture.
B B, is the extreme marginal ray that can pass at pinhole aperture.

The same reasoning applies to the doublet, under the conditions mentioned.

Suppose a rectilinear, fitted with a before lens shutter, two sizes too small, and protruding enough to cut off some rays that would otherwise pass through the lens, e.g., P.P..

The result is that a diminution of aperture reduces the field of illumination. A.A., an extreme marginal ray, clearly could not pass through the lens if a smaller stop were inserted.

This is true only when some rays are prevented from passing through the lens by an aperture either before or behind it; because, in a symmetrical lens, in which the components are symmetrically mounted relatively to the diaphragm, the marginal rays pass through the centre of the diaphragm, and a reduction of aperture has no effect on the dimensions of the field covered.

Photographers should see that the plate is covered with the stop they are going to use. Sometimes it is well to have the corners covered, however bad the definition may be.

J. C. SMITH.

NOTES ON GOLD-SODIUM CHLORIDE.

[A Paper read before the Photographic Section of the Franklin Institute.]

If any one will take the trouble to obtain quotations from the various manufacturers, or consult their price-lists, it will become apparent at once that there must be either a considerable margin of profit for some, or that the gold-sodium chloride varies much in composition. The difference in prices, or information on the labels, are such, however, that the various makes come into direct competition with one another. For example, one ounce of gold-sodium chloride, U.S.P., in $\frac{1}{2}$ -ounce vials, is quoted by several makers (wholesale price-list) at \$5.90, \$6.10, \$7.50, \$9.60, and \$14.50, respectively. Again, some makes, without any specifications as to quality, are generally quoted a few cents below those containing information as to quality.

It must be remembered that the 1890 Pharmacopoeia requires this article to contain thirty per cent. of metallic gold, and a commercial article may contain less for photographic purposes; but the latter should be so labelled as not to be brought into direct competition with the more costly article. If a certain article is prepared for photographic purposes, or for some other purpose, let it be so labelled as not to be misleading.

In order to get positive information about this article, the writer secured a number of samples, and a careful examination of the same gave the following results:—

ANALYTICAL DATA OF GOLD-SODIUM CHLORIDE.

Number.	Condition.	Reaction to Ammonia on Glass Rod.	Reaction to Litmus.	Weight in Grains in 15 gr. Vial.	Solution Containing 15 gr. in 100 c.c. Dist. Water.	Marks on Labels.	Achiral per Cent. of Metallic Gold Gravim.	Per cent. of Gold Based on 15 Grains Gravim.
1 {	Quite moist	{ None	Acid	13.55 {	Slightly opalescent	{ 15 grs.	23.55	21.29
2	Dry	"	"	14.42	Clear	15 grs.	27.22	26.13
3	Dry	"	"	14.86 {	Slightly opalescent	{ 15 grs.	25.00	24.68
4	Dry	"	"	17.53	Clear	{ 15 grs. U.S.P.	{ 28.31	32.91
5 {	Slightly moist	{ "	"	14.45	Clear	{ 15 grs. U.S.P.	{ 30.30	29.02

The amount of material contained in each vial was estimated by removing the stopple, determining the gross weight, then carefully removing the chemical by means of water, drying the vial, and obtaining its weight. From these weights the amount of gold sodium in each vial can readily be calculated, and, if there should be an error in any direction, it is quite likely to be in favour of the chemical.

The metallic gold was estimated as follows: Transfer the contents of a vial into a 250 cubic centimetre evaporating dish by means of 100 cubic centimetres of a one per cent. solution of pure sulphuric acid. In this mixture dissolve two grains of pure oxalic acid, then place the whole on a steam bath for two hours, or until all the gold is reduced to the metallic state. Decant the clear liquid as closely as possible, wash the gold with distilled water, dry, ignite, and weigh. This method works well, but the volumetric process for this purpose appears to be valueless.

From a careful perusal of the data contained in the foregoing table it can readily be seen that all the samples were of good quality, but there is a wide variation in the percentage content of gold.

In order to fully comprehend the actual difference in money value existing between the various samples, it is only necessary to compare the figures below:—

Number.	100 ozs. Gold-sodium Chloride contained Pure Gold.	Cost at \$21 per Ounce.
1	21.29	\$447.09
2	26.13	548.73
3	24.68	518.28
4	32.91	691.11
5	29.02	609.42

The greatest difference, based on the cost of the gold only, amounts to \$244.02, or by eliminating the highest, which appears to be somewhat abnormal, the difference becomes \$162.33. In other words, the purchaser of 100 ounces of the article containing the smallest per cent. of gold is paying \$162.33 for something he is not getting. In this case, as in many others, the cheapest is the most costly. LYMAN F. KEBLER.

AMERICAN PHOTOGRAPHIC COPYRIGHT.

THE following circular, which we reprint from *Anthony's Bulletin*, has been issued by the Copyright League of America to United States photographers. By the tenor of the circular it would seem that American photographers as a body are as indifferent to the value of copyright in their photographs as were their British brethren up to six or seven years ago, when the Photographic Copyright Union took steps to arrest the apathy that had hitherto prevailed.

"The American photographer as a rule is keenly appreciative toward any movement which promises him an advantage in business. The growth and importance of the State and national photographic associations are practical evidences of his earnestness in seeking business success. In his business methods, in his enterprise, and in his professional ability he easily outstrips his European fellow-professional, as we have known him in Germany, France, and Great Britain.

"But, with all his alertness and progressiveness, he has almost completely overlooked a business advantage which, of all others, he should be the first to perceive and grasp. We refer to his strange apathy concerning photographic copyright.

"In no other country are pictures and illustrations so popular or so important a feature in every-day life as in America. Illustration is, in fact, universal. The daily and weekly papers, the periodicals, and printed matter of every sort with which we are literally deluged at every turn, depend largely for their interest upon illustration. Portraits of prominent people and scenes, pictures which interest as news records or by their pictorial attractiveness, records of incident and life at home and abroad, in-doors and out of work, and sport, of humour and pathos—all these are sought for, gathered in, and published far and wide by every conceivable method of reproduction. The public demands pictures and the public pays for them. But who makes the pictures and who profits by their sale? Here are two plain questions. Let every photographer answer them for himself, and we are sure of his interest hereafter in the question of photographic copyright.

"A glance at any illustrated paper will show that the photographer bears the burden of the public demand for illustrations. Nine-tenths of the pictures published in our newspapers and periodicals are direct reproductions from photographs. In how many instances does the photographer profit by this use of his work? We venture the answer, Not in one instance out of ten. Why should he not profit by this use of his work? If he equips himself for its making, if he produces by his skill something which has saleable quality, should he not be the first to profit by his skill and labour? Does the publisher furnish his paper to the public without money and without price? Why should the publisher profit by selling the photographer's work, and the photographer be content with 'glory'? Does the publisher pay the photographer for the use of his productions? Sometimes, when he is compelled to do so; never, if he can avoid it. Why? Because the photographer has not yet learned to appreciate the value of his work to the world—its plain matter-of-fact value to those who purvey news or information to the public.

"These things are worth thinking over. By availing himself of the protection of copyright the photographer may secure for his own benefit certain legitimate profits arising from his business which at present he permits to go to waste, or, rather, to go for the enrichment of other business men who can turn his product into hard cash.

"It must not be imagined that we impute any blame to the publisher.

As a business man it is his chief interest to get and reproduce what the public will buy. If he can get his materials without cost, so much the more profitable will be his business. The mistake lies with the photographer, who is so careless of the sources of income or profit rightly belonging to his business. The remedy lies in a better appreciation of the advantages of copyright and in united action to secure these advantages. If it is found that the photographer is not properly protected by copyright laws at present existing—as is, indeed, the case—there is all the more need for photographers to unite in the effort to secure proper legislation.

"We believe that, as soon as the American photographer looks squarely at this question of photographic copyright, he will perceive its obvious advantages and insist upon his reasonable rights. Therefore, we urge again, as we have urged before, that photographers should enrol themselves as members of the Photographers' Copyright League, and put themselves in touch with the work this League is doing for their benefit and advantage."

SHADOWS.

THE first meeting of the Fulham Camera Club was held at headquarters, Darlan Hall, Darlan-road, on Wednesday evening, September 4, Mr. Arthur C. Baldwin presiding. The Club now numbers fifty, and among those present were Dr. T. A. Appleton, Mr. Peter Lawson, Mr. C. Pretty, and Mr. Littleboy, the Hon. Secretary. Mr. Baldwin delivered his inaugural address as Chairman. Having tendered his thanks to the members for the kindness which had prompted them to elect him to his present position, Mr. Baldwin said his address would bear the title of "Shadows." Should any one take umbrage at the title, Mr. Baldwin referred him to Nuttall's Dictionary for the various meanings of the word. He would not, from motives of expediency, say whether photography was a science or an art, although Sydney Smith had regarded it as high art because studios were near the roof. "Shadow" was sometimes said to be an inseparable companion. Such must be the case with photography, for had not many operators married receptionists? The pursuit of photography was a pursuit of shadows, thus exemplifying Burke's sad reflection "What shadows we are and what shadows we pursue!" Taking a more serious turn, Mr. Baldwin now proceeded to trace the series of scientific discoveries and inventions whose collective force had resulted in the photography of the day. To his mind there were four clearly defined periods in photography. The first began, 1432 B.C., with the discovery of iron, and it included the making and using of lenses by the Greeks, 424 B.C. It terminated in 1839. The second was the Daguerreotype period, from 1839 to 1857. Thirdly came the Collodion period, from 1857 to 1871, a process invented by Scott Archer, which gave place in turn to the present or Gelatine period. This latter year marked the beginning of the success and the adoption of the dry-plate process. The Club would remember that Roger Bacon had greatly advanced the cause of photography by the construction of the camera obscura in 1297. Baptista Porta improved upon this in 1550, and Sir Isaac Newton made the invention almost what it was in the present day. It was, however, to Mr. J. Dollond, who, in 1750, first made double achromatic lenses that the gratitude of photographers was chiefly due. Having dealt scientifically with a number of other matters interesting to photographers, Mr. Baldwin claimed that the art or science had accomplished much for the human race. He referred chiefly to the Röntgen rays, of course. Art and photography, in some people's hands, were distant relations, indeed—in fact, he did not think they could be said to have come from the same family. But certain it was that a vast amount of pleasure was got out of photography, the artistic sense was stimulated, and the scientific faculty assisted. Returning to his lighter vein, Mr. Baldwin said: Having brought you thus far on the subject of shadows, I think I may safely leave it. At the same time I do not claim to have altogether exhausted my theme. It would not be right for me, as your Chairman, addressing you for the first time assembled for the business of the Club, without in some measure giving you a charge. I have been accused—and may I say I own the soft impeachment?—that on some occasions I save racking my brains for words to express my sentiments. I fall back on those of Shakespeare, and, like the little boy when asked to define a lie, said it was an abomination unto the Lord and a very present help in time of trouble, so do I find quotations a salvation indeed. This time, great as my reverence is for the sublime bard of Avon, I am about to take an unwarrantable liberty with the text of Polonius's advice to Laertes. Hamlet called his uncle's chamberlain a tedious old fool. I

trust I have not been playing such a part to-night. However, to my charge:—

My blessing with thee
And these few precepts in thy memory
Look thou character. Give thy dealer no order
For any unproportioned formula to make.
Be thou artistic, but by no means fakish.
The apparatus thou hast, and their utility tried,
Grapple them together in a nice leather case,
But do not waste thy time with trying
Each new-hatched, unfledged process. Beware
Of entrance to a shop; but, being in,
Purchase, that they who keep it may rejoice in thee.
Give to dealers thy cash, but few thy bills;
Take each man's portrait and preserve his friendship.
Costly thy camera as thy purse can buy,
But not of necessity bound with brass, mahogany, or teak:
For the outfit oft proclaims the man:
And they in Fulham of the best rank and station
Have a most select and proper choice in that.
Neither fixed focus nor twelve ten have:
For fixed focus loseth both perspective and sky,
And twelve tens pull the weight down so.
This above all: to thine own Club be true,
And it must follow, as the night the day,
Thou canst not then be on the tramp elsewhere.

Looking back upon our subject—I mean photography—and seeing by what means we are enabled to assist nature to reproduce herself, we are still led to agree with Shakespeare that

"The best in this kind are but shadows,"

and then for a moment let us pause and conclude that the worst are nothing more.

NOTES FROM THE NORTH.

BETWEEN the weather and the war those who make a living by photography in Glasgow and the West of Scotland have had great reason to complain during the past six months, the cry on every hand having been from first to last, "There is nothing doing." With the approach of winter hope is not altogether dormant, but, should another blank season be drawn, the business boom expected in 1901, when our International Exhibition will open its doors and attract the money-spending multitude, will be the only bright spot in the gloomy outlook.

The dealers have done fairly well. Mr. Lizars reports having passed through the busiest season on record, alike in the wholesale and retail departments. Certain lines of his Challenge cameras have never been in stock throughout the summer, the home and colonial demand has been so great. Plate and film cameras have been in about equal demand; but, judging from the film-developing business he has done of late, the supremacy of plates, among the moneyed class of amateurs at least, is at length being seriously challenged. And there have been practically no complaints regarding the uneven quality of the films supplied, a testimonial the film-manufacturers may accept with pride or humility, according as they take blame or not for the pranks films have too often played their users in days gone by.

Preparations are now afoot for another busy winter with the cinematograph and lantern. Mr. Lizars has a cinematographic and phonographic outfit on hand at present for a lecturer who intends to go round the country with it, an outfit which will cost something like 150*l.* Indications are ripe that the slide departments will be strained to supply sets illustrating the most exciting incidents in the siege of Mafeking, Kimberley, and other South African towns. A lady, the wife of a professional photographer in Mafeking, has entrusted a large collection of very fine negatives depicting the leading events in the defence and siege of that historic town to Mr. Lizars to make a set of slides for lecture purposes.

Mr. Warneuke is sending nothing of his this year's work to the Royal Society's Exhibition, his time having been fully occupied in getting his palatial and sumptuous studios at 4, Blythwood-square into ship-shape order. He is more than pleased with the results he has produced so far, and hopes to make another step or two towards the attainment of his exacting ideal of what constitutes an artistic portrait. A number of his earliest portraits taken at Blythwood-square are on view in a handsome show-case at Sauchiehall-street and Mains-street corner, within a minute's walk of the studios.

The attention of local workers is being gradually centered upon the work of the Committee in charge of the Photographic Section of the 1901 Exhibition. At the last meeting of the Committee it was reported that the saloon set apart in the new permanent Art Galleries for the display of photographs would provide space for about 500 frames, but, if additional hanging space be required, the Committee trust to be able to provide it. Mr. J. Craig Annan is devoting no end of time and labour to the organization of the Section, and, unless his expectations are

belied, it will create a record among international exhibitions of photography.

Messrs. T. & R. Annan, Glasgow, are to have the sole right to photograph inside the Exhibition buildings. One of the conditions attached to the concession is that they must erect a studio in the grounds to the satisfaction of the Council. The site granted for the studio is on the slope below the University terrace. Plans are being prepared by Mr. James Miller, architect of the Exhibition buildings.

The Old Closes and Streets of Glasgow is the title of a volume which Messrs. Maclehose, the University publishers, are about to issue by arrangement with the Corporation. Fifty plates have been reproduced in photogravure by Messrs. Annan, representing chiefly scenes of picturesque squalor which have been swept away by the operations of the City Improvement Trust. Mr. William Young, R.S.W., has written an historical introduction to the volume, the issue of which is to be limited.

To open four branches inside six months argues the possession of an unusual stock of enterprise and courage, surely. Early in the spring Messrs. Rae Brothers, opened their first country branch in Paisley. This step was followed at a short interval by the opening of another in Perth. A second branch was started in Perth a few weeks ago, and only last week they took possession of the shop and stock of Messrs. Lawson & Redpath, Charing Cross Mansions, Glasgow, where they will carry on business, after holding a clearing sale. The firm's Glasgow branch at 77 Renfield-street, was only acquired last year from the trustees of the late Mr. James More, so that they are now in possession of six separate businesses, when little more than a year ago they had but one.

Mr. George Walton is so closely associated with photography as decorator of exhibitions, studios, and warehouses, and maker of frames, that his recent acquisition of extended premises for workshops at 35 and 37, Buccleuch-street, Glasgow, is of interest to the craft. These workshops replace his small and scattered quarters in Wellington-street. It is unfortunate—perhaps it was unavoidable—that the front elevation to Buccleuch-street, a quiet residential thoroughfare, is not in keeping with Mr. Walton's artistic instincts and sympathies. A rambling brick building, with a wood stack in the foreground, and surrounded by a closely boarded six feet fence, strikes a jarring note on the aesthetic sensibilities of the passer-by who happens to known what Mr. Walton has done in his own particular line.

Widespread interest has been excited in this quarter over the gratis demonstration scheme just launched by Kodak, Limited. The attendance at the opening demonstrations was large enough to bespeak the necessity for such a simple course of instructions as the Kodak Amateurs' Association aims at providing.

The trepidation roused in England by the introduction of a special water rate for amateur photographers is not shared here. The suggestion has often been mooted, but has as little chance of being adopted as a Government tax on matches. Loch Katrine water is so soft that the photographer who must condense or boil all the water he uses for his solutions would, no doubt, gladly pay a small rate if he could be spared the labour nature has refrained from imposing upon us. The tendency here is to reduce the water rate, both for domestic and commercial purposes, and the pleasant prospect is being held out of a coming generation enjoying a free domestic supply, the rates for commercial purposes being expected by-and-by to defray the expenditure on the maintenance of the water works.

None of the societies have started business yet, October being the month when they begin to break into life. During last winter there was much searching of heart regarding the future of the Glasgow Photographic Society, the oldest of the local societies and the one at which professional workers mostly congregated. Of late years the attendance has fallen miserably low, a dozen or so members being present even when the lecturer or demonstrator had come all the way from England. The quality of the members present may have compensated in some measure for the paucity of numbers; but, when an organization sinks so low, it comes to be a pressing question whether it should not go into hibernation for a period, until interest revives, or cease and determine, as the lawyers say.

Fire broke out, one day last week, in the warehouse under the studio of M. Pearlmans, St. George's Cross, Glasgow, and for a time it seemed as if the entire block of buildings would be destroyed. Fortunately, the timely arrival of the fire brigade checked the progress of the conflagration. While the fire raged the access to the studio was cut off, and the occupants had to make their way to a place of safety by going through the hatchway, and climbing along the roof-ridge for some distance to another hatchway, which gave entrance to a stair away from the burning building. The members of a theatrical company were being photographed in costume at the moment the fire broke out, and, when the alarm was raised, they too had to escape by the roof, several of them clad in scanty attire. The anxiety of the crowd for the safety of the party was mingled with amusement at the figure they cut while crawling along the roof.

Messrs. Anderson, Brothers, who have been in business for many years in Dalry, Ayrshire, have recently opened a branch studio in Sutherland-street, Springburn, one of the populous and thriving working-class quarters of the city. The studio adjoins Wellfield U. P. Church, and is wholly situated on the street level, with an open frontage to the north-east, extending to sixty-five feet. Deducting the space occupied

by the reception room and offices, the studio proper measures forty feet by twenty feet, the back wall being twenty-two feet high. It is in the treatment of the gables and back wall of their studio that the Messrs. Anderson have taken a forward step. The question of backgrounds received the fullest consideration until they came to the resolution to dispense with these accessories in the usual sense, and utilise the wall and gables as a composite background. The commission was placed in the hands of Mr. Leo Wasser, who has already decorated a number of London and Continental studios, and he came down to Glasgow early in July to execute the work. The task occupied fully a month, the canvas covered representing over 2500 feet of painting.

The completed design shows thirteen panels in all, beginning with an Elizabethan theme on the immediate right, and passing to an outdoor scene with a carriage drive, on to a conservatory interior and other familiar background subjects to the left, where a Louis Quatorze interior completes the background. In all there are thirteen panels, so that a fair variety of backgrounds is offered either for indoor or outdoor effects. The *tout-ensemble* is exceedingly pleasant, each of the panels blending into its neighbour without the slightest incongruity. In furnishing the studio the proprietors have displayed a strict regard for historic accuracy, the equipment including furniture both of the Elizabethan and Louis XV. periods, as well as the usual outdoor accessories. The convenience of the background system they have adopted, and the saving in time it will effect have already strongly impressed themselves upon the Messrs. Anderson, who are unrestrained in their appreciation of the results of Mr. Wasser's labours. In respect of its equipment and background departure this studio shows a great advance on the city studios which professedly cater for a working class *clientèle*, and it is to be hoped the proprietors will reap the reward their enterprise merits.

WINTER PHOTOGRAPHIC CLASSES AT THE BIRKBECK INSTITUTE AND THE BATTERSEA POLYTECHNIC.

At the Birkbeck Literary and Scientific Institution, Bream's-buildings, Chancery-lane, W.C., a course of about thirty lectures on photography, practical and theoretical, will be given by Mr. E. Senior (Honours medallist and prizeman, City and Guilds Institute; 1st class honours in chemistry), on Friday evenings at 7.30, commencing October 5. This course will be arranged, as far as possible, to suit the requirements of both amateur and professional students, and will cover the syllabus of the City and Guilds of London Institute, at which examinations in May next students will be expected to sit if required. On the result of these examinations certificates and prizes are awarded to those who prove themselves qualified.

The following are the fees for the course of lectures, 7.30 to 8.30; members of the Institution, 6s.; non-members, 9s. Practical work (per term), 8.30 to 9.30, members of the Institution, 6s.; non-members, 8s. Inclusive fee (per course) for lectures and practical work, members of the Institution, 18s., non-members, 20s.

At the Battersea Polytechnic, Battersea Park-road, S.W., the evening classes commence Monday September 24, 1900. Mr. E. Senior is the teacher of photography, and the following are the particulars of the fees (a reduction of 1s. per class is made to members):—

	Trade Students.			Amateurs.		
	Half-Session.	Session.	Session.	Half-Session.	Session.	Session.
Elementary { Lectures—Tuesdays, 7.30 to 8.30	4s.	—	6s.	—	6s.	—
{ 25 Lessons } Practical—	8.30 to 10.0	7s.	3s. 6d.	10s.	5s.	—
*Advanced { Lectures—Thursdays, 7.30 to 8.30	5s.	—	7s.	—	7s.	—
{ 30 Lessons } Practical—	8.30 to 10.0	10s.	5s.	12s.	6s.	—

The Photographic Department contains a large studio fitted with Joel arc lamp and reflector, for photographic work at night; two commodious dark rooms, lit with electric lanterns, and fitted up with every convenience for work. The equipment includes a $8\frac{1}{2} \times 8\frac{1}{2}$ studio camera and lens, a 10×8 copying camera, fitted with Zeiss lens, an electric light enlarging apparatus with ten-inch condenser, a complete set of carbon and platinotype printing apparatus, and a special camera for lantern-slide making, so that ample provision exists for practical work. The classes are primarily intended for trade students, but others are admitted upon payment of higher fees.

Students will be provided with necessary chemicals and apparatus free of cost, but must provide their own plates, sensitive paper, &c.

Students who desire to gain a thoroughly sound knowledge of the science connected with photography are strongly advised to join a chemistry class, and to attend the lectures on light.

A special class in enlarging will be held on Tuesdays, 8.30 to 10. Fee for ten lessons, 9s.; half-course, 6s.

An electric light enlarging apparatus has been added, and students joining this class will receive individual instruction in making plain and vignettted enlargements on bromide papers, and in modifying the colours of prints by toning.

REJECTED!

(By A WOULD-BE EXHIBITOR.)

A CHANCE prospectus coming to my hand
Told me that there existed a we'rd band
Of Art Photographers, called the Linked Ring,
Whose autumn custom was exhibiting
At "England's Home of Mystery" (rightly named)
About two hundred pictures, each one framed
And priced from ten bob upwards! Then arose
Within my breast a wish to be of those.
. . . I made a lovely print on P.O.P.,
An Oxford frame enshrined its brilliancy,
And this I sent off to the gallery.

But a little after that came the postman's rat-tat-tat,
And a letter through my doorway was injected
To say, with charming grace, that regretted lack of space
Compelled my work of art to be "Rejected."

Discouraged, but not vanquished, I resolved
To try again. The subtleties I solved
Of "Composition," "Chiaroscuro," "Tone,"
And the strange fact that mere technique alone
Is not enough; your print must show "control"
(With Indian ink), and, above all, some "soul."
Far beyond this, if you'd successful be,
Eschew the very vulgar P.O.P.
. . . So the next time I sent a bromide view
Of "Cows" (which looked as though they wished they knew
Whether to run away or merely moo).

I thought it would be hung, for my friends its praises sung,
And said they felt 'twas sure to be selected;
But my labour was in vain, for the missive came again,
Saying, politely, that I was "Rejected."

"Impressionistic" was my third attempt:
It was a picture of a maid unkempt,
And wearing my old dressing-gown, her hair
Drooping in tangled bunches on a chair
(At least, a chair was what 'twas meant to be,
Though a Pears' soap box in reality).
For I had found by visiting the Shows
That "Portraiture" is now the thing that goes.
Given a model with a Turkish gown,
Hair that successfully can be let down,
And titled *Clytie*, you should take the town.

But once more I was quite wrong, for it wasn't very long
Till I heard that all my pictures were "Rejected;"
So I gave them—which was kind—to a College for the Blind,
And I've got a note to say that they're Accepted.

Among the names of the leading exhibitors may be mentioned those of Edward L. Brown, Edinburgh; C. Metcalf, Halifax; John Hummell, London; J. Shawcross, England; T. Whitehead, Alva; W. J. B. Halley, Glasgow; W. Louis Primrose, Glasgow.

The judging was practically confined to Mr. Alexander Robb, of Greenock, and Mr. Archibald Watson, of Hyndlands, with Mr. Dewar, Curator of the Glasgow Botanic Gardens, and there is no doubt the points of difference in several instances were very close indeed.

Hummell, of London, shows some splendid work, and so does Metcalf, of Halifax, but the latter has only succeeded in gaining second honours in the different classes.

Brown, of Edinburgh, takes two first positions, and the gold medal, presented by Messrs. Lizzars, goes to Mr. W. J. B. Halley, of Glasgow, who likewise secures the bronze medal in the class for *Specimen Trees*.

In the class for Views of Ferneries, &c., Mr. Shawcross carries off the coveted honour.

Speaking generally of the medium employed for printing these floral studies, it may be said that the successful exhibits are printed on gelatino-chloride samples of paper, the aim evidently being to render the utmost amount of detail possible in the negative, and the size of picture mostly on view is whole-plate.

Mr. Halley's studies of named trees are among the best things in the Exhibition, and he has succeeded in a very difficult task by so rendering the picture as to throw the trees into prominence in an otherwise charming series of landscapes.

Our Editorial Table.**CHALLEN'S "INFALLIBLE OPERATOR."**

Published by E. G. Wood, Queen-street, London, E.C.

"REMEMBRANCER" would, perhaps, be the better name for Mr. Challen's device, the object of which is to keep the photographer in mind of the necessary particulars of his exposures. The "Operator" is sent out in the form of a book of "tear-off" leaflets, and this is a specimen page, which we take the liberty of reproducing in order to give the reader a clear idea of Mr. Challen's system of memoranda:—

DARK ROOM.

Dust out dark slide and fasten both shutters ...
Dust plates and place them in slide (films out- }
wards, black division between plates) } ...

TO TAKE THE PICTURE.

Subject—

Adjust lighting

Fix camera firmly, square with object and level ...

Stop lens (f) focus, re-cap, and cover }
camera with cloth } ...Place plate (No.) in camera (with No. of)
plate next to lens and away from operator } ...

Determine length of exposure (Secs.) ...

Open shutter furthest from you

Expose plate and re-cap

Replace and fasten shutter

Remove slide and guard it from light

Remove stop

Class of plate used

Conditions

Mark off each process in the right-hand column
as you complete it, and

YOU NEED NEVER SPOIL A PLATE.

A book of fifty leaves, printed as above, costs fourpence. If such an investment ensures a photographer getting fifty good negatives out of fifty exposures, it is a very profitable one.

GLASGOW FLOWER SHOW—PHOTOGRAPHIC EXHIBITION.

The Directors of the Glasgow and West of Scotland Horticultural Society having resolved to repeat last year's venture, viz., the linking of a Photographic Exhibition in connexion with their Annual Flower Show, this interesting feature was again seen in connexion with the Autumn Flower Show, held in the St. Andrew's Hall, Berkeley-street, Glasgow, on Wednesday and Thursday, the 5th and 6th inst. Last year, the venture being new, and probably owing to the fact that what may be termed floral photography was practised by not a great number in the West of Scotland, the exhibit was numerically a small one. This year, however, sees a most gratifying improvement in this respect, and, merely judging alone from the great increase over last year, it is quite evident more attention is being paid to floral photography throughout the length and breadth of the land than many would imagine. In one sense the British photographic press has done much to cultivate a taste among all classes of photographers for this special class of work, during the past year or two, by giving publicity to many valuable articles on the subject. The outcome is seen in the hearty response from all parts of the country to the present Exhibition in Glasgow.

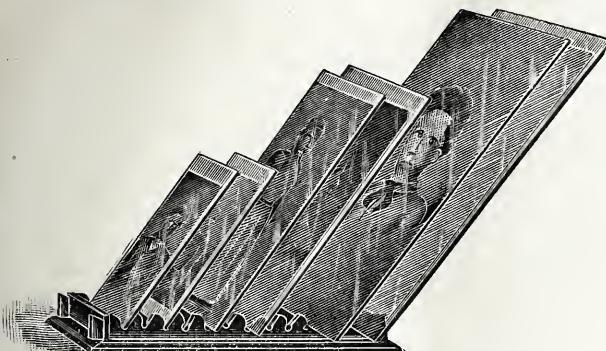
Upwards of two hundred photographs were sent in for competition, and it may interest those that might care to compete on future occasions to mention that, in the great majority of instances, these were merely mounted on good stiff supports, not framed, as in the case of regular photographic exhibitions. This has economised space, which, in the case of a flower show, is a matter of no little importance.

Speaking generally of the photographs exhibited, they are unquestionably of a very high order, as may be judged from the fact that in one case a set of floricultural subjects, which gained a valuable prize at a recent trade exhibition, are in this instance quite out of it.

A CONVENIENT PLATE RACK.

Sold by Marion & Co., Soho-square.

ONVENIENT we at once certify this rack to be, for it already finds a place in our dark room, and, carrying a dozen negatives, takes up little space. [ad]e in *papier mâche* it holds plates from quarter-plate size up to whole



late, and sells for the small sum of eighteenpence. The illustration conveys a perfect idea of how the rack is used.

LESSRS. THOMAS ILLINGWORTH & Co., the enlargers and trade printers of Villesden Junction, London, N.W., in a recently issued circular make the following interesting announcement regarding the first-named department of their business: "We don't want you to forget that we make enlargements of all kinds, and it is no idle boast to say that our results are as good as human man can possibly make them. When we tell you that we are making over 700 enlargements every week, you will understand that we are no novices at the game, and that the results for a long time past must have been very satisfactory to have secured us so large a share of patronage." The principal part of the circular (from which we take the foregoing extract) relates to the establishment of a new department of Messrs. Illingworth's business—that of frames and framing. Their work appears to be both tasteful and cheap.

LANTERN-SLIDE NOVELTIES.

Manufactured and sold by Walter D. Welford, Warwick Lodge, 166, Romford-road, London, E.

ON the eve of the lantern season Mr. Welford is bringing out a series of little novelties which appeal to those photographers who prepare transparencies for projection, and naturally wish to have them shown to the best advantage. In number they are three, and here is a description of them: 1. Frame lantern slides.—This is a series of frame and mount designs which are used as cover glasses, a clear space being left for an ordinary landscape or portrait, which is made upon a lantern plate, registration being assured by the use of a mask in printing. The result on the screen is a view or portrait surrounded by a frame or design. 2. Design lantern slides.—A series of designs with a clear space for writing titles, notices, and other purposes. The writing or printing may be done on the design slide or upon the cover glass, or an ordinary lantern plate can be utilised printed from a negative. Landscapes and portraits can also be used with the slides. 3. Cloud lantern slides.—These consist of slides upon which are printed clouds ready to be bound up as a cover glass to a landscape. They are made in black and brown tones to match hydroquinone and pyro negatives, and other developers giving similar tones. By the use of these the amateur can do away with white skies in his lantern slides without the trouble of making cloud cover glasses or printing in clouds on his lantern plate. These adjuncts to the art of lantern-slide making are neatly produced, and we have no doubt that many makers will appreciate them. They emanate from a practical lantern-slide maker of great experience.

Studio Gossip.

We are sorry to learn that the well-known and respected photographer, Mr. Thomas Fall, of Baker-street, is confined to his house through illness. His many friends, we are sure, will join us in wishing him a speedy recovery.

THE GERMAN POST-CARD CRAZE.—"A novel and time-saving device has originated in Germany in the way of a postal card, the possession of which will deprive even the laziest of sojourners in lotus-land of any excuse for not communicating with their friends. One side of the card bears the postage stamp and the address. On the other side are printed words," says the *Daily Chronicle*, "followed by blank spaces for replies to the questions suggested. An example, with the replies made in one instance by the person who sent the card is as follows:—Arrived: Aug. 20. Society: Mixed. Health: Good. Scenery: Magnificent. Fun: Immense. Lodgings: Fair to middling. Weather: Showery. Money: Send me more by return. General remarks: Would like to live here. The pictorial post-card—the *Ansicht-Karte*—has

risen from a fashion to a craze and a mania in Germany. The average German's notion of a holiday is to walk up a hill and spend the day over beer and post-cards—'mit Ansicht.' This week's 'Simplissimus' touches off the mania very neatly with a picture of a man trussed for the guillotine. Chaplains and officials stand solemnly round. The executioner bares his arm. But the condemned criminal turns aside on the plank to write 'the last picture-post-card.'

BRITISH ART AT THE PARIS EXHIBITION.—The correspondent of a daily contemporary complains of the misrepresentative character of the British exhibits in the Grand Palais des Champs Elysées. It is a regrettable fact that many names, which in recent years have been instrumental in imparting strength and vitality to English art, are conspicuously absent. Nor is this state of affairs confined to the present Exhibition. Whenever collections of our national art are sent to the Continent, the executive, with amazing regularity, appear quite unable or unwilling to furnish a show which, by any stretch of imagination, could be called representative. Exhibition passes Exhibition, and the British section is invariably little more than the reflection of a typical academy. When this is of constant occurrence, and when almost every other nation in Europe makes strenuous efforts to give a characteristic and worthy reflection of the state of its contemporary art, I think, he adds, that the time has arrived when some attention should be drawn to the singular manner in which such things are conducted in this country. I am quite unacquainted with the names of the Art Committee or the means by which the gentlemen are appointed, but when those who are best qualified to judge, both here and on the Continent, deplore the inadequacy of the Exhibition, and agree in condemning it as among the worst sections in the whole Palace of Art, some idea can be gathered of the method in which the Committee has accomplished its task. Where other sections are marked with a catholicity of selection, embracing all societies, guilds, and institutions of repute, that of Great Britain goes no farther than Burlington House. Much of the art that is strongest and most vital in England at the present time flourishes outside the precincts of that institution, and it is indeed disappointing to find by far the greater proportion of space devoted to the type of uninteresting and mediocre work which is so prevalent within its walls. The dislike of true and sincere painting, unassociated with commercialism, should hardly extend to those who are responsible for our international art representations. It is as obvious as it is regrettable that men, who for years have been honoured on the Continent and everywhere in England but in the Academy, are most scandalously and unjustly treated in not being given an opportunity of showing their work, and one marvels at the outlook of those responsible persons who could draw out a list which contains so much that is meretricious and unnecessary, and so little that is true and sincere art. A careful selection of English paintings, embracing the Glasgow School and the New English Art Club (both unrepresented in Paris), could have brought together a collection that it would have been difficult to excel in any country, besides calling attention to many painters who, although not recognised as "official," are deemed by competent authorities to be among our greatest artists. Quite the same state of affairs prevails in the Applied Art Section, in the Esplanade des Invalides. Most persons are aware of the fact that during the last twenty or thirty years, there has been a strong movement in decoration and architecture in England, a movement which has had considerable influence on the modern development of these arts. Under the circumstances it would not have been unreasonable to expect that here, at any rate, every effort would be made to bring together a thoroughly representative collection. But the visitor searches in vain for the presence of those lovely exhibits of books, jewellery, stained glass, metal work, and furniture to which the Arts and Crafts Society has so long accustomed us, or for a thorough representation of our extremely beautiful and vigorous school of modern architecture. Without resorting to stronger language, it would be well within bounds to describe the condition of affairs as deplorable; and, after the repeated evidences of incompetency which characterise the management of our art exhibitions on the Continent, we may well question the advisability of intrusting our "official" art wholly and solely to the members and sympathisers of the Royal Academy.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, September 19, at eight o'clock. Mr. Max Henry Ferrars on "Method in Photography," illustrated by slides of Burma. Visitors welcomed.

MR. THOMAS MOORE. F.R.C.S., a leading surgeon at Blackheath, who had held many public appointments, and had made a special study of microbes, has died at his residence suddenly, at the age of sixty-two. Mr. Moore was also a deeply interested student of the Röntgen rays, and was treasurer of the Society.

MR. ALEXANDER WILSON. photographer, 11a, King-street, Whitehaven, died on Sunday, the 9th inst., in his forty-seventh year, from consumption. He was a member of the Whitehaven Council, and took a great interest in the town affairs, and his death has caused great regret in West Cumberland, where he was well known. Mrs. Wilson will still continue to carry on the business.

THE RECENT SOLAR ECLIPSE.—The report of the expeditions organized by the British Astronomical Association to observe the total solar eclipse of May 28, 1900, will be contained in a volume shortly to be issued from the office of *Knowledge*. The work will be edited by Mr. E. Walter Maunder, F.R.A.S., and will contain many fine photographs of the various stages of the eclipse.

A LOAN COLLECTION OF SLIDES.—The collection of lantern slides selected from members' competitions of the Borough Polytechnic Photographic Society has now been completed, and numbers about eighty. Full descriptive notes

and a brief criticism of each slide by one of the Judges will accompany the set, which is at the disposal of other societies free. Application should be made to the Hon. Secretary, Mr. P. C. Cornford, 103 Borough-road, S.E.

ACCORDING to a Dalziel's despatch, an alarming explosion occurred in the Rue du Mail, Paris, on September 3. Three employés of an illustrated paper were developing plates in the dark room, when one of them struck a match to light a cigarette. A jar of powdered magnesium was beside him, and at once exploded. The building was shaken to its foundations, the windows were blown out, and the inmates terribly frightened. When assistance was forthcoming, the three men were found lying senseless on the floor of the dark room.

PRIOR to the meeting of the Glasgow Corporation last week, members were invited to see specimens of the plague bacilli exhibited under microscopes in one of the committee rooms. A photograph was taken of one of the bacilli magnified to a thousand times, and accompanying it was a blood corpuscle magnified to a like extent. The corpuscle is about twenty times as large as the bacillus. The photograph will be utilised for a magic-lantern slide for use at the lectures given in the afternoon to the medical profession in Belvidere Hospital.

LANTERN SLIDES A RECRUITING AGENCY.—Under the auspices and with the ready assistance of the War Office, a lecture, illustrated with animated pictures and lantern slides, has been prepared, entitled "Our Army." It is descriptive of the life of a soldier from the day he becomes a recruit. The Commander-in-Chief is much interested in the movement for popularising the army. Two matinées will, therefore, be given on the 19th and 20th inst. respectively, at three o'clock, at the Polytechnic Institute, Regent-street, W. Admission will be by invitation ticket only, which may be obtained of Mr. Ernest Esdaile, Holly Lodge, Elmer's-end, Beckenham.

ONE of its most respected and prominent members has been lost to the City Corporation by the death of Mr. A. A. Wood, which occurred at his residence, 16, Finsbury-square. Mr. Wood became a Common Councillor in 1888, and enjoyed some of the highest positions the Council were enabled to offer him. He was Chairman of the Library Committee, the Guildhall School of Music Committee, and several others, and was the strongest opponent of the successful proposition of Alderman and Sheriff Sir William Treloar that the Guildhall Art Gallery should be open on Sundays during the Art Loan Exhibition. He was a member of the Dyers' Company and the Spectacle-makers' Company, and was on the advisory committee of the latter in regard to the examinations for the Company's diplomas.

THE UNIVERSITY OBSERVATORY AT OXFORD.—"F. R. A. S." in the *English Mechanic*, remarks that "the main thing which has occupied the Director and his staff during the year under review would seem to have been the measurement and reduction of the plates for the Astrographic Catalogue. At the date of the report, 736 plates of the 1180 required were measured, and 705 of them completely reduced. One very interesting result in connexion with these plates may well find mention here: In continuation of the investigation on optical distortion of a photographic doublet, Professor Turner has arrived at the conclusion that such distortion varies as the cube of the distance, if the star images form the centre of the plate. Should this prove to be really the exact law of distortion, very large fields may be employed for measures of great accuracy, as the reduction will be obviously very simple."

EXPERIMENTS WITH X RAYS IN AN ELECTROSTATIC FIELD.—"The well-known fact that light movable bodies, when placed in a Crookes tube, enter in movement under the action of the cathode rays, is used to support the hypothesis that these rays are formed of material particles moving with a certain velocity. Nevertheless," remarks the *Scientific American*, "it is remarked that the presence of cathode rays is not necessarily connected with the production of the movements, for these are observed to commence before the rays appear, and to cease when the rarefaction is pushed to a certain point, even though the cathode rays are still very intense. It is more probable that the movements are due to electrostatic action, especially if they are compared with those which have been studied by Groetly in the case of Röntgen rays. This experimenter disposes a very light movable body, carried on the point of a needle, between the two plates of a charged condenser. In this constant field the body remains at rest, but, when Röntgen rays are brought into the field, it enters into rotation, which lasts as long as the rays continue to act. With condensers of small dimensions and a movable arrangement formed by two discs of copper foil united by an insulating cross piece, the direction of rotation is found to change with the direction of the electrostatic field. The position of the tube emitting the rays also affects the sense of rotation. The two plates of the condenser are not indispensable in the experiment; they may be replaced by a small sphere, or even suppressed altogether, and the vanes placed in the air in the neighbourhood of a Crookes tube. The rotation is not a direct effect of the Röntgen rays, for it ceases when a sheet of ebonite or aluminium is placed between the tube and vanes, the rays still passing through this screen."

Commercial Intelligence.

GERMAN PATENTS.—During last year 21,080 patents were applied for in Germany, compared with 20,080 in 1898, and 18,347 in 1897. Of these, 7430 were awarded after examination by the Patent Office, the corresponding number during last year having been 5570. Thus, while the number of applications only increased by 3·7 per cent., the number of successful applications increased by 33·4 per cent. During the year, 5171 patents have expired or become void, and the total number of patents in force is 22,198.

AMERICAN AWARDS AT THE PARIS EXPOSITION.—Forty-two thousand seven hundred and ninety exhibitors out of 75,531 have received awards at the Paris Exposition. The United States obtained 1981 awards, of these 220 were

grand prizes, 486 gold medals, 583 silver medals, 422 bronze medals, 270 honourable mentions, and a long list of gold, silver, and bronze medals of collaborators. In the last Exposition only 1000 prizes, including those for collaborators, were given. The prizes were as follows: Grand prizes, 55; gold medals, 214; silver medals, 300; bronze medals, 246; honourable mentions, 229. The names of those who received grand prizes or gold medals have been made public.

AMERICAN *versus* BRITISH MACHINERY.—The following remarks of the British Commercial Agent in Chicago are quoted in the *Board of Trade Journal*: "In order to be able to turn out goods at such a rapid rate and in such large quantities, only machine tools of the very latest patterns are used. Every improvement and every invention by which labour may be saved or time economised, so that the resulting cost of manufacture may be reduced, is at once taken advantage of. In one large works which I had an opportunity of visiting, I found one man in charge of ten automatic machines, all working at the same time. Some were lathes turning small pieces, others were putting the thread on nuts and bolts, and many others. In this one shop there were fifty machine tools working, and in charge of only five men. It is not an unusual thing to see one man in charge of three or four of the ordinary small lathes. They are placed in such a position as to make this possible. Consequently, though wages are high, the actual cost per piece is very low on account of one man being able, thanks to these labour-saving machines, to turn out so much work. In one works I visited I was assured that ordinary labourers were being employed in place of skilled mechanics to take charge of some of the lathes and drilling machines, so as to avoid paying the higher wages of the more skilled men. They found it to answer perfectly, because, owing to the perfection in the construction of the machines, the work was almost automatic. Machine tools of British manufacture do not seem to be in favour in this country. The designs of some of the American tools are certainly very ingenious, and the work they do is exceedingly accurate. They also appear to run at a greater speed than the English ones."

Patent News.

THE following applications for Patents were made between August 27 and September 1, 1900:—

KINEMATOGRAPH.—No. 15,226. "Improvements in Kinematographic Apparatus." J. A. PRESTWICH.
DEVELOPING TRAYS.—No. 15,303. "Improvements in and connected with Photographic Developing Trays." P. HUNAEUS.
CINEMATOGRAPHIC APPARATUS.—No. 15,319. "Dark Slide for Revolving Disc Cinematograph Apparatus." W. H. H. PALMER.
CINEMATOGRAPHY.—No. 15,415. "Improvements in means to be employed in the Taking and Viewing of Cinematographic Pictures." G. F. HATTON.
PHOTO-MECHANICAL PRINTING.—No. 15,546. "Improvements in Photo-mechanical Printing." W. A. WORRALL.
FILM PHOTOGRAPHY.—No. 15,551. "Improvements in Apparatus suitable for Developing and Fixing Photographic Films and the like." S. QUINCEY.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
16.....	South London	{ Excursion: Chipping Ongar. Leader, C. H. Oakden.
17.....	Southampton	Print Competition : Seascapes.
18.....	Aintree	{ A Visit with the Cycle and Camera to some English Cathedrals. G. Harvey.
18.....	Bootle	{ The City and Port of Liverpool Thomas A. Dodd.
18.....	Brixton and Clapham	Demonstration: The Thornton Film. Walter D. Welford.
18.....	Croydon Microscopical	Ordinary Meeting.
18.....	Gospel Oak	{ An Amateur's Work and his Tools. W. J. Gorton.
18.....	Hackney	Members' Lantern Night.
19.....	Photographic Club	{ Method in Photography. Max Henry Ferrars.
20.....	London and Provincial	{ Lantern Night: The Paris Exhibition. A. L. Henderson.
21.....	Croydon Microscopical	Conversational Meeting.
21.....	Southsea	Paper: Lantern-slide Making.
22.....	Ashton-under-Lyne.....	{ Excursion: Mellor. Leader, Charles Taylor.
22.....	Borough Polytechnic	{ Excursion: St. Paul's Cray. Leader, F. W. Bannister.
22.....	South London	{ Excursion: Loughton. Leader, G. J. T. Walford.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 6.—Mr. Thomas Bedding in the chair.

Mr. WALTER D. WELFORD gave a demonstration of the new Thornton film and read a paper, the chief points of which are given on p. 566 in our last issue. The film is one of pure gelatine rendered insoluble and coated with emulsion, the whole being supported upon a transparent paper backing. Some of the qualities that may be mentioned are those of non-inflammability;

absence of curling tendencies; the purity of the gelatine film and its incapability to detrimentally affect the emulsion. It was stated that special developers were not with the Thornton film a necessity. Mr. Welford showed that density could be readily judged by transmitted light as are plates, the paper backing obstructing very little of the light. Some exposed films were successfully developed before the meeting, and members found no difficulty in stripping the dry negatives passed round from the paper backing. Left to themselves, the demonstrator said they would strip themselves more or less. As regards speed, he could say that during the week he had exposed several of the films at f-11 for one sixty-fourth of a second, with no sun. In reply to some questions, he said that P.O.P. prints from the films had as much quality as those from glass plates. He had also made lantern slides and projected them up to six feet without their suffering thereby in the matter of granularity at all. He claimed, indeed, that the films were very free from grain, and better in this respect than some plates. It was quite true that intensification or reduction had to be decided upon before the negatives were stripped, as they could not be properly dealt with after they left the paper backing.

Mr. A. L. HENDERSON asserted, in the course of some observations, that he could produce a similar film to the Thornton film. His challenge was accepted by the members, and the results are shortly expected. He criticised the fact that the negatives had to be treated with glycerine, which he thought would have a very staining tendency with papers very rich in free silver.

Mr. WELFORD said that he could not say that one print he had made had suffered from this cause.

A member present stated that he found most films on flexible supports tended to fog. Necessarily the coating of emulsion was thinner than was usual for plates; consequently one had to get the developer well through the emulsion in order to get sufficient density, and, if the material forming the support, or something in it, had caused fogging, the image would naturally suffer. He believed this to be the case with all emulsions coated on supports other than glass, which alone was inert.

Mr. WELFORD replied that the negatives he showed were in no way fogged. For his own convenience he had passed round spoiled films to show the stripping process. These were not negatives at all; many were exposed to light and developed for the purpose of showing the stripping. He thought Mr. Thomas was needlessly alarming himself about an unequal contraction of the film in drying, which he thought he had detected. The film he alluded to was printed from without the slightest trouble, and the films would be found, he said, particularly free from tendencies to unequal drying.

The meeting closed after some discussion as to practice of varnishing negatives, which Mr. Drage thought must be fast dying out.

PHOTOGRAPHIC CLUB.

SEPTEMBER 5.—Mr. Charles Wallis in the chair.

Mr. G. E. BROWN showed a simple toy that produced colour without apparent reason. It was devised by Mr. C. E. Benham, and consisted of a cardboard disc, mounted on a pin for an axle. One side of the disc was black, and the other white. On the white side were cut three radial slits, separated one from another by half an inch or an inch, and in a line with the central slit, the other side of the axle, was a device, lettering, or other mark, in black ink. If now the disc be quickly rotated close in front of a mirror, with the white side towards the glass, and strongly illuminated by a lamp, and the reflected image examined through the slits, zoetrope fashion, the three images formed should each appear of different colours.

Mr. BENHAM, in speaking of these spectral colour phenomena, said the effect was undoubtedly physiological, and the colours showed also in the light of a sodium flame.

Mr. BROWN said they were not really spectrum colours, as they showed in any light, yellow or white. The colours of the images are reversed if the direction of rotation of the disc be reversed. The members made efforts to see the phenomena to be expected, but the lighting was not very strong, although some detected faint tints.

A question was taken from the box, and it appeared that the writer desired to know how to proceed in an attempt to portray a night street watchman in his box, in front of a fire in a perforated pail, with a red lamp hanging by. The gist of the discussion was that the watchman should be photographed by artificial light placed some distance away so as not to come into the field of view, and the fire and rest of the properties exposed for again without disturbing anything.

Mr. SNOWDEN WARD asked how one would gauge the quantity required for such a case, and spoke of the value of a table of quantities of magnesium for different distances. It would be a great convenience if one could refer to a table for the precise amount of magnesium required to illuminate a room of given proportions.

Mr. F. A. BRIDGE did not think such a table would be altogether a success, for very often only half the magnesium was consumed. It depended entirely on the lamp used, and still more upon the width of a room, its height and colouring. It would not be sufficient to give the mere floor area; in fact, every case would have to be taken on its merits.

Mr. SNOWDEN WARD also asked what difference in light value was to be found between a given weight of ribbon and the same weight of magnesium powder, but the ratio was not known. So much depended upon the method of combustion, that figures would have very little significance. Mr. Ward alluded later to the flashlight papers—sheets of paper coated with a mixture of collodion and magnesium. It was specially mentioned with regard to these that they had to be kept quite dry, or combustion would not be perfect. Considerable time was devoted to the discussion of flashlight matters, and many reminiscences were detailed.

Croydon Camera Club.—An open meeting, preparatory to the winter season, which will commence on Wednesday, October 3, was held last Wednesday evening, the 5th inst., at the Club rooms. It was announced that the

steam launch excursion of members and friends from Hampton Court, on the 15th inst., was being well supported, about fifty tickets being already subscribed. Arrangements were made for an unusually interesting series of meetings for the winter, particulars of which will be duly announced. The season will attain its height with the opening of the fourth Exhibition on February 20, at the Art Gallery, when a brilliant display of photographic productions is looked for. During the evening examples of negatives obtained on the new Cristoid and on the Wellington films were shown. Mr. J. Noaks displayed a large and interesting assemblage of Convention prints taken at and about Newcastle. They included some very curious archaeological subjects. Other sets were shown by Messrs. Irving and Bryan, while Mr. W. H. Rogers exhibited "Pictorial Studies," of which several were well up to exhibition form, and one of which, *The Open Door*, will, no doubt, be further heard of. Messrs. Smart and Strickland were elected members.

Leeds Camera Club.—The opening of the winter session of the above Club, whose vitality and penchant for hard work is so well known in the North, took place on Wednesday, September 5, at the White Swan Hotel, Call Lane, Leeds, in the form of a social evening, interspersed with an address by the President. There was a good muster of members, considering the fact that at this time of the year there are so many amateurs holiday-making; but those present appeared full of zeal, which augured to make the prospective session a most successful one. A very pleasant feature of the evening was to notice so many of the old members gathered in the new premises. Since last session the Club have, it is, perhaps, to be regretted for many reasons, found it desirable to leave their headquarters, which have been for a long time past at the Grand Restaurant, Leeds, and have transferred their patronage to the White Swan Hotel, Call Lane, which, if the situation is not exactly all that could be desired, has an excellent suite of rooms well adapted for all the purposes of a photographic club, and it is intended to furnish the members with accommodation for developing and enlarging their own negatives. A new feature in the syllabus is the absence of competitions amongst the members, and in place thereof an exhibition of members' own work will be held late in the session at a *conversazione*, and those pictures which show either technical or pictorial merit will be purchased by the committee to form the nucleus of a permanent collection which it is intended to secure for the decoration of the Club's premises, and as a means of teaching the younger members what they should aim at. The President (Mr. R. Rust) in the course of a short address to the members, said that, if any one had ventured to predict he would be occupying such a position twelve months ago, he should not have believed him. He thought he echoed the sentiments and feelings of every member of the Club when he said that he could have hoped that the late Mr. W. J. Warren, whose sad death they all deplored, was working in his sphere amongst them. In reference to the position of the Club as it was to-day, he thought it would bear a fair comparison with previous years. There were on the books 135 members looked upon as *bond-side* members of the Club, and of which they had every reason to be proud. Referring to the syllabus, he expressed a hope that the way in which it had been sent out would meet with the approbation of every member present. As to the change of rooms, he wished it to be well understood that in coming there it was the best place at their disposal. The committee felt, in compiling the syllabus, they must have in view the capacities, desires, and expressed wishes of the members, and on perusing it could but come to the conclusion that it was of a very practical character from beginning to end. In conclusion, he hoped every member would work in the best interests of the Club, and set forth an ideal within himself which he would aim at, for the mutual benefits and interests of the members of the Leeds Camera Club. The enjoyment of the evening was much contributed to by songs, ably rendered by Mr. Watson, Major Norwood, and others, and accompanied by Mr. Ellison. Master Homburg gave several excellent selections on the piano. The health of the President was proposed by Mr. Homburg, and duly honoured. Next week is "Flower Photography," by Mr. Atkinson, one of the series of lectures instituted by the Yorkshire Photographic Union.

FORTHCOMING EXHIBITIONS.

1900.

Sept. 21–Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.

October 1–Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.

„ 17–20 Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.

November 7–10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.

„ 12–17 Ashton-under-Lyne.

„ 21–23 Hackney Photographic Society.

„ 22–24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.

1901.

January 14–19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
 ** We do not undertake responsibility for the opinions expressed by our correspondents.

A NEW LIGHT FOR THE STUDIO.

To the Editors.

GENTLEMEN.—The letter of Mr. A. A. Pearson is well timed and well placed, and the subject most useful, but there is one thing Mr. Pearson neglected to tell his readers, and that was what the saturator or carbureiser was charged with—ether, oil, &c. If he gave some idea of the cost per hour of such light he would still further contribute useful information.—I am, yours, &c.,

R. S.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.
 ** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.
 ** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

S. POWELL (Rushden).—A pleasing and well-executed photograph.

SALARIES AT CAPETOWN.—E. THORNE asks: "Could you say what salary they pay at Capetown to a good all-round assistant?"—In reply: A question it is impossible for us to answer. We insert our correspondent's query, as perhaps some Capetown reader may be able to supply the information.

DETERIORATED PAPER.—J. J. sends us some developed bromide prints, and wants to know the cause of the "fogged and stained appearance for half or three-quarters of an inch round the margins of them. They are all alike with this lot of paper."—The reason is that the paper is stale, and has evidently been made a very long time.

PHOTOGRAPHIC POST-CARDS.—W. C. BAX asks: "How can I produce view post-cards? I have been asked for them. I want to do them myself."—In reply: Perhaps the simplest plan would be to use the Velox cards specially prepared for the purpose. They are obtainable of Messrs. Griffin, Sardinia-street, Lincoln's Inn-fields, W.C.

PHOTOGRAPHING FRUIT.—T. SCOTT says: "I want to photograph some groups of fruit. Would you advise me to use orthochromatic plates and a colour screen? Also should the plates be backed?"—Yes; use orthochromatic plates and a screen, the depth of which should be governed by the colours in the groups of fruit. Unless the plates are thickly coated, they should be backed to get the best results.

ADDRESS WANTED.—F. VINER writes: "Can you supply me with the address of the people that make a speciality of doing the match-boxes with a view of public-house on, or a likeness of the landlord on same?"—Probably any collotype printer would do what you require. Crayon, Limited, 49, Brecknock-road, N., who make a speciality of war buttons and other small photography, would probably undertake your orders. Write to them.

RECOVERING GOLD FROM BOTTLES.—F. E. G. writes: "I have two old toning bottles in which the gold has accumulated on the sides and bottom until they look like pure gold from the outside. Will you kindly state how best to recover this?"—Drain the bottles and then pour in a little nitro-hydrochloric acid, one part nitric and four parts hydrochloric, diluted with one or two parts of water. That will dissolve the gold, which you will then have in solution to deal with in the ordinary way.

SILVER STAINS ON HANDS.—MESS writes: "I am trying the ferotype process, and I get my fingers and hands in a dreadful mess with the silver. Can you tell me how to get the stains off?"—The method usually adopted by wet-collodion workers is to wet the parts with water and rub them with a lump of cyanide of potassium, followed by pumice-stone. Another way is to treat the stains with tincture of iodine, followed by a solution of hyposulphite of soda. Of course, you know that the cyanide is a poison.

IDENTIFYING AN OIL PAINTING.—PHOTO-ARTIST writes: "Will you kindly tell me the best way to proceed to ascertain whether an old oil painting, which is supposed to be by an old master, is genuine or not? To whom could it be submitted, and what would be the fee? Any information you can give will be much appreciated."—The only suggestion we can offer is, that the painting be submitted to an established firm of picture dealers, such as Agnew & Sons, Bond-street; Graves, Pall Mall; or similar firms. We do not know their fees. Better write to them for the charge for their opinion.

FORMULA AND ADDRESS WANTED.—VARNISH writes: "1. Some time ago I saw a formula in the JOURNAL for making uninflammable celluloid; will you oblige by reprinting the same? 2. Also the address of firm that sells celluloid varnish."—1. Several methods, most of them patented, have been published for rendering nitro-celluloid uninflammable, but we cannot for the moment call to mind the one our correspondent refers to. 2. The Anglo-American Varnish Company, Birmingham, supply different kinds of celluloid varnish. The Vanguard Manufacturing Company, Maidenhead, also, we believe, supply a celluloid varnish.

PROCESS WORK IN GOVERNMENT DEPARTMENTS.—H. A. W. writes: "Could you inform me if the Government employ half-tone process operators; and, if so, where are the works, and what are the qualifications to get the berth?"—We are not sure that the Government do employ process workers direct. The police sometimes utilise process blocks for the apprehension of criminals, but whether they make them themselves or get them made we are unable to say. The photo-mechanical processes are largely employed at the Ordnance Survey Office, Southampton, and we are not aware if that process is worked or not. If it is, it would be worked by the Royal Engineers.

THE FLOATING-ON PROCESS.—BRUM writes: "Can you inform me where I can get to know the 'floating-on' process, as used by wood-engravers, or any other effective method of photographing on the wood?"—We do not know quite what you mean by the "floating-on process." Cannot you send us a little more information, as we may know the process, though not under that name? A collodion film may be detached from the glass and floated on to a wood block. Is that what you refer to? The carbon process is also used for producing photographs on wood blocks. The powder process can also be employed. Most of those who produce photographs on wood blocks for engravers keep the process they employ as a trade secret.

RED STAINS ON COLLODIO-CHLORIDE.—B. WALDE writes: "Could you let us know the reason of the red stains on the collodio-chloride paper, or how to avoid them, and how to mix magnesium powder to take photographs with at night?"—We do not know the red stains referred to; we ourselves have not experienced any. If you send us some examples, we shall be pleased to help you, but without seeing them we cannot. No mixture is necessary if you employ the magnesium in any of the lamps sold for the purpose. Several formulae for flashlight mixtures have, from time to time, been published, but they are all more or less dangerous in use. We should advise you to use the magnesium by itself in one or other of the lamps.

TONING P.O.P. WITHOUT WASHING.—NEMO writes: "I have lately been trying the effect of toning my P.O.P. prints without previous washing. After taking from the toning bath, transfer to a stop bath of dilute soda-sulphite solution, and, after that two or three changes of water, then to a formalin bath; wash again two or three changes, and then fix. Do you consider there is any danger in the practice as regards permanency of results? I find a decided gain in not getting any double tones."—We think it would be preferable to wash out the free silver and acid before the prints are put into the toning bath—though its composition is not stated—as by so doing all risk of sulphur-toning is avoided and toning by gold ensured. With sulphur toning permanence is doubtful.

RESTORING FADED PHOTOGRAPHS.—INVESTIGATOR writes: "In the *Revue Suisse de Photographie* I found the following formula for restoring faded photographs: A. Water 500 c.c.; chloride of calcium, 1½ grammes; carbonate of lime 5 grammes; chloride of gold and of sodium, 5 grammes. B. Tungstate of sodium, 50 grammes; hyposulphite of soda, 50 grammes; water, 500 c.c. Modus operandi: Immerse for ten minutes in solution A, say until the print reaches a rich purple tone; after this, immerse in solution B until disappearance of the yellow tint. By the present I wish to inquire whether, in your opinion, the quantity in solution A of chloride of gold and sodium is right or out of proportion, one gramme and not five being meant."—We cannot say what is meant, but five grammes seems a large proportion. It may be necessary, however. We have not ourselves worked with the formula. We should recommend our correspondent to try it with one gramme of the gold salt, and, if that does not answer, to try with the larger quantity.

VARIOUS QUERIES.—PYRO asks: "1. With reference to the City and Guilds Examinations, will you kindly let me know through JOURNAL what the advantages are in connexion with them, and where books are to be got from which one may study these subjects; also if classes are yet established in the vicinity of Liverpool? 2. Where can I obtain handbooks on purolume and crystoleum painting? 3. By what method is vignetting done in the camera? I find ground glass does not admit enough light to fog bottom of plate. Should the glass be of a certain colour—blue, for instance? 4. What kind of varnish is used for white-wood fancy work, and how is it applied?"—In reply: 1. The advantages of the examinations are obvious, not the least of them being that a candidate's knowledge of photography is tested. Get the complete book of Messrs. Whittaker, Paternoster-square; a list of photographic books to be studied is given in it. We know of no classes at Liverpool. 2. We are not aware that any are now in print on the subject, as that kind of painting is little practised. Several articles on the subject will be found in back volumes of the JOURNAL and also in the ALMANACS. 3. Different methods of vignetting in the camera were given on pages 163 and 211 of the JOURNAL for this year. 4. White wood is usually french-polished. White polish is to be had from all who supply french polish and varnishes. A special white varnish, to be applied with a brush, is also supplied by them.

** A number of reviews, answers to correspondents, and other matter are unavoidably held over.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

The fortieth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1516 pages, and, as was the case in 1899, the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1901. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their MS. sketches, &c., at the earliest possible date.

Secretaries of societies will oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

We have received the prospectus and time-table of the sixth session, opening on Monday, October 1, of the London County Council's School of Photo-engraving and Lithography, 6, Bolt-court, Fleet-street, E.C. The prospectus states that "the object of the school is to give instruction in the craft of producing surfaces for printing. Of the various classes held some are concerned with the more artistic side of the work, others with the technical; there is, however, no real line of demarcation between the two, either in intention or practice, and the division is made solely for convenience of teaching. Instruction is given in drawing, design, lettering, lithography, elementary photography, photographic copying, and the chief photo-mechanical processes. The school is open to those who are genuinely engaged in business in any branch of the photo-

mechanical, photographic, designing, lithographic, engraving, and printing crafts, and no provision whatever is made for amateurs. In some cases the classes are confined to those who are directly engaged in the particular branch taught. The Technical Education Board is open to consider applications from parents who intend placing their sons as apprentices to any of the above trades, and who may be desirous of giving them the advantage of a preparatory school training; but it is to be understood that such students must be duly apprenticed within some period to be arranged." The photographic classes include most branches of process work, the fees are reasonable, and the facilities for study and practical work exceptionally good. Any further particulars concerning the instruction and work of the school may be obtained either by personal application or by letter to the Principal of the School, 6, Bolt-court, Fleet-street, E.C., or to the Secretary of the Technical Education Board, 116, St. Martin's-lane, W.C.

* * *

MANY photographers will shortly be preparing lantern slides for the forthcoming season; therefore we may remind them that the beauty of most pictures is enhanced by the introduction of clouds, presuming, of course, that the clouds are suitable to the landscape. Often when clouds are printed from stock commercial negatives they are used without discretion, and the result is ludicrously incongruous. We again allude to this subject because just now is about the time of the autumnal equinox, when gales may be expected, and good cloud effects may be said to be "in season." Therefore those who have not already a good stock of cloud negatives for their winter work should embrace the opportunity, and lose no time in securing them. As a rule, when the amateur takes cloud negatives for stock, he takes them far too near the zenith, and in such a position as they would never be seen in if a landscape were taken with the clouds included, hence they do not harmonise if afterwards used for one. Discretion must be used both in taking cloud negatives and in using them. It would be eminently incongruous to use heavy stormy clouds, which may be shortly expected, for a serene sunlit landscape, though it is too often done; but towards the end of this month and the beginning of next almost any variety of cloud negatives may be obtained. The best position from which to take the negatives is an eminence, or, better still, the seaside, as these may be secured near the horizon without including trees, housetops, and the like, and also be at about the same elevation as they would generally be if included in a landscape picture. The opportunity of easily securing good cloud negatives if lost during the next few weeks must be waited for till next year.

* * *

IN our issue last week we quoted the number of patents applied for in the German Empire during 1899. It was 21,080. Of this number 7430 were awarded, after examination, by the Patent Office. The German Patent Office is conducted on quite different lines from the English Patent Office. In Germany a patent is not granted until the Patent Office has satisfied itself, by examination, that the invention is really original. Even then the patent is not granted unless the invention is of real public utility. Patents are not available for frivolous things. Here a patent is given for the most trivial idea, or for others that may be as old as the proverbial hills. The money is taken, no questions asked, and the patent sealed—not that it may be valid, for the patentee may afterwards find, perhaps after costly litigation, that his invention has been

anticipated. But he will get no redress from the Patent Office, not even the fees back that he has paid. It will be seen from the above figures that, after examination, not much more than a third of the patents applied for were awarded. It may reasonably be taken for granted that, when a patent is given in Germany, it is a valid one there, and that a patent for the same invention taken in any other country is also valid. We wish that the same thing ruled in our Patent Office, so that the patentee, after paying the fees, had a reasonable guarantee that his patent was a valid one.

* * *

THE season is now coming on when artificial light will be invoked by many photographers. Already we have been asked for formulæ for flashlight powders. These we look upon as being all more or less dangerous, particularly in the hands of those who are unacquainted with their properties. In our News and Notes last week we quoted a dispatch from Paris to the effect that three *employés* were engaged in developing some dry plates when one of them struck a match to light a cigarette, and "a jar of powdered magnesium beside him at once exploded." The windows of the building were blown out and the three men were rendered insensible. Now, it is hardly conceivable that the jar contained magnesium powder by itself, to explode and cause so much damage, or to light so easily while in a jar. It is more than probable that the magnesium was mixed with one or other of the oxygen-forming compounds so much used in flashlight powders, and which are so dangerous to handle in large quantities. The components of these flash powders are all harmless enough when kept separate, and it is only when mixed together that they become dangerous compounds to deal with, as they are liable to "go off" when least expected, some spontaneously. We call attention once more to this subject in order to caution those who may be contemplating the manufacture of flashlight powders for themselves. In all cases where these powders are used the different components should be kept separate and only mixed at the time of using, and then only with the greatest care, using a piece of paper or cardboard to mix them, and only sufficient for a single flash should be taken at a time.

* * *

SOME photographic societies and clubs possess apparatus which any of the members can borrow for use at home when not required at the meeting. Notably is this the case with lanterns; but, till now, we were unaware that any society made it a business to let them out on hire to the outside public. It would seem, however, that at least one does so. The Brentford Photographic Society evidently have an eye to business. A correspondent sends us the following paragraph from the local paper: "LANTERN SLIDES.—With regard to the notice we published recently about slides for lantern lectures, lent by George Newnes & Co., it may be added that any one wishing to use the lectures may hire a lantern and acetylene generator or lamp from the Brentford Photographic Society at a moderate cost." It is not stated whether the Society also undertake to supply an operator to manipulate the light, &c. Professional photographers have often complained of the alleged injury done to their business by amateurs. What will local opticians, who make a feature of letting out lanterns and slides for hire, say if it becomes a practice with the Society to compete with them in their business? However, we surmise that the example set by the Brentford Society is not to be followed by any other photographic society.

WE are indebted to Mr. John W. Glenny, of the Far East Studio, 1, Campden Hill-road, Kensington, for the opportunity of inspecting a number of Japanese photographs, chosen from a considerable collection for which he is the agent. Mr. K. Tamamura, of Nos. 2 and 16, Bentendori, Yokohama, is the photographer, and we gather that this gentleman produces coloured views, portraits and lantern slides. Of the first two kinds, the specimens before us are exceedingly good, the hand painting, for such it appears to be, being minute and tasteful. A collection of about twenty-four little pictures, bound up in book form, is entitled, *A Leaf from the Diary of a Young Lady*. The photographs, with brief descriptions in English, illustrate the domestic and social doings of one of those alluring little creatures to whom such sympathetic references were made in the article we printed in the JOURNAL of the 7th inst. As examples of interior and group photography it is difficult to convey an idea of the excellence and charm attaching to these productions, while the colouring, presumably partly hand and partly mechanical, is very tastefully and tenderly done. We have been altogether highly pleased with these examples of Japanese photographic work. Those interested may, doubtless, find Mr. Glenny, at the address given at the opening of this paragraph, willing to exhibit specimens.

IMPERFECT FIXATION WITH REFERENCE TO STABILITY.

IN concluding the article on "Imperfect Fixation," a few weeks back, we intimated that we should possibly recur to the subject with reference to the fixing of silver pictures. The previous article was chiefly confined to spots and stains, apparent when the prints were finished, or which made themselves apparent soon afterwards, arising either from careless manipulation, or, in too many instances, from lack of knowledge on the part of those into whose hands the work was put to be done without proper supervision. On this point, in the article, we thought it necessary, in the interest of photography itself, to make some rather strong comments, more particularly with reference to some photographers who take apprentices while they themselves are quite ignorant of even the elementary principles of their craft. That some do so is evidenced by the fact of the queries we from time to time receive from professionals as to the causes of stains, markings, spots, &c., which any one possessing but a superficial knowledge of his craft could at once locate at a glance when seeing the work in progress. But the queries clearly prove they are unable to do so; hence our strictures.

In the present article we propose to deal with the fixation of silver prints as affects their stability. A very general impression is rapidly gaining ground, not to the credit of photography, that silver prints are bound to fade after a few years, and that fading must occur as a matter of course, and we regret to say that many modern silver pictures tend to substantiate it. In face of that idea, however, is the fact that there are thousands of silver prints still intact that were made forty or more years ago. If such prints were produced then, why, with our improved knowledge of the chemistry of the subject, are such pictures not produced now? On former occasions we have pointed out the difference in conditions prevailing then and now, and it is not necessary to dwell upon them again here. We shall simply now confine ourselves to

the existing conditions, for, as they are, they do permit of the pictures being made, if not absolutely permanent, far more stable than the majority of them are at the present time, if more care and judgment were expended in their production. In many cases, when pictures fade, after a year or two the fading is frequently attributed to the mounts, or that they have been imperfectly washed, &c., while the real cause has been simply imperfect fixation. As we have said many times before, unless a print, whether albumen or gelatine, is properly fixed in the first instance, no amount of after-washing will rid it of the hypo salts of silver.

Recently the question was publicly discussed as to how one is to know when a negative is properly fixed. In the fixing of a negative we have some sort of a guide in the appearance of the film, and, if the plate be left in the fixing solution for the same time again as it took for the white bromide of silver to disappear, the negative may be considered, to all intents and purposes, to be properly fixed.

With paper pictures we have no such ocular guide. How, then, can we know when they are properly fixed? This query, we are reminded, was one put on one of the City and Guilds' examination papers some few years ago, but the propounders of it were unable to answer it themselves. With albumen paper it used to be assumed by some workers that, when a certain amount of mottling, seen by transmitted light, disappeared, the prints were fixed; but, if the view taken of the fixing of a gelatine plate be correct, this was an inefficient fixation; hence, perhaps, a cause of fading. The only practical way we know of ensuring perfect fixation with paper pictures is to make sure, by overdoing it rather than underdoing it. No harm comes from that. The way is to employ plenty of hypo, and allow plenty of time for its action. This salt is cheap enough, though it is too often stingily used.

We once heard an employer complain that his printer, though an excellent hand, was very extravagant with the hypo. At the time we thought, and said so, that this was a high commendation of his ability. We may mention that, in our opinion, the formulæ for fixing baths issued with some brands of paper are, with the time given for immersion, far too weak to render the pictures stable, particularly when they are compounded as "acid fixing baths."

The strength we always use and recommend is four ounces of the salt to each pint of water, and the time of immersion not less than fifteen minutes. Under these conditions one can ensure that the insoluble salt of silver formed by the first action of the hypo is converted into the freely soluble salt, which is readily washed out by water. This strength and time of immersion may not be absolutely necessary, but it will undoubtedly ensure the pictures being thoroughly fixed. The quantity of solution is also a factor in the case, for if only a small bulk of the solution be employed, or if it is used for more than one batch of prints, its action will be weakened, and the conditions altered. It goes without saying that the prints should be kept separated and in continual motion while they are in the solution, otherwise it will not have a free and equal action. In all cases the hypo should be weighed and the water measured, and the bath not be compounded, as it frequently is, by so many handfuls of hypo to a pitcher of water. "Handfuls" are a very inconstant quantity.

The case of bromide papers is somewhat different from that of printing-out papers. In the former there is only the gelatin-bromide of silver on plain paper to be dealt with, and a shorter immersion than that mentioned above will suffice. Not so,

however, with the latter, because here we have, in addition to the haloid, free nitrate of silver, and also a substratum on the paper—the baryta coating—which is held to the paper by a vehicle of some kind, such as gelatine, starch, or flour paste, in an insoluble condition. Now, the free nitrate of silver may, and there is no doubt that it does, combine with that and forms an organic compound of silver, as in the case with albumen paper, which has to be got rid of by its being converted by the hyposulphite of soda into a soluble condition, for, if any of it remains in the paper, it will eventually darken by continued exposure to light, as witness many gelatine prints to be seen in show-frames. As the baryta coating is practically insoluble in water, the action of the hypo is chiefly confined to the front, and takes place through the gelatine as with a glass plate; therefore a longer time must be allowed for its action than is necessary with bromide papers. As we have said before, and as it is so very cheap, hypo should not be grudgingly used where permanency of the results is a consideration.

We intended to have said something on the washing of the prints, after fixation, and the effect it may, or may not have on the permanency of silver pictures, but that must be deferred till a future occasion.

The Apotheosis of Scientific Photography.—This is not an extravagant mode of describing the purport of Dr. Common's inaugural address at the British Association meeting in the Department of Astronomy in Section A. Comparing the report of Sir G. Airey, to be found in the very first volume of the Proceedings of that body, upon the progress of astronomy up to that date, with what has since been achieved, he said, "What has aptly been termed the new or physical astronomy did not then exist," and he "proposed . . . to allude briefly to the new astronomy, and to speak rather fully about astronomical instruments generally and the lines on which it is most probable future developments will be made." He described the various improved forms of instruments and appliances now in general use, but the chief motif of his remarks was photography, and what it had done for astronomical science and progress. Incidentally he repeated some old observations of Sir David Brewster in connexion with solar and stellar lines. Part of the quoted words may well bear repetition here: "Lenses of large diameter, accurate heliostats, and telescopes of large aperture are absolutely necessary for this purpose; but, with such auxiliaries, it would be possible to construct optical combinations, by which the defective rays in the spectra of all the fixed stars down to the tenth magnitude might be observed, and by which we might study the effects of the very combustion which lights up the suns of other systems." All these requirements have long been met. Brewster's remarkable and prophetic words have been realised. The invention of Bunsen and Kirchoff, the spectroscope, was not made public till years after (in 1859), yet here is, undoubtedly, the germ of their discovery; the use of photography alone, by which all these great observations are now recorded free from all errors of personal equation, was the one thing he had not foreseen. Dr. Common points out how Daguerre's invention was at once utilised, J. W. Draper, the two Bonds in America, Warren de la Rue in this country, and Foucault and Fizeau in France, being the pioneers of celestial photography which was so closely bound up with the progress of the new astronomy. Dr. Common proceeded to indicate the lines on which probable future large telescopes would be built. They would be fixed instruments with a large mirror of concave figuring—six feet has already been accomplished—and six or seven feet as a beginning should easily be achieved. There is here a point of considerable practical interest to photographers who use plane mirrors. Every one knows the trouble of resilvering them, but Dr. Common says that "now we have a method of silvering mirrors that is certain, quick, and cheap," though "up to quite recently the silvering of any five-foot mirror was a long,

uncertain, and expensive process." The whole address is replete with matter interesting to every scientific photographer, and should be read by all.

Two New Spectrographs.—Dr. Vogel, in the *Astrophysical Journal*, describes two new instruments supplied to the Potsdam Observatory for use with the great refractor there. There is a three-prism spectrograph, giving a deviation of 180°, which involves the camera and the collimator being almost parallel to each other. The latter has an aperture of 3·2 cm. and 48 cm. focus. The lenses chosen are an astigmatic photographic lenses by makers well known for their photographic optical work. The prisms are of very white Jena glass, and its spectrum has a uniform focus from b to x. Then there is a single-prism spectrograph, with a still larger collimator, and its camera is supplied with a photographic objective; the spectrum is uniformly sharp from d to n. Here, again, the use of lenses originally designed for high-class photographic work enables instruments to be constructed which would have been much inferior for the purpose if made prior to the introduction of anastigmatically corrected photographic lenses.

A New Light.—At a recent meeting of the Paris Academy of Sciences, M. Raphael Dubois read a paper on lighting by the cold physiological light called Living Light. This is a very remarkable phenomenon, which undoubtedly could be made to perform photographic work, though no details in that direction are available in the abstract before us. Full descriptions are given in the original paper as to how to set about the production of the light. Briefly, they consist in cultivating certain organisms in a special medium found suitable for them. It is stated that light is produced sufficient to illuminate a whole room with a soft lambent glow about equal in strength to moonlight.

Photographers and Railway Companies.—In reference to a recent paragraph under News and Notes, a correspondent writes us, saying that it is eminently characteristic of railway management that the unfortunate photographer who applied to the Great Western Railway Company for work was given something he was unfitted for, and not something which he could do well. "The photographers," he adds, "who are employed in some railway works are another illustration of the same principle. Frequently they are enlisted from the ranks of labourers, given the opportunity of learning what they can from books and by practice, and duly installed in the works studio. There would be no objection whatever to the Company pursuing this course, but it occasionally arises that they call in professional aid outside their own employés. Any photographer who thinks of taking such a post should first ascertain what his official position is to be, or he may find himself under the supervision of a man who is infinitely his inferior in ability, and who will be glad of the chance to get rid of him when he has learnt what he can from him. The same thing may be said to parents sending their boys as improvers or apprentices in the studio of a railway company. There are notable exceptions. For example, the Midland Company had Mr. Thomas Scotton for many years, and now his son, and the London and North-Western possess a staff which turns out very fine work, but it may be taken that in most cases the berths of photographers to the railway companies in this country are not worth having, and that those who are in them only stay there because they find it difficult, with their curious, one-sided knowledge of the craft, to get a place anywhere else. Wherefore the company can pay them wages which an outsider coming in to do the same work would refuse, which, again, is typical railway company policy."

"Dartmoor Illustrated."—The distinctive feature of the book bearing this title, which is published by Mr. James G. Commins, of 230, High-street, Exeter, is that it consists chiefly of phototypic illustrations, placed by themselves apart from the brief descriptive notes which preface the volume. The hundred photographs are separately printed on full-page paper. In a

publisher's note Mr. Commins remarks: "The ever-increasing interest displayed in Dartmoor and its antiquities, and the success and general approval which attended the publication of the third edition of the *Perambulations of the Ancient and Royal Forest of Dartmoor and the Venetian Precincts*, edited by Mr. J. Brooking Rowe, F.S.A., has induced the publishers to make arrangements by which the value of that work may be very considerably extended; he has accordingly decided to issue a series of one hundred illustrations of the scenery and antiquities of Dartmoor, to be executed in the best possible manner, and printed on the finest art paper from photographs taken especially for this work by Mr. T. A. Falcon, M.A., whose knowledge of, and interest in, the Moor has been of the utmost value." *Dartmoor Illustrated* forms a handsome book, and Mr. Falcon has done his photography exceedingly well, while his notes are pithy and clear.

AIDS TO RAPID SOLUTION.

THE making of solutions is so constant and necessary a part of the photographer's routine that we give here a few expedients which are set down here also for the information of those who may be contemplating the preparation of dry developers, &c., to be dissolved by the purchaser.

We are afraid it is still necessary to point out that the usual custom of putting salts in a bottle or jug, pouring the water over them and occasionally stirring the mixture, is a very bad one from the point of view of speed. The liquid at the bottom becomes saturated, but the water in the salt does not get a chance to exert its solvent power. The theoretically right principle, which is likewise easy in practice, is to suspend the salt near the surface of the liquid. This can be done in several ways. A muslin bag is perhaps the simplest receptacle. A bottle with the bottom cut off (easily done with a piece of hot iron) and a piece of muslin tied over the mouth is another. It is hung inverted in the vessel containing the water. By marking the side, the solid to be dissolved can be measured instead of weighed.

Mechanical agitation of the solvent and the solid is generally bad from the photographic point of view as leading to aeration of the solution. When the solution is not of sufficient volume to make a top-solution method advisable, it is best to powder the salts as finely as possible, and mix them with the water (preferably heated) by stirring. This matter of powdering is perhaps neglected by those referred to above who supply ready-mixed preparations. Our experience of some of these shows us that the makers have not taken means to ensure a uniform fineness of division. Neglect of this is serious, because the large particles remaining delay the process of solution, which, when they are present, occupies many times the period required to dissolve the bulk of the powder. The only way to obtain perfection in this respect is to sift the powdered mixture and repowder that portion of it left behind, repeating this process until the whole passes completely through the sieve.

Increase of temperature accelerates the solution of almost all salts, but it should be noted that some are thereby altered in composition. Among these are sodium bicarbonate (which changes more or less completely into sodium carbonate), potassium metabisulphite (which loses sulphurous anhydride), and Schlippe's salt.

Some salts, such as borax, hypo, alum, potassium oxalate, dissolve much more freely in hot water than in cold, whilst in the cases of others (e.g., salt) there is little advantage in employing heat. A glance at the solubility tables in the ALMANAC will inform the reader of the property of any given salt in this respect.

Another and little-recognised aid to solution lies in the use of anhydrous salts. An anhydrous salt is one containing no water of crystallisation. Thus mercuric chloride, $HgCl_2$, is anhydrous. It must not be supposed that the mere fact of a salt being anhydrous is any indication of its solubility. The interest of the anhydrous salt appears only when we compare it with the same salt, but combined with water of crystallisation. Thus sodium carbonate crystallised has the composition $Na_2CO_3 \cdot 10H_2O$. The anhydrous salt is, of course, Na_2CO_3 . The importance of this, from the point of view

of rapid solution, is that the majority of anhydrous salts raise the temperature of the water when they dissolve, whereas most hydrated salts lower it, some much, some little. On the Continent, anhydrous sodium sulphite is considerably used, though in this country the anhydrous salt rarely appears in formulae. Probably anhydrous sodium carbonate has been made more prominent than any other anhydrous salt through the advocacy of it by Mr. Chapman Jones in formulae for developers.

Most of the salts used in photography can be converted into the anhydrous or dry form by heat. The temperatures at which these take place are as follows for a few of the most used substances:—

Salt.	Temp. (°C.)	Remarks.
Sodium thiosulphate.....	215	Begins to decompose at 220°.
Sodium sulphite	150	
Potassium carbonate.....	130	
Sodium alum	40-50	
Copper sulphate	220-260....	Loses 4 of its 5 molecules of water at 100° C.
Sodium phosphate.....	100	

In most of the cases given above the temperature must be kept within a degree or two of that given. If it fall below, dehydration will not be complete; if it rise much above, other decompositions will set in.

On the semi-large scale the salts are rendered anhydrous by exposure in an oven heated to the temperature required, which must be indicated by a thermometer. An apparatus for a similar purpose, which may serve as an idea for some of our readers, was described by G. P. Drossbach in the *Berichte* of the Berlin Chemical Society not long ago. It consists of a wide tube, which is heated by a furnace. It is provided at one end with a hopper, for the introduction of the powdered substance, and contains the Archimedean spiral, the axle of which runs loosely in the constricted end of the tube and in a bearing at each end. As the material is worked forward by the spiral it is continually turned over, and, before it reaches the exit end of the tube, is thoroughly ignited. Any gas in which it is desired to conduct the ignition is led into the apparatus at the constricted end, of the tube. The apparatus as thus described is intended for the ignition of minerals, &c., but, by arranging insulating media such as asbestos between the source of heat and the tube, and by passing a brisk current of dry air through the apparatus, it could serve as a dehydrating chamber.

Lastly, there are chemical aids to rapid solution, viz., chemical substances which, innocuous to the action of the substance to be used as a photographic reagent, yet aid its solution. There are not many examples; the only one that occurs to us as we write is ammonium chloride, an equal weight of which, added to powdered mercuric chloride, makes the latter salt dissolve very readily.

ON THE RECENT PROGRESS IN DIRECT PHOTOCHROMY.

II.

DIRECT METHODS OTHER THAN LIPPMANN'S. THEORY OF INTERFERENCE PHOTOCHEMISTRY.

HERR DITTMAR* discovered that a film of fuchsine, methyl-violet, or other aniline colourings, with thymol or some other phenol derivative, is sensitive to light, and stated that a plate or paper coated with a thick layer of this aniline colour, and exposed to light under an ordinary negative,† produces a coloured print. The mixture recommended by Dittmar was: Wood spirit, 350 grammes; fuchsine, 30 grammes; thymol, 8 grammes—boiled together, filtered hot, and poured on to previously warmed plates. After spontaneous drying, the plates must be warmed rather strongly to get rid of the tendency of the coating to be sticky, and to make it mirror-like and lustrous. The plates will then keep for months.

Neuhauß‡ used the mixture recommended by Dittmar. The thymol-fuchsine, even after exposure to sunlight for some seconds, gives a faint picture on development with cold water. Gelatine-fuchsine is also sensitive to light, becomes rather darker after exposure, and gives swelled reliefs.

* Deutsche Phot. Zeitung, 1897, p. 340.

† Better, a positive transparency, and in direct sunlight for some hours.

‡ Phot. Rundschau, 1898, p. 291; a short account in Am. Phot., Oct. 21, 1898, p. 834.

If a thymol-fuchsine plate is exposed for several days to direct sunlight, until its surface becomes violet-black, and is then exposed again for several days in the sun under a coloured diapositive, a reproduction of the transparency in true colours appears. In Neuhauss's opinion, this is a confirmation of Wiener's theory of pigmentary colours.* Under the influence of red light, the red colouring materials present in the film reflect the red rays, and consequently are not changed. The rest of the colouring materials present at the same spot absorb the red rays, and therefore fade; and thus the red colouring matter alone remains. In this way the print reproduces the colours of the original plate.

Returning to Dittmar's process, after development the plate is immersed in a half per cent. solution of caustic alkali, and then in chlorine water or chlorinated soda, and exposed to the air. Then, and not till then, do the colours gradually appear; in the first bath the image merely darkens. The chlorination and exposure to air may be repeated until the desired colours are obtained. Neuhauss's experiments pointed to untruthfulness of the colours.

L. Delvarez,† starting from the facts that (1) a brass plate, used as anode in a mixture of the solutions of lead and copper acetate, becomes covered with rings of colour caused by the formation of thin films of an oxide of lead; (2) one of two silver or copper plates in an electrolyte exposed to light causes an electric current dependent in strength on the intensity of the light;‡ concluded that currents arise between two spots of the metal plate which are differently exposed and cause the electrolysis of the lead-copper-acetate solution, thereby producing colours. In an experiment a red object after an hour's exposure produced a red colour on the brass plate. A shadow of a leaf on the back of the plate in full sunlight gives a visible silhouette in ten minutes, and, with a photographic negative, different colours are obtained, but according to the depth of the shade. The plate may be well washed and dried, but the image alters (very slowly) in the light. The whole effect is unsatisfactory and indistinct, but, if looked at through a red glass and at a certain angle, it appears distinct and with almost correct colours.

From the sentence which I have italicised it appears exceedingly improbable—as, indeed, one would almost be justified in judging *a priori*, from the stated foundations of the method—that this is a process of photochromy in the true sense. It might become so only if the intensity of the current in Becquerel's experiment bore a relation to the wavelength, instead of (as it apparently does) only to the intensity of the incident light. Finally, it may be remarked that there is not much difficulty in formulating processes which will give colours which depend on differences of intensity of light, e.g., differences of density in a monochromatic negative; but evidently such colours will be correct only in very special cases.

Turning now to work on the theory of interference photochromy, Herr A. C. Kitz§ argued that two images are found in Lippmann's process, the one direct and the other due to the mirror. The former may be similar in character to the interference effects on Becquerel plates (Wiener), or in a film containing silver particles (Graby). Neuhauss,|| in his above-cited paper, spoke unfavourably of Kitz's attempts; stationary waves arise by reflection from flat mirrors, not from reflecting particles in the film.

Finally, with respect to the history of the principles of direct photochromy. During the present year the work of Zenker—the originator of a principle which was afterwards made by Lippmann the foundation of an actual process of interference photochromy—has been made generally accessible by a new edition of his *Lehrbuch der Photochromie* (1868) in good (*i.e.*, better than the original) type and additions—a sketch of the further development of interference photochromy, a life, and even a portrait of Zenker.¶ The sketch of the development of direct photochromy on Zenker's principle, though admirably done in all respects but one, is, as I have already indicated elsewhere,** lacking in mention of Lord Rayleigh. The importance of this omission lies in that the part played by Rayleigh forms an absolutely essential link in the development of interference photochromy. I shall endeavour to show this on another occasion. Briefly put, it lies in the following short history of inter-

* Wied. Ann., 1895, vol. ii., S. 225-231.

† Communication to the Académie des Sciences de Paris; Bull. de la Soc. Française de Phot., Sept. 15, 1898, p. 451; Phot. Wochenschrift, 1898, S. 364.

‡ Becquerel and Rigolot.

§ Eder's Jahrbuch, 1898, S. 61 from Phot. Woch.

|| Phot. Rundschau, 1898; see extract in Am. Phot., Oct. 14, 1898, p. 814.

¶ I may also mention that, before the publication of this new edition, I felt the necessity of paying attention to Zenker's work (especially for photographers, his methods), and gave a rather full account of the *Lehrbuch in Camera Obscura* (during the past year), with the addition of a development, first sketched briefly in THE BRITISH JOURNAL OF PHOTOGRAPHY, from Zenker's principle, of a general "principle of position"—a fundamental view of physical methods of direct photochromy.

** In a recent review of the above new edition in *Nature*.

ference methods. To Zenker is due the principle, to Rayleigh is also due independently the principle and also the idea (lacking with Zenker) of transition from principle to method: to Lippmann is due the fine method.

PHILIP E. B. JOURDAIN.

THE PHOTOGRAPHIC METHOD OF PREPARING TEXTILE DESIGNS.

[The following is an abstract of a paper read at the recent meeting of the British Association by Professor Beaumont. A fully illustrated description of Szczepanik's process appears in THE BRITISH JOURNAL OF PHOTOGRAPHY of February 9, under the heading of "Photography in Weaving."—EDS.]

The preparation of designs for the loom has, throughout the history of weaving, been regarded as a purely manual process controlled by the intelligence, ingenuity, and skill of the craftsman. It is only natural, therefore, that the invention of apparatus for this specific purpose should have created much interest amongst both British and foreign textile experts. Photography, as understood and practised, appeared as incapable of aiding the artist in the actual painting of his picture as the designer in the transference and execution of the plain sketch of the pattern on to the "scale" paper for the loom. Within the wide range of technical and scientific data in the construction and embellishment of woven fabrics there is, perhaps, no phase of the work more difficult to assail, by mechanical devices, than the application and adjustment of the manifold "weave" units which compose all figured textiles.

Design acquired in the loom is a distinct type of ornamentation involved in varied technicalities. It is not the result of one, but of a number of processes, overlapping each other, and yet uniting to construct and perfect the same woven effect. Fabric and design have to be simultaneously obtained. These can only be divorced by resorting to the arts of printing, embroidery, and painting. Obviously, in the preparation of the "design" sketch for weaving, numerous limitations have to be encountered, which, on a first consideration, seem liable to be increased rather than diminished by a photographic process of design-development. Much ingenuity has been exercised by Szczepanik in his solution of these "weave" problems. Szczepanik's apparatus is not for the origination of designs either in the theoretical or technical form, for in both processes the knowledge of the expert are demanded; but its province is to lessen, and, in some instances, dispense with, the monotonous manual labour necessitated by the present system. There are large areas of point paper in elaborate design to which the same weave effect has to be applied, and where some labour-saving device is much needed. Further, in the enlargement of the artist's sketch to scale there is much mechanical work that it ought to be possible to reduce. The photographic inventions of Szczepanik profess to accomplish these objects, and the designs submitted prove that there are possibilities of success in certain styles of pattern. A new field for experiment has been discovered, the extent of which it is not possible to forecast, but it may reasonably be anticipated that the genius and temerity of the discoverer will prove equal to its more complete exploration.

The essential purpose of Szczepanik's invention is to develop from the ordinary sketch and enlarge to a prescribed scale the technically prepared design, marked with the thousands, or may be millions, of dots grouped in different orders, and so fitted together as to impart precise definition to the several portions of the woven figure or design. The process is threefold, consisting (1) of the preparation of the ruled paper; (2) the development of the design from an ordinary photographic negative; and (3) the application of the weave units to the several parts of the figure. Primarily, the apparatus consists of an optical lantern with a suitable arrangement of lenses. One important factor is the "raster," or multiplying plate, containing some 435,600 perforations, through each of which the weave type passes, and is printed on the enlarged design. In addition, there are weave plates for determining the details of the pattern, and small metal slides for producing particular sections in distinct forms of type, so that they may be as readily distinguished from each other as if sketched in various colours.

The light from the lantern passes through the negative of the design, entering a pair of lenses, between which is fixed the small metal plate of the proper shape for developing the marks on the sensitised paper. The process consists in dividing and subdividing the "scale" pattern into rectangular spaces, and of marking each with the correct weave type. When there is no negative in the lantern, this type is repeated as many times as there are holes in the perforated plate, showing the feasibility of marking every square photographically on any kind of weaver's paper.

In the first place, the negative is made of the complete design, and

all parts erased but the ground sections, allowing of these being printed with their supplementary weave elements. Negatives of every part of the pattern are similarly printed in succession until the entire design has been obtained. For the production of shaded work, e.g., portraits and pictorial subjects, selecting plates are employed. These secure an accurate graduation of tones perfectly in harmony with the photograph from which they are derived. Provision is made for the execution of patterns in compound as well as in single structure fabrics; but it follows, the more complex the build of the texture, the more intricate the process of design production. Certain textile designs may evidently be produced photographically by the Szczepanik system, so that it is now a question or demonstration whether designs so produced are comparable in elegance and equal for all practical purposes—as forcible in detail, as it is in execution—as those prepared by the much slower hand method.

FOREIGN NEWS AND NOTES.

Metallisation of Wood.—The following method of treating wood to give it the appearance of metal is published by the *Moniteur de la Photographie* as an extract from the *Intérmédiaire de l'art et de l'industrie photographique*. The wood is soaked for three or four days, according to hardness, in a solution of caustic alkali at a temperature of 75 to 90° C. It is then transferred at once to a bath of hydrosulphite of calcium, to which a saturated solution of sulphur in caustic potash is added after a lapse of twenty-four hours. The wood should remain in this bath at a temperature of 35 to 50° C. for about 48 hours. Finally it should be soaked for about thirty to fifty hours in a solution of acetate of lead at a temperature of 35 to 50° C. These successive baths take some time, but the effect is surprising. After the wood has been dried at a moderate temperature, it may be polished with a burnisher of hard wood, and acquires a brilliant metallic lustre, which may be heightened by previously rubbing the surface with a piece of lead, tin, or zinc, and using a glass or porcelain burnisher. The wood then resembles a metallic mirror, and it is very hard and strong.

The Quality of Zinc Plates.—Franz Novak publishes some notes in the *Photographische Correspondenz* concerning the chemical composition of zinc plates from the point of view of their suitability for process work. At the instance of Dr. Eder the writer experimented with a number of samples, which were placed at his disposal by manufacturers of plates for photo-mechanical work. Each sample was found suitable for ordinary zincography and process work by the albumen and cold enamel processes, but with the hot enamel and similar processes considerable difference in behaviour was observable. Some samples became coarsely crystalline and brittle, much to their disadvantage in the subsequent processes of etching and printing, whilst others withstood the burning-in of the fish-glue film very successfully, and were characterised by a very fine grain. Some firms seem to be aware of these peculiarities, and select the plates they sell accordingly. The prevalent opinion that the purest zinc is the best is not borne out by the writer's experiments, and he inclines to the view that the presence of certain impurities is a distinct advantage. The following are the results of two of the writer's analyses:—

	No. 1.	No. 2.
Lead	1·16 per cent.	1·23 per cent.
Cadmium	0·209 "	0·072 "
Iron	0·0298 "	0·0117 "
Arsenic	a trace	a trace
Silver	—	—
Iridium	—	—

Sample No. 1 was found suitable for all classes of work, but sample No. 2 would not give good results with the hot enamel process. It follows from this that zinc containing a larger proportion of cadmium is better suited for hot processes, and that the presence of lead is not so injurious to the quality of a plate as many assert. The writer is continuing his experiments.

Ammonium Persulphate.—Professor Namias points out that this salt may not only be used as a reducer, but also as a means of destroying the action of light upon a dry plate. If a plate be immersed, after exposure, in a two per cent. solution of ammonium persulphate for five minutes, the image will be completely destroyed, and, as the action proceeds gradually, it is possible that this property may be turned to advantage in correcting over exposure.

Also, if an over-exposed carbon print be immersed for half an hour in a five per cent. bath of persulphate, to which one per cent. of sulphuric acid has been added, development will proceed normally in warm water. Professor Namias is of opinion that this is due to the formation of chromic acid by the action of ammonium persulphate upon chromic oxide.

Colour Screens.—The Actien Gesellschaft für Anilin Fabrikation has published directions for the preparation of serviceable colour screens, for lenses not exceeding about eight inch focus. Take a lantern plate with flat even glass; fix it, and after washing it well, immerse it for five minutes in a saturated cold solution of auramin O. To ensure the film being perfectly clean, immerse it afterwards for five minutes in running water. The intensity of the screen may be regulated by more or less washing. Auramin O absorbs blue and violet light.

Reflection from Coloured Surfaces.—The following table of the quantity of light reflected from surfaces of various colours has been published by the *Munich Med. Wochenschrift*. Although the calculation represents the percentage of visual light, whereas in photography the actinic rays exert most effect, the table is, nevertheless, very interesting to photographers.

Black velvet	0·4 per cent.
" cloth	1·2 "
" paper	4·5 "
Dark blue	6·5 "
" green	10·1 "
Bright red	16·2 "
Deep yellow	20·0 "
Pale blue	30·0 "
" yellow	40·0 "
" green	46·5 "
" orange	54·8 "
White	70·0 "
A mirror	92·3 "

Those who are interested in the subject will find that the actinic intensity of the light can best be estimated if the walls are painted pale grey slightly tinged with blue.

COLLODIO-CHLORIDE EMULSION.

UNDoubtedly the manufacture of a collodio-chloride emulsion is a much more difficult operation than is the preparation of a gelatino-chloride, on account of the difference in the solvents, for water, being the most universal solvent, and nearly, if not all, the salts used in emulsion work being soluble in water, it is comparatively easy matter to choose from among the large number of suitable salts, and many variations may be made; but, as alcohol-ether is the solvent in collodion, the choice is very much more limited.

The usual ingredients in a collodio-chloride emulsion are collodion, silver nitrate, an alkaline chloride, and a preservative.

As with gelatino-chloride, the selection of the colloid is a very necessary item in collodio-chloride, and to make it successfully, the pyroxylene must be carefully studied, likewise the specific gravity of the ether and alcohol, or no definite result will be obtained. For making up collodion, ·720 ether and ·820 alcohol should be used, thus ensuring as little water as possible in the emulsion, a very important item to consider, for water tends to destroy the strength of a collodion film. Methylated alcohol can be used for making collodion, provided it is methylated with wood spirit, and not with mineral naphtha. Before using methylated alcohol for collodion, mix the alcohol with water, and if it keeps bright and colourless it may be safely used, but if on the addition of water the alcohol becomes cloudy, it must be rejected. It is rather difficult to obtain alcohol commercially methylated with wood spirit, and that is why absolute alcohol is generally recommended, but in quantities this is quite out of the question on account of the expense. Alcohol methylated with wood spirit can be procured under an Inland Revenue licence, which may be obtained cheaply, and is generally readily granted, providing a guarantee is given that it will be used for manufacturing purposes only. Under this license methylated alcohol of ·820 specific gravity may be obtained, which is a good strength for collodion; a higher specific gravity than this should not be used, on account of the extra water it contains, the aim in a collodio-chloride emulsion being to keep the water down to the lowest possible limit.

Pyroxylene is only supposed to be of two varieties, the high temperature and the low temperature, and while this is true in substance, it is not so in fact, for both high and low temperatures vary considerably. The success of collodio-chloride largely depends upon the pyroxylene

employed, and, unfortunately, the writer has not been able to discover a commercial pyroxyline which is exactly suitable for collodio-chloride without further treatment; but, fortunately, there is a process by which one commercial kind can be made eminently suitable. It is a great pity that low-temperature pyroxyline cannot be used as it is, or a very strong film could be obtained; but once the film of low-temperature pyroxyline dries, no toning will take place, as the silver salts seem to be locked up in the film. High-temperature pyroxyline, on the other hand, gives a film which can be easily worked when dry, as it is very porous, but the disadvantage is that it is rather rotten, and cracks. What is required for collodio-chloride is something midway between the two, combining the porosity of the high temperature with the toughness and strength of the low, and, unfortunately, this is not obtainable commercially. But, if a good and suitable low-temperature pyroxyline is dissolved in ether-alcohol, precipitated by water, dried, and redissolved, a very strong and porous film is obtained. The question is merely one of expense, and at first sight this seems a stumbling-block, but fortunately is not so in reality, for some of the low-temperature pyroxyline is very soluble, twenty to twenty-five grains dissolving in one fluid ounce of ether-alcohol, and even with the latter the alcohol may predominate, also ether of '730 can be used. With the better class low-temperature pyroxyline, a quarter pound may be dissolved in forty-five ounces of '820 alcohol and thirty-five ounces of '730 ether; this, of course, makes a thick, glutinous collodion, but one that is fairly workable. It should be left to thoroughly dissolve, and then either slowly poured into a fairly large body of water, or, better still, into a small wooden trough down which a small stream of water is playing. It is advisable to pour the water and pyroxyline into a canvas bag, as it is rather difficult to collect the pyroxyline otherwise; it should then be squeegeed and drained of as much water as possible, and *thoroughly* dried before dissolving again. The solution is usually of a very pale yellow colour. It is not exactly understood what change takes place in the pyroxyline when it is washed or precipitated, but the hypothesis is that some water enters into combination with it; at any rate, that some chemical change does take place is proved by the absence of contractility after precipitation.

The addition of a small quantity of castor oil and Canada balsam is considered to reduce the contractility of collodion, but the writer advises discretion in the use of Canada balsam, as it has an effect upon the colour of the image.

Commercial collodion, as generally made up of five to six grains per ounce of ether-alcohol, is not much good for collodio-chloride work, and it will be found necessary to use about nine and a half grains of precipitated pyroxyline per ounce of ether-alcohol; and as large quantities of alcohol must be added with the silver chloride and organic preservative, it is advisable to make the collodion as follows at first:

Pyroxyline	95 grains
Ether '720	5 fluid ounces
Alcohol '820	4½ " "

thus allowing half an ounce for the extra alcohol in the salts.

In the choice of a chloride we are limited to about three, viz., calcium, lithium, and strontium; or, perhaps, as Mr. C. J. Leaper advocates in his *First Principles of Photography*, hydrochlorate of cinchonine may be used, although the writer cannot personally recommend this, as he has not found it work very successfully, perhaps owing to some mistake in the hydrochlorate, although it was purchased from one of the best, if not the best, and most reliable firms in the chemical trade; or it may be a printer's error in the formula, the quantity given being excessive. But be the cause what it may, although the writer has had many attempts, with greatly reduced quantities, the alcoholic solution of the hydrochlorate always being perfectly clear and bright on emulsifying, nothing but a heavy white precipitate has been obtained, so that the writer cannot recommend it from personal trial, although, as the nitrate of cinchonine is not deliquescent, and the nitrates of the above-mentioned metals are, a great advantage would be obtained by using cinchonine, for greater immunity from damp would be secured—an important item where paper has to be kept. It is necessary, when choosing a chloride, to study the colour of the image which each gives before deciding. Taking the three aforesaid chlorides, calcium gives a dark blue, lithium a medium red, and strontium a light red print. The writer prefers to use either lithium or strontium, as it is necessary to get a print as red as possible, and for this purpose the best would be strontium; but unfortunately it is not very soluble in alcohol, unless the latter is of a high specific gravity. Alcohol of '820 will only dissolve about one and a half grains per fluid drachm, and if strontium is used, the alcohol in the plain collodion should be still further reduced. Perhaps the most suitable chloride is lithium, the only disadvantage being its much higher price, this being about six times that of strontium.

The preservatives generally used are citric and tartaric acids. The choice of these should be regulated by the chloride used, and before deciding upon the preservative, it is best to mix a small portion of an alcoholic solution of the chloride with an alcoholic solution of citric and then of tartaric acids, leave them to stand for some time, and note what the effect is, for if solutions of lithium chloride and tartaric acid are mixed and allowed to stand for some time, a heavy white precipitate is formed. This may sometimes account for graininess in an emulsion, which must be particularly guarded against, as no satisfactory method of

filtering collodion has yet been found; and, although some writers say that graininess does not matter, or may be overcome to some extent by decanting, "prevention is always better than cure" with this evil, for evil it undoubtedly is.

As alcoholic solutions keep well, and collodion cannot be filtered, it is a great saving of time and trouble to make the acid and chloride up into stock solutions. Citric acid is very soluble in alcohol, and a solution of ten grains per drachm can be made. Tartaric acid and lithium chloride are soluble to the extent of five grains per drachm. These can be filtered before using. It will generally be found necessary to add a small quantity of castor oil to the collodion to make it more flexible, but discretion must be used in adding this, as too much is likely to ooze out, and cause white or red spots and lines upon the prints, for the oil will prevent the toning bath from acting. Five minims of castor oil should be mixed with half a drachm of ether, this being about the right quantity for ten ounces of collodion. The ether and oil should be added to the collodion just before mixing.

Glycerine is also a necessary addition to a collodio-chloride emulsion to keep the collodion film open and workable, and to prevent the silver from crystallising out; but, like castor oil, it must be used cautiously, as too much will keep the paper in a damp state, thus spoiling its keeping properties.

Collodion should always be allowed to stand for about a fortnight after it is made up to allow it to deposit any impurities, which will be found even in the best high-temperature pyroxyline.

It is sometimes suggested that, after a collodio-chloride emulsion is made, it should be precipitated in water and the salts washed away, but the writer is unable to see the necessity of doing so, as the emulsion answers perfectly well without washing; therefore it seems a waste of time, money, and materials to wash it.

Fifteen grains of silver nitrate per ounce of emulsion seem to be about the right quantity to give a good image, and with this about six grains of citric acid per ounce should be used to ensure the emulsion keeping well. If there is an insufficient quantity of citric acid, after a few weeks the paper will show white and yellow spots, either before or after printing. The question of free silver in the emulsion is a debatable point with collodio-chloride, as well as with gelatino-chloride. A certain amount of free silver is perhaps an advantage, but too much is a great disadvantage. The safest plan is to have as little as possible consistent with obtaining a good print.

A very good formula for collodio-chloride is the following:—

Collodion*	9½ fluid ounces.
Recrystallised silver nitrate	150 grains.
Lithium chloride	20 "
Citric acid	60 "
Glycerine	25 minims.
Castor oil	5 "

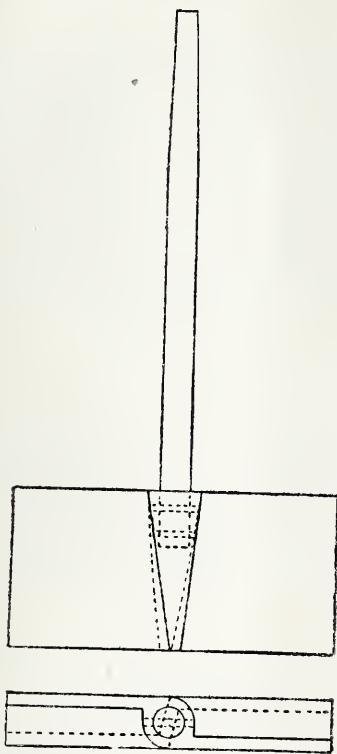
Silver nitrate is very soluble even in cold water, one grain dissolving in one minim of water, and more than this should not be used, as water tends to make the film rotten; the above quantity of silver should be dissolved in two and half drachms of *distilled* water, warmed to about 100° F., and then the glycerine should be dissolved in seven and half drachms of alcohol, this also warmed to about 100° F.—not more, or the alcohol and silver will be discoloured; in any case where methylated alcohol is used it is probable the solution will be slightly discoloured, but not sufficiently so to affect the emulsion. The silver should then be added to the alcohol and glycerine, and it will be found that the mixture of the glycerine with the silver will prevent the latter crystallising out, even in the coldest weather—a rather important point, as should crystallisation occur, most probably the emulsion will be spoilt. On adding the silver to the collodion a slight opalescence will be noticed. The operations up to now may be conducted in daylight, but the emulsification must be done in an orange-yellow light, or, if artificial light is used, it must be either incandescent electric or a Davy safety lamp, as no naked flame must be anywhere near on account of the inflammability of ether; for the same reason no fire is permissible, either in the mixing-room or in an adjoining apartment, as the fumes of ether are very heavy, descend, and are likely to travel through the crevice under the door. The light from incandescent electric or a Davy lamp does not affect the emulsion, and the Davy lamp is perfectly safe even in the densest fumes, for, should they become too strong, the light is extinguished.

If stock solutions of lithium chloride and citric acid have been made up, as before advised, four drachms of the former should now be added to form the emulsion, after which six drachms of the citric acid solution should be added, when the emulsion is ready for coating. To make sure there is no grain, it is advisable to let the emulsion stand for a quarter to half an hour before using, then carefully decant into another vessel, as by that time the larger particles should have settled down.

A glass vessel should always be used for making collodio-chloride emulsion (except in very large quantities) as the operations can be watched more easily.

* This collodion should be made up as before advised, containing five ounces ether and four and a half ounces alcohol. In making collodio-chloride emulsions it is necessary to get the salts into the collodion in as fine a state of division as possible. The silver should always be added first, it being much easier to see that no graininess takes place. The silver nitrate should be recrystallised, as the ordinary kind is usually too acid for emulsion work.

Mixing a collodion emulsion is a much more delicate operation than mixing a gelatine emulsion, as silver nitrate is not really soluble in alcohol, much less ether, consequently the writer recommends the following method of mixing in preference to the usually advocated way of pouring the solutions into the collodion, following this up by shaking and stirring, for by the latter method the solutions are put in very unevenly, and the mixing is very often still more so. A glass funnel should be placed in the ring of a retort stand, a small piece of glass tubing then drawn out to a fine point, and attached to the tube of the funnel by indiarubber tubing, bearing a pinchcock to regulate the flow of the solutions; into the neck of the funnel a small plugget of cotton-wool should be inserted to arrest any impurities in the silver. The cotton can be thrown among the residues afterwards. The solutions should be poured



into the funnel separately and alternately, and allowed to flow into the collodion in a very fine stream. Of course the funnel, &c., must be well washed out after the silver has passed through, or the chloride would be spoiled. After the washing it is as well to run a little alcohol through the funnel and tube to absorb any water which may be left. If a regular stirring is kept up with a glass rod or strip, while the solutions are streaming in, a very fine grained emulsion should result; but a much better way is to use the little implement shown in the accompanying sketch.

The whole of this should be made of mahogany, the stem being fastened into the blade by mahogany pins, as neither glue, nails, screws nor metal pins, must be used, or the emulsion may be spoiled. The end of the stem should be tapered off to fit into a socket, the friction holding it sufficiently tight, as very little power is required. It should be driven at about 150 revolutions per minute, either by hand, treadle, water, air, or electro-motor, and by its aid a very fine mix is obtained with absolute certainty, the solutions travelling right through the collodion. Before using, the whole of the blade and lower part of the stem should be well soaked in alcohol, to decolourise it as much as possible, and directly mixing is finished it should be placed in water, or great difficulty will be found in removing the emulsion. The mixer should be kept in the dark as much as possible, or it will be discoloured. This style of mixer may be used for bromide or chloride, gelatine or collodion emulsions, but a separate mixer should be kept for each class of emulsion.

If the emulsion is properly made, on dipping a glass rod into it, and looking at the light through the bead of emulsion which collects upon the end of the rod, a rich orange colour should be observed.

The emulsion must be used the same day as it is made, for it will not keep, owing to the rapid evaporation of the ether.

Collodio-chloride may be coated fairly well by hand after a little practice, if the edges of the paper are turned up to form a tray; the emulsion should be poured into this, and floated all over the paper, pouring the surplus back into the containing vessel. The great disadvantage about this way is, that it allows the ether to evaporate very rapidly, thus making the emulsion thick, and the coating is then sometimes uneven. As far as the writer's experience goes, he has not found a really reliable and satisfactory way of coating by hand.

In toning collodio-chloride it should be remembered that a bath, strong in gold, gives blue tones, and it is not necessary to use a stronger bath than the following:

Ammonium sulphocyanide	15 grains.
Gold chloride	1 grain.
Distilled water	8 fluid ounces.

The sulphocyanide bath is the best for the above emulsion.

Unlike gelatine, collodion is practically inert so far as silver is concerned, for it does not enter into combination with silver and has no effect whatever upon the colour of the image, and this is probably the reason why collodion prints are the most stable of all photographs made upon printing-out papers, for a definite salt of silver is formed in collodion, instead of the indefinite glosinate and albuminate.

In printing with collodio-chloride, if the negatives are thin, a better result is sometimes obtained by printing the image faintly, in the ordinary way, and then placing the printing frame under green glass to finish the print, when a much more plucky and vigorous image will be obtained. The theory of this is, that chloride of silver is only susceptible to the blue and violet rays, while citrate and tartrate of silver are affected by green and yellow rays as well; thus, when the print is under green glass, the chloride does not change, while the citrate and tartrate do.

The writer has had many attempts to increase the strength and tenacity of high-temperature collodion films by the addition of the following: Gum resins in small quantities, bleached lac, Canada and capaiba balsams, mastic, copal, elemi, sandarac, and dammar; but the result has not been particularly encouraging so far as increase of strength and tenacity is concerned, while (probably owing to their organic nature) they exercise an influence upon the colour of the image. If it is decided to use any of the above, no large quantity should be added, as they are insoluble in, and impervious to, water, and no toning, or only a very little and that of a slow nature, would take place if they were present in any large quantity. The writer has been in the habit of making a saturated solution of each of the gum resins, and adding about six minims of this saturated solution to each ounce of collodion. The saturated solutions of gum resins are very handy in the laboratory as ready-made adhesives, and, as they are all alcoholic solutions, there need be no fear that they will not keep.

All information regarding the conditions under which a license to use methylated spirit for manufacturing purposes is granted may be obtained at the local Inland Revenue Office. A mixture of high and low temperature pyroxylin will sometimes give a good collodion for collodio-chloride work if equal quantities of each are taken, but a small portion should be tried first, as some pyroxylin do not mix well. A reference to the writer's article on the manufacture and properties of pyroxyline, which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY of February 2, 1900, will give a better understanding of the subject, as it is of too lengthy and diverse a nature to be treated here.

If it is found inconvenient to use incandescent electric light, or a Davy lamp, to illuminate the mixing room, or as in many remote districts they are very difficult to obtain, a lamp may be placed outside the window of that apartment, taking care that it is completely isolated from the ether fumes. The one disadvantage of Davy lamps is that only a very feeble light is obtainable from them, but if all the preparations are made in daylight this is not a great drawback. C. T. SUTTON.

HAND COLOURING OF PHOTOGRAPHS.

To many the bare idea of colouring a silver print or photograph by any other process when printed on paper may appear an out-of-date operation, and quite beyond the limits of good taste, in these days of monochrome and matt-surface productions, and but few professional photographers are found giving any countenance to it, beyond the finishing in colour of a certain class of portrait enlargements well known in the trade. There is little doubt, however, that, in many instances, in what may be termed commercial photography, hand colouring is beginning to play a more important part than many would feel inclined to believe, and the sooner professional photographers realise this fact the better will it be for their pockets.

In portraiture monochrome will always reign supreme where merely small sizes are concerned, and it would require something like a revolution to cause a return to the coloured daubs of long ago; but it does not by any means follow that, because hand colouring has ceased to be practised in connexion with portraiture, it should be entirely banished from every other branch of photography, for it is quite true that, in commercial photography, certain subjects will be offered for execution in which much may be done to improve a general effect by the introduction of a reasonable amount of colour work. Any one who carefully studies some of the more recent productions in commercial work, chiefly of the advertising class, will soon see that many of our leading firms, who pay out a large sum annually for advertising purposes, are leaning decidedly to the side of high-class photographs in which a touch more or less of colour is introduced.

Take, for instance, the case of several of our largest steamship companies. It is well known that nearly all of them advertise more or less

by means of expensive "show pictures," sometimes even oil paintings and replicas, and, more frequently still, by means of large direct photographs and enlargements. Each of these large companies has its own distinguishing house flag, or burgee, and, what is of still more importance to them, they invariably make a strong feature of the colouring of their smoke stacks or funnels, and it is now quite a common occurrence for such firms to stipulate that any photographic show pictures supplied to them will require to be coloured, at least to a reasonable extent, not certainly so far as working up elaborately sea and sky effects, but merely so as to show a few of the distinguishing features connected with the company; and this practice, we find, is not confined to this country alone, it is quite common in America as well. Many of our large shipping firms think nothing of giving out an order for two or three dozen high-class photographs as show pictures, the cost of which may vary from two to three guineas each according to dimensions. These costly photographs are in evidence in several of our large hotels, and form striking objects from an advertising point of view, simply by reason of the fact, that they are far removed from the photo-mechanical or colour-printing class of posters commonly seen on hoardings. Many of our railway anterooms are also furnished with show pictures of this class, and they certainly never fail to draw public attention to their beauty as well as a striking feature in advertising. Among the first to realise the value of adding colour to photographic show pictures may be mentioned Mr. David Mac Brayne, whose fine steamer, "Columba," plies on the West Highland route during the summer season. This magnificent steamer is represented by numerous fine coloured photographs of from five to six feet in length, and very striking pictures they make. But what would they be without the introduction of more or less colour? Why, in monochrome they would be unrecognisable. It is not only in such large sizes as these, which, of course, are costly, that colour is being introduced. Several of our large Transatlantic steamship companies are beginning to learn that it looks much better form to advertise judiciously by high-class photographs, in good frames, than to go on expending money in common posters that are washed off by every shower of rain and covered over by designing bill-stickers to make room for a further supply. Hence we see good substantial orders for such serviceable sizes as 15×12 freely given out to such as make a point of expending some amount of care in working up certain effects in colour by means of the hand.

Speaking generally, there is really no great amount of labour entailed in producing these results, and certainly no skill is needed beyond that possessed by any intelligent photographer. The main fact is such class of pictures are in demand, and on the footing "that he who pays the fiddler chooses the tune" photographers would do well to encourage rather than throw cold water on orders where the addition of a little colour work would bring grist to the mill.

In all-round commercial work it will be found that there are many other special instances where colour work can be introduced with advantage. The half-tone block has done much to cut away the feet from many branches in photography, but there are those who are beginning to see that it pays to introduce a little colour, and there are times, when a limited number of copies are merely required, that photo-mechanical productions are out of the question.

For years there has been a dead set made against coloured photographs, and monochrome productions have reigned supreme, until it has come to be believed that colour and photography are quite separate factors. This prejudice, in one sense, may be well grounded where nothing but the highest artistic results are aimed at, but in commercial work there is a vast field in which both can go hand in hand, and, the sooner professional photographers are alive to their interests in this matter, the sooner will they keep in the profession a branch of work which has for years been slipping out of their grasp.

Much may be done to retain this work by judiciously recommending to customers the advantage of coloured photographs as an advertising medium, and in this they certainly can point with confidence to examples where they have been accepted in preference to photo-mechanical productions by leading firms who have not been slow to see what is the best for their interest.

A. T. NEWTON.

Our Editorial Table.

THE THORNTON FILM.

Manufactured and sold by the Thornton Film Company, Limited, Altringham, Cheshire.

READERS of the JOURNAL hardly need reminding that the Thornton film has, within the last few weeks, been brought prominently to the notice of photographers, and that its salient characteristics have been fully described and discussed at the meetings of various societies. Some of the cut film has been in our possession for trial since the beginning of the month, and we have taken more than one opportunity of exposing and developing it. The film is borne upon a translucent paper support. Taken from the original package, it remains perfectly flat, no tendency to curl being observable. Our exposures were made in the Barnett single

slide, the film being backed up with plain pieces of glass. In the developer the film remained quite flat, the translucent nature of the support being all in its favour at this stage of the manipulations, for, when looking at the image by transmitted light, no excessive amount of opacity comes in to lead one astray in the matter of judging density. So far, nothing could be more satisfactory to use than this light, flat, translucent film.

But how, it will be asked, does it behave in the all-important matter of stripping? We reply that, in this respect, its behaviour could not possibly be better. When dry, the paper peels from the gelatine with the greatest ease and readiness. We had no suspicion of failure with the half-dozen quarter-plate films that were sent for our use. An examination of the images shows, as far as can be ascertained, that the support has been without influence upon the negatives, which give perfectly clear prints.

Details relating to the development of the film have already been given, so that their repetition is not called for. It must be said that the simplicity and certainty in manipulation of the Thornton film clearly manifest themselves in actual trial. It is unsafe to make predictions in matters of this kind, but we should be quite prepared to find that the Thornton Film Company had secured a great share of public approval for the film. It appears to be carefully made and is coated with a highly sensitive emulsion which yields dense images of good quality, whilst, besides ordinary development, no extra operations save a glycerine bath and the addition of a "hardener" to the fixing solution are necessitated. Flexible film photography will always command adherents, and the Thornton Company are wise in recognising this fact. We shall watch with interest the progress of the film, especially as regards its keeping properties. At present, both from observation and trial, we can cordially praise it.

MERCK'S CRYSTALLISED PYROCATECHIN.

Manufactured and Sold by E. Merck, 16, Jury-street, E.C.

We have received a sample one ounce bottle of this product, in the form of small white brilliant crystals. Mr. Merck points out that pyrocatechin in heavy crystals is more convenient to handle than the resublimed substance, and that, as the developing properties of both are identically the same, he has decided to supply in future the crystallised article only. It is added that this brand of crystallised pyrocatechin has already been tested on an extensive scale, and has proved fully satisfactory.

LANTERN SLIDES OF ITALY, SPAIN, AND SOUTH AFRICA.

Prepared and published by G. W. Wilson, Limited, 2, St. Swithin-street, Aberdeen.

SEVERAL illustrated lists of Messrs. Wilson's famous lantern slides are before us. Italy alone is illustrated by a thousand transparencies, and Spain by seven hundred. Military subjects are included in one of the lists. Now that the distracting war in Africa is nearing the end, it is to be hoped that the coming winter will witness a revival of interest in optical lantern entertainments, and that Messrs. Wilson's slides will be in greater request than ever.

IMOGEN-SULPHITE.

Agents: A. & M. Zimmerman, St. Mary-at-Hill, E.C.

THE latest developing substance, introduced by the Actien-Gesellschaft für Anilin Fabrikation, is in the form of an impalpable whitish powder. We find it to be a freely soluble product, and when used with sodium carbonate clean in working, and yielding well-graded negatives of a good colour. It appears to be not readily affected by the atmosphere, for we left some of the mixed solution exposed in a graduate for the whole of a night, and found that by the morning it had neither discoloured nor apparently deteriorated. The directions for use as follows:—

Solution A.—A quantity of imogen-sulphite is dissolved in twelve times its equivalent of lukewarm water. This solution is quite permanent, and it is simplest to dissolve the contents of the original bottle in twelve times its quantity of lukewarm water, i.e., twelve ounces of water to each ounce of imogen-sulphite.

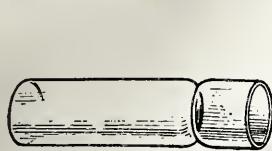
Solution B.—This is a cold saturated solution of soda carbonate (washing soda), which can be prepared by putting a quantity of ordinary household soda into a large bottle and filling up with water. After shaking the water will become saturated with the soda and the superfluous crystals will sink to the bottom of the bottle. The clear part of the solution is to be used for development. Further experiments are needed to assign imogen-sulphite a definite place amongst modern developers, but, so far as we can gauge by our necessarily limited trials, it is a good specimen of the modern clean working reducing agent giving bright and dense negatives.

THE "CARTOL" SYSTEM.

John J. Griffin & Sons, Limited, 20-26, Sardinia-street, Lincoln's Inn-fields, W.C.

THE "Cartol" system of packing accurately weighed quantities of uncomplicated developing powders is one that may be freely commended to tourist photographers and others with whom economy of storage space is matter of importance. From a little pamphlet issued by Messrs. Griffin

we extract the following description of the system, which, by the way, is patented. "A glass tube is divided off into two compartments. The



Plain Cartol Tube.



End of Cartol showing Sealing and Stamping.



Tool for Removing Cork.

smaller section contains the oxidiser, the larger section the accelerator. The divider prevents decomposition between the two. A wafer of cork



Stock Bottles—Old Method.



Cartol—New Method.

closes both ends, which are then hermetically sealed and stamped. With each box of cartols a special corkscrew is supplied, and by its use the tubes may be opened without difficulty." The idea is an excellent one, and it is made the most of in the explanatory pamphlet. Pyro, hydroquinone, amidol, kachin, ortol, metol, and other "cartols" are issued.

CARBONA P.O.P.

Manufactured and sold by J. J. Griffin & Sons, 20-26, Sardinia-street, Lincoln's Inn-fields, W.C.

CARBONA paper is issued in both matt and glossy kinds. Some specimen prints produced upon it have been placed before us, and we are extremely pleased with the rich, warm tones of the images. A mixed borax and acetate bath is recommended, and the following are the formulae:—

FOR WARM TONES.

Acetate soda	50 grains.
Borax	25 "
Water	6 ounces.
Gold chloride	1 grain.
Water	6 ounces.

Take equal parts of the two solutions.

FOR BLACK TONES.

Acetate soda	50 grains.
Borax	25 "
Water	4 ounces.
Gold chloride	1 grain.
Water	4 ounces.

Take equal parts of the two solutions.

Messrs. Griffin state that the advantages of the borax and acetate bath are: (1) No softening effect on the gelatine; (2) economy of gold and greater convenience, the chemicals not being influenced by air or damp.

Carbona is a capital printing paper, and we have had very pleasing prints prepared for us on the sample submitted to us. It is claimed for it that the colour of the image is pigment-like, giving rich browns and deeper blacks, "without the crude purple-blues and chocolates of the orthodox printing-out papers." The claim is well grounded, but the line we have italicised has probably escaped the attention of Messrs. Griffin, who, we are sure, will be the first to admit that the tones of competing printing-out papers (some of which have been on the market for many years) are not necessarily crude.

Studio Gossip.

STEREOGRAPHS OF THE PARIS EXPOSITION.—Messrs. Underwood & Underwood, of 26, Red Lion-square, are issuing a set of sixty original stereoscopic photographs of the Paris Exposition, together with a numbered map and key indicating the route in brief. With the map and the slides before one, a systematic study of the Exhibition by binocular agency is easily obtained. The idea is a most excellent one.

"BIBBY'S QUARTERLY."—The publishers of this beautiful periodical send us a copy of the September issue. The many illustrations, which are engraved half-tones from photographs, are of horses, cattle, sheep, poultry, and the like. The letterpress is exceedingly interesting, and an article on Farming in the Transvaal should command close attention just now. The publishers are Bibby & Sons, Exchange Chambers, Liverpool.

A LONG EXPOSURE.—"A fine-looking young couple came for a Daguerreotype," writes Mr. A. Bogardus in the *St. Louis and Canadian Photographer*. "They wished it in the act of kissing. As I was young and inexperienced (?), I began to wonder how I would pose them; they knew just what they wanted (probably been practising), and assumed the desired position. The sitting required some thirty seconds; they both kept perfectly still and did not

complain of the length of time. The expression was satisfactory. While the male member of the group was attending to the financial part of the transaction, the lady pocketed the picture and they went away smiling. With the instantaneous plate several sittings could have been made in the time required for that one. There may be a difference of opinion among the young folks as to which plate is preferable in such a pose."

THE MAKING OF THE LENS.—Upon the subject of amateur lens-making and altering, "An Old Lens-maker," in *The Photographic Era*, points out that the real value of a lens is its optical truth. Combining the crown and flint of a photographic lens, or, in fact, any achromatic lens (unless the operator thoroughly knows what he is working for) is a very difficult and dangerous task—difficult on account of the task of optically centering the crown and flint, and dangerous because of expansion and contraction of the different metal of which the crown and flint are composed, whilst in the oven for baking. When you make a lens hot for uncementing, the chances are that it will not part, as there is no cement there to melt. That is because the balsam is so completely backed that it has set absolutely. This is especially true in old lenses. Old-time lenses never come apart in baking, but are put, suspended in a bag, in a specially made kettle, and boiled, sometimes for two hours. The necessity for baking was evidently overlooked in the article mentioned. This is really a most important operation. The flint glass is usually a concave meniscus, so that the centre of this portion is extremely thin, and heating such will be attended with danger of cracking. The mistake of warming the lens and putting on cold balsam would cause steam or moisture, which is imprisoned between surfaces, and visible in finished lens. A lens allowed to cool, as the article says, would take a week to set firmly, during which time it would undergo many changes in temperature, and as many chances of decentring. Lenses are usually baked for about five hours in an oven, in cells purposely made to ensure the glasses being optically centered. When nearly hard, they are then pressed central, and in some cases the operation has to be repeated. Some firms have horizontal, and some vertical, spindles, running absolutely true, in which the lenses are placed for cementing, and centered by means of a light. One light is the image, and the other its reflection—or, as the workers call it, "the ghost." There are four lights visible in an ordinary achromatic combination—two images (one from crown and one from flint), and their "ghosts." The way the lights chase each other round is most bewildering to the novice. When the two lenses are optically central, these lights, although the lenses are revolving, appear at perfect rest, and this is an absolute proof of the optical centering of a lens. A good lens not optically centered is worthless, causing aberration, principally chromatic. If people only knew the fine work, care, and brains put into our high-class lenses, they would cease to wonder at the prices.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, September 26, at eight o'clock. "A Few Old Presentation Prints," by Mr. F. A. Bridge.

MR. HENRY EVERETT, the well-known Assistant Clerk to the Limehouse Board of Works, has just been elected a Fellow of the Institute of Secretaries.

THE PATENT OFFICE.—The official *Journal* states that, by the courtesy of the Commissioner of Patents of the United States, copies of drawings (with occasional text) of specifications of United States patents, dating from 1790 to October 12, 1858, have been presented to the Patent Office Library, and are now available for public reference.

CINEMATOGRAPH EVIDENCE.—A Paris correspondent states that the *Vélo*, a paper devoted entirely to automobile news, puts forward a notion which, though highly ingenious, is hardly calculated to please readers. The idea is to effect that policemen should be supplied with cameras working on cinematograph principles, to enable them to regulate the speed of motor cars and force drivers to respect the regulations. It is stated that a manufacturer has already submitted a machine of an extremely simple pattern to the Prefecture of Police. All that the policeman will have to do is to hide behind a tree or kiosque, and at the right moment press a button, when a series of twelve pictures will be instantly taken.

"ARMY LIFE" AT THE ALHAMBRA THEATRE.—By permission of Sir Evelyn Wood, Adjutant-General, and with the assistance of the commanding officers at the various military centres, Mr. Paul has taken a series of animated photographs. A soldier's life is first shown in outline, from recruiting, through the squad drills, Aldershot training, and so on to the finish of his career as a commissioner. The second part of the series shows the work of every branch of the army. Cavalry, Artillery (field and garrison), Army Service Corps, Medical Corps, Infantry, Cyclists', Royal Engineers, are each fully represented by a number of pictures. Mr. Paul went out in a small boat and photographed a running target, while the twelve-pounder shells from a quick-firing battery splashed around the camera.

THE Hackney Photographic Society's Annual Exhibition will be held at the Morley Hall, Triangle, Hackney, on Wednesday, Thursday, and Friday, November 21, 22, and 23, 1900. The Judges will be Messrs. J. Craig Annan, F. Hollyer, and J. C. S. Mummery. Mr. Alexander Mackie will arrange the pictures for hanging. The following are the classes: Members—A, Portraiture, Figure and Animal Studies; B, Architecture; C, Landscape, Seascape, and River Scenery; D, Instantaneous (pictures must represent objects in motion); E, Lantern Slides (sets of four). Open—F, Portraiture and *Genre*; G, Any Picture not included in F; H, Lantern Slides (sets of four); I, Stereoscopic Transparency (sets of four). Entry forms and all particulars may be obtained of the Hon. Secretary Mr. Walter Selfe, 70, Paragon-road, Hackney, N.E.

ELEMENTARY PHOTOGRAPHIC INSTRUCTION.—The course of practical instruction evenings organized by the Borough Polytechnic Photographic Society last winter, by which elementary photographic work was dealt with in a series of simple lectures and demonstrations, will be repeated on similar lines during the forthcoming session. These meetings are held at the Society's rooms,

Borough Polytechnic Institute, 103, Borough-road, S.E., on every Friday evening throughout the season, and are specially arranged for beginners, and those about to take up camera work. There is no specific fee, membership of the Society (5s. per annum) alone being required. The first half of the course will commence on Friday, October 5, at 8.30 p.m. All particulars can be obtained from the Hon. Secretary, Mr. P. C. Cornford, 103, Borough-road, S.E.

THE Cleveland Camera Club's Annual Photographic Exhibition will be held in the Cleveland Hall, Newport-road, Middlesbrough, on Wednesday, Thursday, Friday, and Saturday, November 21, 22, 23, and 24, 1900. The following are the classes:—A, To consist of Pictures that have been previously medalled at other Exhibitions, or hung at the Salon, or Royal Photographic Society's Exhibitions, in London, gold, silver, and bronze medals; B, Landscape and Seascapes, gold, silver, and bronze medals; C, Portraiture and Figure Study, gold, silver, and bronze medals; D, Members' Class (any subject), gold, silver, and bronze medals; E, Lantern Slides (set of six), silver and bronze medals; F, Consisting of Photographic Work not included in the preceding classes, such as Architecture, Still Life, &c., silver and bronze medals. Entries close November 7, 1900. Any further information may be obtained from the Secretary, Mr. Fred. W. Pearson, 98, Victoria-road, Middlesbrough.

We have received the syllabus of the Municipal Technical School and Municipal School of Art, Manchester, for the session 1900-1901. It is a well-printed book of 352 pages, and illustrated by numerous half-tone photographs of the class-rooms. The section of the syllabus relating to photography gives the following information: Lecturer, C. F. Seymour Rothwell, F.C.S. First course, Monday, 7 to 8.15; second course, Monday, 8.15 to 9.30. Fee, 10s. for each course (this includes the special fee of 2s. 6d. for the City and Guilds of London Practical Examination). The first course comprises thirty lectures, and is suitable for those just beginning the study of the subject, either as apprentices or amateurs; whilst the second, or advanced course, also comprising thirty lectures, is intended for those already familiar with the processes described in the first course. The lectures will be illustrated by the most modern apparatus, and each process will be practically demonstrated. Text-book for the first course, J. A. Hodges' *Elementary Photography*. Text-book for the second course, Chapman Jones's *Science and Practice of Photography*. Book of reference, Sir W. de W. Abney's *Instruction in Photography*.

THE syllabus of lectures of the Bradford Photographic Society for the session 1900-1901 has just been circulated, and gives promise of a very busy season. The session opens on October 1 next, with "Hints on Portraiture," by Mr. A. Priestly, Halifax, and the following week the members have an Open Night, which is succeeded in turn by an Exhibition of Members' Slides—a Véloz demonstration, for which Mr. D. A. Nightingale, London, is responsible. Mr. Thomas Heaps, Keighley, will discourse on "Lantern-slide Making," while Mr. Godfrey Bingley, Leeds, is down for "Warwickshire, Gloucestershire, and the Wye Valley," and in turn Mr. Frank Nicholson, with "Bromide Enlarging with Lantern;" Mr. Percy Lund on "Nature Poets and Nature Pictures;" "Carbon Printing, Single and Double Transfer," by Mr. A. Senior, Heckmondwike; "A Cruise in the Solent," by Mr. G. Hudson Taylor, M.A., and one evening is devoted to the Yorkshire Photographic Union's Loan Collection of Lantern Slides. There are two subjects down, viz., Nomination and Question Night, and Ladies' and Children's Night, which do not usually find a place in a club's syllabus, and the General Meeting, on January 21, next year, foretells the close of the year's work. The simple character of the syllabus card gives one no idea of the quality of the lectures, which, it goes without saying, are always excellent at Bradford, and we wish the Club a prosperous session.

AN EXPERIMENT IN COLOUR BLINDNESS.—An experiment or simultaneous contrast was described by Mr. George J. Burch at the recent meeting of the British Association. He said it is well known that white objects seen against a red background look greenish-blue, and orange against a blue background. This phenomenon is shown in a striking manner in the following experiment due to Herin:—A small white disc is viewed with the left eye against a red background, and another similar disc is viewed against a blue background with the right eye. The discs are so placed as to occupy different positions in the field of view. The result, when the light has been properly adjusted, is that the observer sees an amethyst-blue disc and a topaz-yellow disc against a pale purple ground. The reason of this is demonstrated in the following experiment: Two pieces of glass, one red and the other blue, are inserted in a stereoscope in place of the usual slide, each glass having two small squares of black paper on it. Viewed binocularly, the four squares appear as two. In front of the instrument, but out of the direct line of sight, are two adjustable slits, and over the eye-lenses of the stereoscope are two diffraction gratings. The position of the slits is so arranged that the spectrum of the first order of the left-hand grating falls on the right-hand square, and that of the right-hand grating on the left-hand square, the two spectra, which can be adjusted to the same intensity, being thus seen side by side, one with the left eye on a red ground, and the other with the right eye on a blue ground. The red glass produces partial red blindness of the left eye, and the spectrum seen by it lacks red, the other colours being unaltered. And for a similar reason the spectrum seen by the right eye lacks blue, the effect being more noticeable owing to the contrast of sensation in the two eyes.

Commercial Intelligence

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Master H. G. Palmer, 18, King's-gardens, Hove, Sussex, for his negative, *Arundel Castle Grounds*.

THE recent Congress of British Chambers of Commerce at Paris, adopted resolutions urging the adoption of the metric system of weights and measures in our Government departments, and the teaching of decimals in public elementary schools at an early stage, as an essential part of arithmetic.

THE RATHENOW OPTICAL WORKS.—We have received from Mr. H. F. Purser, of 33, Hatton-garden, E.C., a little book which was recently issued to commemorate the centenary of the foundation of the firm of Emil Busch, and with it the optical industry in Rathenow. Mr. Purser informs us that on Saturday fortnight the whole of the town was taking part in a festival in celebration of the event, and the programme consisted of congratulatory meetings, and included the unveiling of the monuments of John Duncker and Emil Busch.

THE Directors of Kodak, Limited, have passed the following resolutions:—"That an interim dividend at the rate of six per cent. per annum for the quarter ending September 30, 1900, be declared on the preference issue; that an interim dividend of two and a half per cent., less tax, be declared on the ordinary shares in respect of the quarter ending September 30, 1900, and that, in view of the satisfactory increase in the net profits for the half-year ending June 30, 1900, a further dividend of two and a half per cent. be distributed on account of bonus for the year; that the above-mentioned dividends be payable on or after the 30th inst.; and that the transfer books be closed from the 15th to the 30th inst., both days inclusive."

Re WILLIAM HENRY BARBER, photographer, of Matlock Cliff.—This debtor, in the course of his public examination at the Derby Bankruptcy Court before Mr. Registrar Woodforde, stated that his liabilities amounted to 135*l.*, and his deficiency to 122*l.* His failure had been caused through bad debts, heavy expenses, and pressure by creditors. He took over a photographer's business at Matlock in 1895, and borrowed 90*l.*, which he used in the business. The security he gave was a reversionary interest under the will of his grandfather. In September 1897 he entered into partnership with a Mr. Smith, who put 150*l.* into the business. Afterwards the partnership was dissolved. Mr. Smith did not get his money back, nor any part of it, so he brought an action against the debtor, which fell through. His profit from the business had amounted to about 150*l.*

THE WARWICK COMPETITIONS.—The following is the list of awards of the Warwick Competition for the current month:—10*l.* prize, A. E. Lane, Photographer, McLucas Studios, Lilanelly, *A Portrait*; 5*l.* prize, J. Fitzgibbon-Forde, Waterloo-place, Sunderland, *Jack*; 1*l.* prizes, H. Addenbrooke, Stratford-road, Birmingham, *An Old Church Porch*; J. P. Beeson, Southwell, Nottingham, *Capital, Southwell Chapter House*; E. R. Bull, Bovill-road, Forest Hill, S.E., *In a Baronial Hall*; W. J. Channon, Oberstein-road, New Wandsworth, S.W., *Lady Diving, Portrush*; H. B. Cookson, Kingswinford, Dudley, *Sweet Peas*; P. R. Drury, Newport-road, Cardiff, *A Group of Fox-hounds in Kennels*; Miss Lillie Eager, Trafalgar-place, New Cut, Bristol, *Paddling*; S. G. Frith, Grange-road, Mt. Roskill, Auckland, N.Z., *The Scissor Grinder*; H. J. Godbold, White Rock-place, Hastings, *Fishermen's Welcome to Lord Brassey*; G. V. Grundy, Steven-street, Stretford, *On the Silvery Wharfe*; Mrs. R. M. King, Ashcott Hill, Bridgwater, *A Lilac Sunbonnet*; D. Noakes, Central Hotel, Eastbourne, *Children in a Bath*; W. Norrie, Photographer, Cross-street, Fraserburgh, *A Reaper of the Sea*; H. Phoenix, Photographer, Chapeltown, Sheffield, *Full-length Portrait*; H. Price, Dennis Vale, Stourbridge, *A Country Lane*; J. T. Roberts, Hadlow-place, Upper Norwood, S.E., *Tintern Abbey*; Miss Alice Rogers, Southdown-avenue, Brighton, *Snap-shot, Brighton Pier*; P. F. Weeks, 13, High-street, Ramsgate, *Mercery Lane, Canterbury*; J. Wild, Sandon-street, Darwen, Lancashire, *View near Houghton*; F. G. Young, Alexandra-road, Penzance, *A Newlyn Fisherman*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
25....	Birmingham Photo. Society ...	Negative Developing Competition.
25.....	Hackney	{ Birch and Bracken: How to Treat it. W. Thomas.
26.....	Photographic Club	{ A Few Old Presentation Prints. F. A. Bridge.
27.....	London and Provincial	Open Night
28.....	Croydon Microscopical	Conversational Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 13.—Mr. R. P. Drage in the chair.

Mr. A. L. HENDERSON, in showing a transparency on opal, said that he thought it was a pity that glass-makers did not flash opal glass exceedingly thin. The transparency passed round would be much better if the opal were thinner. Opal was much to be preferred to ground glass, but, unfortunately, whether pot-metal or flashed, the former was always too thick, and absorbed too much light.

Mr. W. T. WILKINSON replied that flashed opal glass was difficult to cut. If cut on the plain glass side, the cut often failed to carry through the flash.

COLLOTYPE PRINTING.

Mr. W. T. WILKINSON gave a lecture on the collotype process for the amateur or non-commercial man, and demonstrated the pulling of the prints from plates of several sizes. When the collotype process was mentioned, he said, it often suggested to the uninitiated expensive plant, and visions of many difficulties. It was to disprove this idea that he had come to-night, and he hoped to show that the process was one capable of being worked in a very simple and inexpensive manner. The press he proposed to use was an ordinary American wringer, that could be easily clamped to a work-table; but, although this was, so to speak, an improvised or make-shift press, the specimens he knew would show that such a simple apparatus was quite capable of giving good results. In the usual way, the collotype plate is prepared on patent plate glass of a quarter of an inch thickness. For the amateur work with the press shown, to which he was specially drawing attention, this glass was not necessary; he used the twenty-one ounce glass, and passed round a piece for

spection. First of all, a collotype-worker wanted an oven. The collotype plate must be dried—not baked, and the model of an oven suitable for the purpose was passed round. A paraffin lamp may be placed under the sheet-bottom for heating purposes, but better than this is an atmospheric stove, placed about six inches from the bottom. For reasons to be indicated later, one must have two plates at least at a time. Having obtained the twenty-one ounce glass, which must be ground on one side, and can be bought so for 3d. 4d. per foot, we proceed to sprinkle it with flour emery. Dealers have a very elastic notion of what constitutes flour emery, so, to be safe, it is better procure some of Oakey's knife polish. With this, wetted, the plate of glass is reground until the surface is as even as it can be made, after which it is well washed. A substratum is then required for the plate. Usually this consists of beer and silicate of soda; the use of beer, however, having been known to provoke sarcastic remarks, it may be stated that a good substratum is made of an ounce of dextrine to ten ounces of water, mixed with an ounce of silicate of soda. Silicate of soda, again, was a very vague term. That bought of some dealers is not ready for use for a month sometimes, but, if of the consistency of sugar, it will do very well. The mixture is filtered and applied to the plates, which must then be dried by heat. Directly the plate is dry, it is rinsed under the tap for a minute or two, and placed on end to dry spontaneously. Such a plate will keep any length of time. The substratum is to hold down, during subsequent processes, the sensitive coating yet to be applied. While this is being made ready, the plate is put in the oven, carefully levelled, and slowly heated to about 50° C. The sensitive mixture is prepared in the following way: Two ounces of a good gelatine, the harder the better, is soaked in ten ounces of water until soft, and then dissolved over a gas-stove. He found a gelatine at 3s. 6d. per pound, sold by Klinsch, was excellent for the purpose. Half an ounce of powdered bichromate of potash is then added. Some workers recommend bichromate of ammonia, but potash was best, he thought. The mixture is filtered through swansdown, and is then ready for coating. Plates must have a definite quantity of solution for the best results. One of 3x10 should have about six drachms. Plates of different thicknesses were used. After coating, the plates are returned to the oven, quite level, and allowed to dry at a temperature of about 100° F., this operation taking about an hour. The gas is turned out and the two plates allowed to cool, after which one is turned over on to the other. This explains the necessity for two plates. It is one of the secrets to success. If left exposed in the oven, they could eventually be found to ink up with dirty whites, but the mere fact of leaving them face to face preserves them for as long as a fortnight. For printing, reversed negatives are required or a film negative. If clean margins to the prints are wanted, a mask of tinfoil is placed on the negative. An exposure meter is necessary, and a very good one is Wynne's print meter. When printed deeply enough, the plate is plunged into cold water without cause whatever. Much depended upon this, and no delay should be allowed. When wet, one may do as one likes, but not before. After the bichromate is removed, the plate is once more dried, and is then ready for the so-called "etching" solution—a misnomer. The action of this solution is really to etch the parts not influenced by light. It is prepared by mixing equal parts of glycerine and water with a little ammonia. When sufficiently swelled, the glycerine is dabbed off with a sponge, and ink applied by means of a glue roller. The ink must be of good quality, and should be diluted to working consistency with varnish. A piece of paper is next laid on the plate and the two passed through the press, when a print will be produced more or less perfect as the operations have been properly or improperly performed. Mr. Wilkinson printed a number of copies from various plates, and afterwards answered a number of questions concerning working details.

The lecture was heard with attention, and was much appreciated.

Croydon Camera Club.—Saturday, September 15, was a red-letter day in the history of the Croydon Camera Club. An excursion, arranged and conducted by Mr. Ben Edwards, turned out a record; no less than fifty-four members and friends (ladies and gentlemen) made up the party. Taking train to Hampton Court, where a steam launch was waiting, a run up the river to Chertsey, in glorious weather, was much enjoyed, where a good tea was well served on nicely decorated tables at Taylor's tea gardens, after which Mr. Ben Edwards read a letter from the President (Mr. Hector Maclean) regretting his inability to join the party. Mr. EDWARDS mentioned that it would, perhaps, interest those present to hear that the excursion was the outcome of a challenge to organize a successful social outing. In the absence of the President, he called upon the Vice-Chairman (Mr. S. H. Wratten) to welcome the visitors, which he did in a few well-chosen words. Mr. W. E. DUNMORE replied on their behalf in his well-known style, remarking that he thought the excursion was from Thornton Heath, as there seemed to be a good many from that little village, which, he regretted, he had not heard of before, and would like to know on what part of the globe it was situated. Those enthusiastic photographers who had brought cameras found their time so much taken up with enjoying themselves otherwise that they had little opportunity to use them. The official group was, however, taken by the Hon. Secretary (Mr. W. H. Rogers), and will be duly labelled, "The Croydon Camera Club, First Annual Social Excursion." The trip back was enlivened by music and songs, and train home concluded a very successful and enjoyable outing.

FORTHCOMING EXHIBITIONS.

1900.

- Sept. 21–Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- October 1–Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- , 17–20 Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.

- November 7–10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
- , 12–17 Ashton-under-Lyne.
- , 21–23 Hackney Photographic Society.
- , 22–24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove. 1901.

- January 14–19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

- THE following applications for Patents were made between September 3 and September 10, 1900:—
- FILMS.—No. 15,614. "Improvements in or relating to Photographic Films." J. E. THORNTON.
 - PHOTOGRAPHS.—No. 15,615. "Improvements in Photographic Pictures and in the Materials or Mounts therefor." J. E. THORNTON and C. F. S. ROTHWELL.
 - SENSITIVE PAPERS.—No. 15,616. "Improvements in Photographic Sensitised Papers and the like." J. E. THORNTON and C. F. S. ROTHWELL.
 - FILMS.—No. 15,617. "Improvements in Films and the Manufacture thereof." J. E. THORNTON and C. F. S. ROTHWELL.
 - HAND CAMERAS.—No. 15,640. "Improvements in Hand Cameras." THE THORNTON-PICKARD MANUFACTURING COMPANY, LTD., G. A. PICKARD, and C. G. WOODHEAD.
 - PHOTOGRAPHING COLOURS.—No. 15,647. "Improvements in Apparatus for Photographing Colours." Communicated by L. E. Dugardin. H. J. HADDAN.
 - CAMERAS.—No. 15,722. "Improvements in Photographic Cameras." E. D. BARTLETT.
 - DEVELOPING TRAY.—No. 15,775. "The R.E.F. Daylight Developing Tray." R. E. FRASER.
 - CAMERA REST.—No. 15,898. "An Improved Form of Rest or Support for Photographic Cameras." W. R. BRUNTON.
 - CAMERAS.—No. 15,926. "Improvements in Photographic Apparatus or Cameras." C. HOWELL.
 - DISHES AND TRAYS.—No. 15,999. "Improvements in Dishes or Trays for Use in Treating Photographic Plates and the like." Communicated by the Bayerische Celluloidwaarenfabrik vormals Albert Wacker A. G., Germany. W. P. THOMPSON.

Correspondence.

- * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
- * * We do not undertake responsibility for the opinions expressed by our correspondents.

STEREOSCOPIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN.—When examining a properly mounted stereoscopic print by crossing the axes of the eyes, so as to see the picture in relief, the latter is pseudoscopic. Now, take a negative: look at it through the glass, at the film, upside down—in fact, in any way it is possible to look at it—and the effect is always stereoscopically correct. This in spite of the fact that, when looking at the film (*i.e.*, film next the face) with the eyes crossed (the negative being upside down), the right eye is looking at the left-hand negative; and the same when looking through the glass with negative right way up. That is, no matter how you look at the negative, the effect is always stereoscopic. I don't know enough of optics to account for this.—I am, yours, &c.,
Pachmarhi, C.P., East India, August 26, 1900.

H. HANDS.

[We possess considerable power of converging or diverging the optic axes, and therefore can see widely mounted binocular prints stereoscopically, but we cannot cross the axes and therefore cannot see a properly mounted print pseudoscopically. But we can quite confirm, from actual experiment, what our correspondent says of the omnistereoscopic properties of a negative. Brewster in *The Stereoscope*, chapter xvi, p. 216, makes a reference to the subject which may help to explain a curious phenomenon: He refers to a "remarkable fallacy of sight which takes place in the stereoscope when we interchange the binocular pictures, that is, when we place the right-eye picture on the left side, and the left-eye picture on the right side. The objects in the foreground of the picture are thus thrown into the

background, and, *vice versa*, the same effect, as we have seen, takes place when we unite the binocular pictures, in their usual position, by the ocular stereoscope, that is, by converging the optic axes to a point between the eye and the pictures. In both these cases the objects are only the plane representations of solid bodies, and the change which is produced by their union is not in their form, but in their position. In certain cases, however, when the object is of some magnitude in the picture, the form is also changed in consequence of the inverse position of its parts; that is, the drawings of objects that are naturally convex will appear concave, and those which are naturally concave will appear convex. In these phenomena there is no mental illusion in their production. The two similar points in each picture, if they are nearer to one another than other two similar points, must, in conformity with the laws of vision, appear nearer the eye when combined in the common stereoscope. When this change of place and form does not appear, as in the case of the human figure, previously explained, it is by a mental illusion that the law of vision is controlled."—EDS.]

EXPRESSION IN PORTRAITURE.

To the Editors.

GENTLEMEN,—Will you kindly inform me if article by E. K. Hough, mentioned in your leader on "Expression," is procurable, and where?—I am, yours, &c.,

E. H. DEBENHAM.

To the Editors.

GENTLEMEN,—On page 563 of your JOURNAL you refer to the writings of "E. K. Hough." Will you kindly inform me who publishes his work on Posing and Lighting to which you refer?—I am, yours, &c.,

LIGHTING & POSING.

To the Editors.

GENTLEMEN,—I should be glad to know in what form the examples from the pen of E. K. Hough are published, and also who are the publishers? You mention the work in a recent JOURNAL under the heading of "Expression in Portraiture."—I am, yours, &c.,

H. P.

September 7, 1900.

To the Editors.

GENTLEMEN,—I should be obliged if you could advise me of the title, and, if possible, publisher, of the book by E. K. Hough, mentioned in your article on "Expression in Portraiture." Your eminently practical articles are much appreciated. Many thanks.—I am, yours, &c.,

JOHN G. WILLIAMS.

Bridge-road Studio, East Molesey, September 8, 1900.

[We append an extract from the article by E. K. Hough, which appears in Wilson's *Photographics*. The volume could doubtless be had from Mr. Edward L. Wilson, 289, Fourth-avenue, New York.—EDS.]

"We will suppose the sitter to be the centre of a circle with diverging lines, like the hub of a wheel with its radiating spokes. Suppose this wheel twenty feet in diameter, and the spokes one foot apart at the periphery. The junction of these spokes with the rim we will call points, like a compass.

"Place the sitter at the hub, looking straight before him, body, face, and eyes to the camera, ten feet away, at the outer edge of the circle.

"This may be called a position of neutrality, impassive, inactive. Now, the body remaining in front, the head and eyes turning to the left or right, *if ever so little*, there begins to be expressed activity, thought, emotion, in which the eyes play an important part, and a part that may be largely brought under control, else there were no use describing it.

"To illustrate: If the head be turned two points away from the camera, the body remaining front, the eyes, to express an easy, animated, but not deeply interested attention, should be turned nearly to third point.

"When the head turns from the body to the fourth point, the eyes, to correspond, should turn nearly to the sixth, thus expressing the same kind of easy, natural interest, but more active and more interested, and this corresponding divergence amounts nearly to a definite ratio, whether the turning be more or less, being as two to one, two of the head from the body to one of the eyes from the face; or, in other words, in turning the eyes to an easy point right or left, the head naturally turns about two-thirds the distance.

"This ratio of divergence we will call normal, and we shall find it giving about the kind of expression generally preferred in portraiture.

"Moreover, we shall see that any deviation from this normal relation immediately begins to express something different, often something not at all desired. For instance, the body remaining front, with the face and eyes *both* turned full upon the third or sixth, or any intermediate point, there would immediately begin to appear an absorbed, deeply interested gaze, expressing anxiety, surprise, or other emotion, according to the rest of the face and action; while, should the face remain fronting, with the body directly towards the camera, when the eyes turned two or three points away, there would immediately appear an uneasy, insincere, jealous, watching expression, not at all pleasant.

"Varying the illustration by placing the body fronting the third point away from the instrument, while the face turned to the first point away, and the eyes into the camera, you will have an easy, direct, sincere, manly attention; while, if you place head and body both fronting point three, when the eyes are turned full upon the camera, you obtain at once shyness, coquetry, suspicion, or other similar expression, according to the other facial action. Then, if you front the body upon three, while face and eyes *both* turn full upon

the camera, there would begin to appear a bold, domineering, look-you-out-of-countenance sort of expression, or other similar undesirable effect.

"The same principle holds good in looking upwards, for instance; the head slightly raised, with the eyes about half as much more, may express spiritual contemplation, adoration, supplication, &c., according to the accompaniments, while the face, remaining level or slightly drooped, with the eyes still turned upward, looking as they must somewhat from under the eyebrows, will express a cowardly shrinking, a sinister watching, or suppressed anger, according to the other features.

"These hints might be greatly elaborated, but the intelligent beginner will place his camera before the sitter and multiply these illustrations to any extent. The main thing to thoroughly understand is that, in every modification and turn of position, these relations of the eyes and face *will express something*, and, if not controlled to express what is desired, may give expressions quite undesirable."

A CORRECTION.

To the Editors.

GENTLEMEN,—*Re* your notice of our patent, No. 15,693, in your issue of September 7, will you kindly correct the title of same, which, according to the specification lodged at the Patent Office, should be, "An Improved Support for Focussing Cloths and Screens for Photographic and other Lenses."

From the heading in your paper it is difficult to know the purpose the invention is for, whereas, described by the above title, together with the description and illustration you kindly gave, it would have been better understood.

My name as inventor should also be Belbin, not Bilbin, as printed. Thanking you in anticipation, I am, yours, &c., CHAS. T. BELBIN,
75, Abbey Foregate, Shrewsbury.

[We shall be pleased to examine one of the supports if our correspondent will send it for that purpose.—EDS.]

A SOCIETY FOR PHOTOGRAPHIC ASSISTANTS.

To the Editors.

GENTLEMEN,—Would you kindly inform me of the name and address of the society or union your paper has been advising photographic assistants to join? I think you named it Clerks' and Shop Assistants' Union. I have been informed that a branch has been opened in Glasgow. On making inquiries, however, the Post Office people don't seem to know anything about it, and almost suggest that it cannot be quite respectable when they haven't got their address registered with them. The City Directory shows no trace of them either. I have become quite chary about the whole thing. Please say what inducements do they offer, &c., in sickness or out of employment. I would like your candid opinion on this affair. I mean as to stability and respectability, &c., and you might say what their Glasgow address is.—I am, yours, &c.,
Glasgow.

ALEX. CAMERON.

[There exists, we believe, a National Union of Shop Assistants in London, but our correspondent is in error in supposing that we have recommended photographic *employés* to join it. We know nothing of the Union. It is a regrettable thing that photographic operators do not, will not, or cannot combine for purposes of mutual help and support. Until this unfortunate state of affairs is remedied, the advantage to the isolated unit of joining unrepresentative organizations is difficult to perceive.—EDS.]

PHOTOGRAPHY IN PARIS.

To the Editors.

GENTLEMEN,—Bravo, "Cosmos!" It is always a pleasure to find one who knows and has the courage to express his opinion freely and frankly. Every one, except perhaps one or two photographic operators, knows that there is nothing to learn in France, especially in Paris (formerly Lutèce or Lutetia), and, as far as taste goes, it is far behind all countries, and for that article one must go to England, and not even choose London, but any small city will do. It is now to be understood why England made such a poor show at the Exhibition. England did not want France to copy their good taste, &c., without coming over to that country, where it is to be seen anywhere, free of charge, of course. Yes, "Cosmos," you are right in your saying, and you could have even added to your advice, Gentlemen, stay at home. You can find plenty of studios where work is offered, and chances to improve immensely at very reasonable terms.

Reading carefully over THE BRITISH JOURNAL OF PHOTOGRAPHY and the different letters written by successful English operators, this "reasonable terms" may have double meaning. The artistic studio man will accept small remuneration to allow a pupil or apprentice to learn his trade to his full satisfaction, or he will allow reasonably poor terms to his operator to work for him, and he can learn tasteful posing and other things to his heart's content. Stay at home, "operators," and study the columns of Situations Vacant in your photographic journals. Now, my dear Mr. Cosmos, the situation may be exactly the same everywhere, but, when living in glass houses, do not throw stones. When it comes to art and taste, France has a little something to say, and there are not only

street-sweepers that go into photography, but a few noblemen, whose names could fill a few numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY, ut I do not think this is a proof that photography is less admired here than anywhere else, nor the photographer less of a gentleman.—I am, yours, &c.,

Asnières, Seine, September 14, 1900.

THE STUDY OF PHOTOGRAPHY FOR BUSINESS PURPOSES.

To the Editors.

GENTLEMEN,—I am desirous of obtaining a thorough knowledge of photography to enable me to obtain a situation. I have had no previous experience, but I have a good knowledge of drawing and painting in both oil and water colour, and I am told that I possess good artistic taste. Will you be good enough to tell me the usual way to obtain a beginning?—I am, yours, &c.,

EVELYN.

[Our correspondent, a lady, does not say the kind of situation she is anxious to obtain, but we presume she wishes to turn her talents to account in a portrait studio. In the sense implied there is no "usual way" of obtaining a beginning. Perhaps "Evelyn's" best plan will be to go through a course of study at the Polytechnic institution, 309, Regent-street, and then endeavour to obtain a situation at a photographer's as improver.—EDS.]

BRITISH VERSUS GERMAN PRINTING.

To the Editors.

GENTLEMEN,—Could you inform me what firm or firms in England and Germany would do me about 20,000 pictorial post-cards from my own negatives? I would prefer to give it to an English firm, but I must compete with others, so must go where I can get good work cheapest.—I am, yours, &c.,

F. FRY.

[We presume our correspondent requires collotype prints. If so, Messrs. Morgan & Kidd, Richmond; The London Stereoscopic Company, Cheapside, and other firms who advertise in this JOURNAL and its ALMANAC, execute such work in enormous quantities, and should be able to quote lowest prices consistent with good printing. With regard to German firms, we can give no information, but we conceive it a duty to use every legitimate endeavour to prevent work being sent out of this country.—EDS.]

NEWNES' LANTERN LECTURES.

To the Editors.

GENTLEMEN,—You have been courteous enough in previous years to allow us the use of your columns for the purpose of announcing the several lantern lectures which we are willing to loan to the several institutions, literary societies, working men's clubs, and kindred institutions.

This year we are able to offer your readers several new and interesting lectures in addition to those issued.

These latter, we may say, have been thoroughly revised and brought up to date.

For the direction of those who are not acquainted with the conditions of loan of these slides, we may briefly state that we require the carriage only to be paid to and from these offices, and certain easy rules observed.

The names of the new lectures are as follows:—

1. "A Day and Night in Newspaper-land."
2. "England's Beautiful Homes."
3. "Gems of Religious Art."
4. "Popular Artists and their Work."
5. "Famous Authors and How They Write Their Books."
6. "Some Popular Hymn Writers."

We shall be pleased to send full syllabus and conditions to any of your readers who will forward a stamped addressed envelope to these offices. Letters to be marked "Lantern Lecture."—We are, yours, &c.,

GEORGE NEWNES, LIMITED.

Lantern Lecture Department, 7-12, Southampton-street, Strand.

We append Messrs. Newnes' conditions for the loan of the slides and lectures:—

1. The full date for which the slides are wanted, with particulars of organization under whose auspices one or other of the above lectures is to be delivered, must be stated at the time of application.

2. Slides required for the country are sent the day previous (or, if possible, earlier) to that on which they are to be used, and must be returned by first train the morning after being used.

3. Carriage must be paid both ways by the borrower, and the slides returned prepaid, per passenger train, marked "George Newnes, Limited, 7-12, Southampton-street, Street, London, W.C." No remittances need be sent to cover the amount of carriage, as the slides will be sent to the borrower carriage forward.

4. During the period the slides, &c., are in the possession of the borrower, he will be held responsible for any breakages. Should any breakages occur, a charge of one shilling for each slide broken will be made.

5. All applications, letters, &c., requiring a reply must be accompanied by a stamped addressed envelope.

6. Each lecture will contain a list of the slides sent. The lectures occupy about an hour and a half to deliver, and, should the lecturer desire to curtail the time, the lectures are so prepared as to enable this to be done with facility.

THE THORNTON-PICKARD COMPETITIONS.

To the Editors.

GENTLEMEN,—We shall be glad if you will again kindly call the attention of your readers to our Photographic Prize Competition, and remind them that the same closes on October 1. We should be glad if all intending competitors would kindly send in their entries as soon as possible.—We are, yours, &c.,

THE THORNTON-PICKARD MANUFACTURING CO., LIMITED.

Altringham, September 15, 1900.

[We published full particulars of these competitions earlier in the year, but, for the information of those who have not yet entered, we append a list of the prizes:—

Class I.—For sets of photographs taken with the Thornton-Pickard "Amber" or "Ruby" camera and "Time and Instantaneous" shutter. First prize, 15*l.*; second prize, 10*l.*; third prize, 5*l.*; fourth prize, 3*l.*; fifth prize, 2*l.*

Class II.—For sets of photographs taken with the Thornton-Pickard focal-plane shutter, fitted to any make of camera. First prize, 15*l.*; second prize, 10*l.*; third prize, 5*l.*; fourth prize, 3*l.*; fifth prize, 2*l.*

Class III.—For sets of photographs taken with any of the Thornton-Pickard various patterns of "Time and Instantaneous" or "Snap-shot" shutters, fitted to any make of camera. First prize, 15*l.*; second prize, 10*l.*; third prize, 5*l.*; fourth prize, 3*l.*; fifth prize, 2*l.*

The Thornton-Pickard Company will supply entry forms on application.—EDS.]

THE SALE OF POISONS.

To the Editors.

GENTLEMEN,—Referring to the correspondence which has recently appeared in the columns of your valuable JOURNAL, I think it right, with your permission, to call further attention to the work this Society is doing for all classes of traders and users of poisons and poisonous compounds for trade and technical purposes. A Bill has been drawn and settled by counsel for early presentation to the Legislature. This Bill proposes to amend the law as it now exists with regard to the sale of poisons and compounds thereof so largely used in agriculture, horticulture, and photography. It should be clearly understood that the proposed Bill only deals with such poisons or compounds thereof as are used for trade or technical purposes; it is not intended in any way to invade the chemist's or druggist's province, which is the retailing and compounding of medicines that may or may not contain poisons.

Petitions in favour of this Bill are now lying in all the chief cities and towns of the United Kingdom and are being largely signed.

The Chemical Section of the London Chamber of Commerce has taken up the matter, and a second meeting is shortly to be held to specially consider and discuss the provisions of the Bill.

My Committee at the earliest fitting opportunity propose to approach the Privy Council on the whole matter. We are seeking support from all persons interested in seeing the present anomalous condition of the law altered, and, in order to make the movement a popular one, the annual subscription of members has been fixed at five shillings.

I shall be glad to afford your readers any further information in my power.—I am, yours, &c.,

T. G. DOBBS.

5, Clement's-inn, Strand, London, W.C., September 17, 1900.

[Mr. Dobbs encloses us a leaflet fully descriptive of the aims and objects of the Traders in Poisons and Poisonous Compounds for Technical and Trade Purposes Protection Society.—EDS.]

TONING P.O.P. WITHOUT WASHING.

To the Editors.

GENTLEMEN,—Under the above heading in last week's JOURNAL, replying to "Nemo," you write, "We think it would be preferable to wash out the free silver and acid before the prints are put into the toning bath." May I venture to defend the practice of your correspondent by the result of my own experience? For the last two years I have invariably followed the "dry treatment," which was, I think, introduced by Mr. Welford, and with perfectly satisfactory results. It saves the time and trouble of preliminary washings, and, if due care be taken to see that the prints are covered at once with the solution, and that there are no air bubbles, it is a perfect preventive of double tones. Of course, a little more gold is needed, but this to an amateur, who will only require one or two prints from a negative, is a matter of slight importance. There may be objections to the practice indicated of which I am ignorant—perhaps on the score of permanence; but, as posterity is not likely to be acquainted with my work, or to mourn over its fading beauty, it does not trouble me. To those who, like myself, only photograph for the present pleasure which it brings, I strongly recommend toning without previous washing.—I am, yours, &c.,

F. H. C.

[The method certainly saves a little trouble, but it consumes more

gold, which is not all deposited on the prints, but wasted. This correspondent says he does not attach any importance to the ultimate permanence of his work, but that is not the case with the majority of photographers. They wish their work to last for more than a couple of years, and also desire to economise their gold, especially where large numbers of prints are turned out daily.—EDS.]

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London W.C. Inattention to this ensures delay.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

LANTERN SCREENS.—Z. asks for the address of the makers of the Crystal Palace Lantern Screens.—In reply: We believe they are made by Messrs. George Gill & Sons, Warwick-lane, E.C.

H. F. M. (Liverpool).—We regret that we must leave your query unanswered. It is a rule of ours not to recommend one make of camera in preference to another, and from that rule we never in any circumstances depart.

FADING.—ERNEST. We should say that the mounts have nothing to do with the fading, but, of course, we could not say for certain without submitting them to tests. We should be rather inclined to say that the fading is due to imperfect fixing. See article on another page.

BOOK FOR A BEGINNER.—INFORMATION asks: "What is considered the best guide-book for beginners in amateur photography?" — In reply: Beginners' books are very plentiful. As good as any is Mr. Ethelbert Henry's *Early Work in Photography*, published by Dawbarn & Ward, Farringdon-avenue, E.C.

COPPER TONING.—E. G. writes: "Will you kindly inform me in what number is given the formula for toning sepia bromides with copper?" — In reply: We presume our correspondent refers to the toning process of Mr. W. B. Ferguson, Q.C. Let him refer to the JOURNAL of January 12, in which it is briefly described.

ADDRESS WANTED.—H. S. NOAD writes: "Would you kindly oblige by letting me have addresses of firms who could undertake work as specimens herewith?" — In reply: The specimens appear to be by the collotype process. Apply to Messrs. Morgan & Kidd, Richmond, or one of the other houses advertising in the outer pages of the JOURNAL.

RED STAINS ON COLLODIO-CHLORIDE.—B. WALDE writes: "I am sending you some collodio-chloride prints with red stains on, and should feel much obliged to you for your kind advice." — The spots have very much the appearance of having been caused by minute air bubbles adhering to the surface of the paper when it is first put into the toning bath. If that is not the cause, try another sample of paper.

THE NALDA HAND CAMERA.—INQUIRER writes: "Will you kindly give the name of the makers of a hand camera called 'The Nalda,' Parson's patent? We bought it second-hand, but it is not perfect, and should prefer the makers to put it right if possible to get at them?" — In reply: The Nalda (the name of which was at one time very familiar to us) does not figure in any of our recent lists, and therefore we are unable to give our correspondent the reference. Will some reader oblige?

PHOTOGRAPHY IN BRITISH COLUMBIA.—BOB asks: "1. Are wages good for photographic assistants out in British Columbia? and, if so, (2) could you inform me of any journal used out there for advertising purposes? Also (3) could you give any rough idea what it would cost from London?" — In reply: We fear we cannot be of much help in the matter. 1. We have no means of telling, but we should think wages would not be high. 2. None of a photographic character that we are aware of. 3. Better apply to a steamship company.

DIRECT CARBON ENLARGING.—J. S. POWELL writes: "Will you kindly let me know (if possible) name of maker or agent of the carbon paper for enlarging direct from negative, as in bromide work? I understand it is a very recent production." — We know of no carbon tissue as sensitive as bromide paper, or anything like. Monckhoven, of Ghent, used to make an extra-sensitive tissue for enlarging upon with the solar camera, but whether it is made now we cannot say. With any carbon tissue we expect you would have to use the solar camera or a very powerful arc light.

PHOTOGRAPHY ON METAL.—W. WARRINGTON writes: "A jeweller brought me a piece of bright silver and an old engraving, and asked me to copy the latter on to the former for him. I was very busy at the time, and, as he could only wait three days, I could not undertake the matter. I had intended preparing the metal with various things—tragacanth, beeswax, and so on, and if not successful I was going to send the job to one of the big houses. My process, by the way, was the carbon, of course. I should be very glad if you could tell me how I can make carbons take on a smooth surface such as burnished silver or glass, or if there be a method other than carbon." — If the metal surface receive a thin substratum of gelatine containing a little chrome alum, a carbon picture can then be transferred to it. The substratum will, however, somewhat degrade the polish on the metal. We do not know a better process for the work than the carbon.

AN EMBOSSED PROCESS.—J. HUNTER writes: "I shall feel obliged if you could give me any information regarding Barker's embossing process. I believe it is a quick method of preparing dies by some photographic or etching process for printing type in relief. If you can tell me anything of the process or where I can purchase materials and the right to work it, I shall be very pleased." — We are not familiar with the process mentioned. Messrs. Penrose & Co. supply material for working all the photo-mechanical processes, and it is possible that they can supply all that is needed for this one. Better communicate with them. Their address is Upper Baker-street, Lloyd-square, W.C., and it is possible they can give you the required information.

APPRENTICESHIP.—W. says: "Two years ago I took a young man as apprentice with a small premium—only ten pounds—for three years. He was to have half-a-crown a week for the first year, five shillings for the second, and ten for the third. He is now an excellent operator and printer. Another photographer here, I know, has been trying to get him away for some time past, and has now offered him thirty shillings a week, and the apprentice has given me a week's notice. Can he leave before the end of the three years? I may say the agreement was a verbal one, but made in the presence of two witnesses who will testify to it." — Yes, he can, as he is, and has only been, a weekly servant. There must be proper indentures, duly stamped, to make an apprenticeship binding on either side.

DEVELOPMENT.—W. KEATING writes: "I see mentioned in several papers that amidol will not keep in solution, and yet the directions with it give a formula which they say keeps. Kindly say your opinion. 2. I tried standard development with amidol alone and metol alone. The result showed a thin negative, darkened all over, and no detail. My result with pyro soda was all right. Can you tell me the reason? 3. Can one redevelop a fixed and dried negative? 4. If so, can an under-developed negative be sufficiently developed by this final operation?" — 1. Amidol, in our hands, does not keep for very long. 2. You ought to have got good results with either developer, and we cannot say why you did not if the negatives were rightly exposed. Try kachin or ortol; they are both good developers. 3 and 4. The reply to both these queries is in the negative.

PORTRAITURE.—VELOX writes: "1. Is it possible to take good photographs with only good side light, especially if I employ a good reflector on the shadow side? 2. Can you recommend a good gas light for photographic purposes? Do you know 'The Beaufort Studio gas light,' it has nine incandescent burners? are these the ordinary Welsbach burners, or are they special? is it possible to take good photos with this light, and what candle power would be required? Could you recommend me any book or any firm I could get information from?" — 1. Yes; all the electric lights are used with the hood shape reflector, and excellent portraits are produced with it. 2. We have, personally, had no experience with the Beaufort light; but we believe it answers well. The arc light generally used for portraiture is from 6000 to 10,000 candle power. Messrs. Adamson Bros., 22, Christopher-street, Finsbury, E.C., are experts in artificial light for photography. Gwynne & Co., Brook-street, Holborn, also supply installations for photographic purposes. These are electric light. Of course, any form of gas light will require a much longer exposure than is necessary with the electric light.

REMOVING "SODA MARKS" FROM NEGATIVES: NUMBERING KODAK NEGATIVES.—SYSTEM writes: "1. Would you kindly let me know the simplest method of removing soda marks as shown on the enclosed negative. The marks do not show by transmitted light, but they do by reflected light, and make the negative look dirty. I know they (the marks) may be removed by rubbing the surface with a tuft of cotton-wool saturated with hydrochloric acid, 1 to 60 parts of water, after washing; but this is not always advisable, especially when the films or plates are inclined to frill at the edges. Is there any safe and simple method? Merely rubbing the surface with a tuft of cotton-wool saturated with plain water will not always remove the marks. 2. Also can you tell me of any good method of numbering Kodak spool films consecutively before development, if you start developing without cutting, and what is the best way of pencilling order numbers on them?" — In reply: 1. We have never failed to remove such marks with a pledge of cotton-wool when the plates are taken out of the washing water. 2. Write the numbers *small* on the gelatine film with a black lead pencil.

OZOTYPE AND COLOUR WORK.—SPECTROGRAPH writes: "1. Do you think the ozotype process could be utilised for three-colour printing? 2. Can the necessary colours be supplied for the three printings, from three negatives, so as to represent the colours of the original with tolerable accuracy? 3. Would it be necessary to use an isolating medium between successive impressions, to prevent the first being destroyed? 4. If three colours, which would form grey when mixed, were superimposed, would the effect of the uppermost layer destroy to any great extent the purity of the grey, and the same with mixed colours? 5. What is the most practical process for representing the colours of nature on an opaque ground, such as paper? 6. Is it likely to be of any commercial value to a single-handed worker if introduced as a novelty?" — We scarcely see how the process could be applied in practice, and we do not know if the Ozotype Company supply colour plasters suitable for the work. Better communicate with the Company, or make some experiments in the direction yourself. You will be able to form an opinion as to the commercial value it would be to you. If you are successful, it is very possible it might be.

* * We have again to hold over several reviews, letters, answers to correspondents, and other matter.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

The ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their MS., sketches, &c., at the earliest possible date.

We shall be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who

wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

* * Will secretaries of societies who have not yet sent us lists of officers for inclusion in the ALMANAC kindly oblige us by doing so at once, in order that this section of the book may be proceeded with.

EX CATHEDRĀ.

FROM a circular that has been sent to us we learn that Mr. Henry W. Bennett, F.R.P.S., whose address is Granville House, Arundel-street, Strand, London, proposes in future devoting himself to photographic work as a profession. His specialities will be carbon and platinotype printing; carbon enlargements; lantern slides; enlarged negatives and the working up and improvement of negatives. The claims that Mr. Bennett has upon all the encouragement and good wishes that we can extend to him are undeniably strong. As a photographer of architectural subjects he has won wide distinction for the exquisite qualities he has invariably imparted to his work. But he is by no means a man of one idea only, for the principal exhibitions during many years past have witnessed many evidences of his skill in other branches of photographic production. A frequent contributor to the proceedings and discussions of societies and the pages of the press, Mr. Bennett adds to his great practical skill a most admirable theoretical knowledge. For the work he proposes to undertake he could not be better qualified, and in wishing him the greatest success in his venture we can confidently recommend his printing and enlarging to those who desire very high-class results.

* * *

THE September number of the *Journal of the Photographic Society of India* contains a photogravure portrait of the beautiful and gracious Vice-Queen of India, Lady Curzon of Kedleston, which forms a most charming addition to the fine illustrations our contemporary has recently inserted in its

pages. The negative from which the plate was made was taken by Messrs. Bourne & Shepherd, the well-known professional photographers of Calcutta, "the premier Indian firm." The beauty of the distinguished sitter rendered a pleasing picture inevitable ; but, apart from this matter, there is an allied charm and dignity in this representation of the Vice-Queen's bejewelled figure which single the photograph out for special recognition. The editor of the Indian *Journal* gallantly refuses to admit that the print does justice to the fair original. We must again congratulate our contemporary on the readability of its contents. The following speculation on the possibilities of animated photography will show that some daring things are thought in Calcutta : "If photography, in its ordinary every-day aspect, can record only an evanescent expression forming a single link in the psychological manifestation of the subject, may it not be possible to plumb the inward spiritual depths of a man or woman by a succession of photographs which complete the chain of expression ? 'Animated photography' is so much in the pupa stage of development that the mere suggestion that it may prove the salvation of portraiture will appear to many wildly absurd. And yet the absurdities of one age have turned out matters of fact in another." Even so ; but how many of us, we wonder, would dare submit to having our "inward spiritual depths" made clear to all by photographic or other means ! Very few, we believe, O Indian brother !

* * *

"THE problem of photographing the colours of nature is now satisfactorily solved, and an extensive exhibit of natural-colour photographs by the Colour-Photograph Company, Birkbeck Bank Chambers, Chancery-lane, London, forms the leading attraction at this year's Exhibition of the Royal Photographic Society at the New Gallery, Regent-street." This is the first paragraph of a printed slip that has been sent us. The Royal Photographic Society's Exhibition does not open till Monday next, so that is slightly anticipating matters to speak of "leading attractions" already. One or two extracts from this "advance notice," which has evidently been prepared for the general press, may interest our readers : "The process by which the pictures are produced is known as the McDonough-Joly process, as its essential features were invented independently by Dr. Joly in Ireland and by Mr. McDonough in America, and were patented almost exactly simultaneously on the two sides of the Atlantic in 1894. Since that time large sums of money and a great amount of labour and skill have been expended in developing the details of the invention, but the honour of bringing it to a practical and commercial success lies with the Colour-Photograph Company, of Chicago, and its guiding spirit, Mr. D. K. Tripp, who has completed his success by the purchase of the rights under Dr. Joly's patents, to add to those of MacDonough. . . . The essential difference between the McDonough-Joly process and the processes of Ives, Lumière, and others is that, while the latter have to make separate exposures and separate negatives for the three-colour impressions, as well as three separate colour impressions in their positives for viewing, the McDonough-Joly process makes the three impressions simultaneously, by one exposure, upon one plate, through the intervention of a screen ruled with the three fundamental colours in very fine parallel lines. Further, the McDonough-Joly process can produce prints on paper by methods similar to those commonly in use by professionals and amateurs ; and it can produce photo-mechanical

prints, for book illustration, in great perfection and at very low cost." It will be of interest to note whether success rewards the efforts of the American company to popularise a process that has already failed to "catch on" here, as the phrase runs. We wish the Colour-Photograph Company success in their venture, and can honestly say that, if they achieve it, they will richly deserve it. But it will be uphill work to persuade the general public into accepting colour pictures on glass as a satisfactory solution of the colour-photography problem after several failures in the same direction.

* * *

THE subject of expression in portraiture and the best methods of securing it has recently been dealt with in our pages, and those of our professional readers to whom the subject is of paramount importance may be interested in some physiological aspects of the matter that we do not remember to have seen dealt with before. The ideas are those of Mr. Henry Jones, of the Sydney (N.S.W.) Phrenological Institute, who, in the *Australasian Photographic Journal*, discusses some peculiarities of sitters from the point of view of physique. Mr. Jones says that, when the flesh predominates, and a subject is what people generally call "fat" or "stout," there is a desire to sit in the most comfortable chair and take life easy. Anything or anybody compelling them to "take a chair" with a straight back, such as is often used in the "studio" for "bust" portraits, will not please them. "You will ruffle their feelings, make them feel uncomfortable and discontented. They are homely, jovial people, and their surroundings must be congenial if a reflex of the true feelings is to be seen in their features, and a true natural pose obtained. People in whom the bone predominates are quite dissimilar to the fleshy people. These bony people are rough and ready, are fond of work, and they can put up with indifferent surroundings ; but they prefer solid, firm, and straight furniture. The proverbial studio chair would be more appreciated by this person than the fleshy one, better still if they are allowed to stand. A prominent-browed person should be made to observe, because he is more natural-looking than if he was taken full face with a vacant stare, as is the case in too many instances. Children with round-shaped ears should be attracted to look in the direction of where some musical sound comes from. Those with a fulness just behind the corners of the eyebrows wear a happier expression when any eatable is held up to them in a tempting manner. In the first case, the round ear shows love of music and sounds ; in the second, appetite." Most of this studio philosophy falls within the category of the obvious, but the part of it relating to the treatment of children is based upon reasoning that might be less obscure. It imposes no strain upon the acumen of a photographer to differentiate between the accommodational needs of stout and thin people ; but, if an attentive study of the minute facial characteristics of small sitters is to be gone through each time one of them appears, studio work will become somewhat irksome. Mr. Jones probably knows more about the inexact "science" of phrenology than practical portrait photography.

STUDIO-BUILDING.—II.

IN our recent article upon this subject, so fertile in queries from correspondents, we showed how closely the question of length of studio and the lens employed were interwoven, and we indicated a minimum of close upon thirty feet when full-

ength cabinets and large groups were to be taken. We may now pass on to other aspects of the subject.

The breadth naturally presents itself first for consideration, but there is little that need be said here, save that, for the purpose of being able to take large groups, plenty of width is simply a necessity. Further, a wide studio gives far greater scope for varying the illumination of the sitter, as he can be taken from almost any direction, and many chance and other effects of lighting secured that would never be noticed in a narrow room. There are studios in which the camera moves on rails from one end to the other; but we cannot but think that this is a mistake, as, though work is facilitated, many advantages are lost, the mere shifting of the camera a few feet to the right or left sometimes enabling the operator to get the most advantageous light upon his subject.

We have now to consider the height of the studio, and this has many very important aspects, one of which, in particular, should be first disposed of. An impression prevails that a studio should not be extremely high, on account of the difficulty of reaching the blinds readily while controlling the illumination. This is a mistaken idea. In a lofty studio there is not the slightest occasion for the blinds, on whatever system arranged, to lie in close proximity to the glass. So long as they are clear of any movable object, as backgrounds and the like, they may be arranged in entire disregard of the lines of the roof, and the height of the room may be chosen without any reference to them.

A photographer's studio is generally looked upon, and too often justly so, as a typically hot place. In most cases this is almost entirely owing to want of height, for, granted that it is well placed as regards points of the compass and relation to surrounding buildings, a studio may be kept cool in the middle of summer, although upon whether it be built up against the walls of existing building or is unsheltered from the sun in every direction depends the temperature of the place. Again, the greater the height of any room, as a general rule, the freer from closeness is the air. Thus all considerations combine to cause a studio of lofty proportions to be chosen. There is still another argument in favour of a high studio, the importance of which is paramount. Whatever the form of roof, if the studio is to depend upon its own walls or roof for keeping the sun's rays out, it must be of a certain height. A well-known authority has given 60° as the angle of pitch of roof needed to keep the direct sun out. Adopting this rule, and remembering that the height of the walls is governed by the fact that a background cannot be less than eight feet high for general purposes, we readily arrive at a minimum height that shall fulfil the obviously desirable, if not indeed necessary, requirements for a studio built in the open. It is equally obvious that a typically perfect situation would be not in the open, but under the lee of a high building, which should shelter it from the sun when at its greatest elevation—that is to say, about noon—so that, in this part of the world at any rate, a studio built against a high wall that faced north would have many advantages. Of course, earlier, and more especially later, the protecting wall would be less valuable, as the sun would gradually work round, although, if the wall were, for example, the back of a long row of houses, its protection would continue long enough to be of virtually complete avail.

But, though keeping the room cool is a matter of vital consequence for the comfort of sitters, an end mainly attained by screening the direct rays of the sun in combination with

efficient ventilation, this screening is an absolute necessity in another direction. Under no circumstances whatever can the sun's direct rays be permitted to pass between sitter and lens; in other words, no sunbeams may be seen when looking towards the sitter from the camera standpoint. We have known instances where much trouble has been caused in this way, and quite unsuspected, through the building having been erected during winter and spring, and the sunbeams not having gained access till later in the year, when it is higher in the heavens. When the atmosphere is thus illuminated by the sun's rays, there is no remedy except by dispersing them with a translucent screen or by erecting an opaque screen.

So far, it will be noticed we have not dealt at all with the shape of the roof, but we have felt that it would be best treated after clearing the ground by establishing general principles. Their particular application to this point of the shape of the roof we will consider in a final article on the subject.

Photography and the General Election.—Now that we are in the midst of a General Election many photographers are busy in supplying portraits of the local candidates and those who take an active share in party politics. Just now provincial photographers will have little difficulty in obtaining sittings from their candidates and other prominent persons in politics, as they are all more or less anxious for popularity at such a time as this. The local photographer of little Pedlington, for example, would not be accorded a sitting by the Hon. Herbert Blank in ordinary circumstances; but, if the hon. gentleman becomes a candidate for the Little Pedlington seat, he is only too pleased to sit to the local man or men, and so are many of his prominent supporters of the "upper ten," with the idea of securing voters in the districts, and, usually, good orders follow. At other times these gentlemen only patronise the *élite* of the profession. It is rather a question as to whether local photographers will profit as much by this election as they may have done in some previous ones. Process blocks have now arrived at such a state of perfection that they will often be utilised where silver prints were once required. One silver print only is required to produce thousands of process prints. However, the process prints are usually anything but flattering to the candidates, owing to the wretched paper they are generally printed upon. Some we have seen are very much on a par with the portraits issued from Scotland Yard of culprits "wanted." Such portraits as those, we fear, will not much aid the candidature of an aspirant to parliamentary honours if he happens to be a stranger in the district.

Coloured Portraits.—In our issue of last week Mr. A. T. Newton directs attention to the subject of hand-coloured photographs, chiefly for advertising purposes, with large-size pictures. In the opening of this article Mr. Newton says: "To many the bare idea of colouring a silver print or photograph by any other process when printed on paper may appear an out-of-date operation, and quite beyond the limits of good taste, in these days of monochrome and matt-surface productions, and but few professional photographers are found giving any countenance to it beyond the finishing in colour of a certain class of portrait enlargements well known in the trade." What Mr. Newton says in this respect is quite correct. But why should it be so? At one time coloured photographs were a very lucrative part of the portraitist's business, but now they are quite neglected. Indeed, if we now visit a dozen photographers' reception-rooms, we shall not see half that number of coloured specimens exhibited, except they be expensive enlargements. This used not to be the case. In former days quarter, half, and whole-plate delicately tinted and fully coloured specimens were to be seen everywhere, and very profitable they proved; but that was before the *carte-de-visite* and cabinet pictures. Why, since then, their total neglect? It may possibly be accounted for in this way: When the first-

named style of portraits was introduced, they became such a rage that portraitists had little time to think of anything else, and so when the cabinet came to the fore and superseded it. Hence coloured portraits fell into oblivion, and have not since been resuscitated. Just now the public taste is for pictures generally in colour. That being the case, why should it not extend to portraits, if they were made a feature of by photographers? Face and hands of the half-plate size delicately tinted used to be charged for from 5s. upwards extra on the picture. The 5s. work did not take the artist, usually a lady, more than about an hour, yet it was effectively and well done, and it is manifest that it carried a good profit to the photographer. The same might well be done now with cabinet portraits. It would give remunerative employment to many lady artists as well as bring grist to the photographer's mill, if it were made a feature of. That there is still a taste for coloured portraits is evidenced by the craze there was a few years ago for the daubs, yclept "crystoleum painting," which was chiefly confined to portraiture.

Despoiling the Lake District.—Since the scheme was first mooted for connecting the different portions of the Lake District, under the Light Railways Acts, there has been a great flutter of excitement amongst artists and others. Every one knows how even telegraph poles and wires often mar the scene when they have to be included in a photograph. Not the less would the overhead system of electric traction mar the view if the standards and leads had to figure in the picture, though a painter could, of course, leave them out in his depiction of the scene. It is not often, however, that roads are shown in pictures of the Lake District, so that, after all, the projected railway would not so greatly interfere with the beauty of the scene as some would lead us to imagine. There is another side to the question that should be taken into consideration, namely, convenience and utility. Photographers who have spent their holidays in the Lake District know full well the inconveniences and the cost of getting from one part to another, when they have to depend upon coaches and similar conveyances, agreeable as the rides may be to those whose purses may enable them to take them. There is no question that a light railway connecting the principal places in the district would be a great boon to tourists, photographic or otherwise, with limited means. We read, and it is significant, in one of the daily papers that all the agitation has been promulgated by residents in the neighbourhoods, who have purchased plots of land and erected unsightly modern houses upon them, who fear that tourists and "trippers" would be brought in large numbers by the light railways, and so disturb their quietude. We suspect, however, that they will eventually have to give way to progress. The pleasure of thousands is paramount to the comfort of a small few. A short time back we read that the light railway scheme had been abandoned, but since then we have learned that it has not, but is only in abeyance for the present. Sooner or later, and there is no question about it, the different parts of this beautiful district will be brought into convenient communication, as has been the case in the equally beautiful spot, the Isle of Wight—and the Isle of Wight is none the worse for the innovation.

Geological Photographs.—A wide field of photographic work and interest was opened up at the recent meeting of the British Association, when Mr. Monckton dealt with the tenth annual report of the Committee for the Collection and Preservation of Geological Photographs. He said the only new contributing counties added to the list were Anglesea and Meath, but several counties had much improved their photographic contributions. Upon the whole, he believed that Yorkshire had every reason to be proud of itself for the way in which it had contributed to the splendid collection of photographs possessed by the Section. The total number of photographs from Yorkshire was 446. Mr. Monckton made the interesting announcement that the question of publishing a typical series of geological photographs had been considered, and, as a sufficient number of subscriptions had now been obtained, it had been determined to issue twenty photographs for each of three years, both as

prints and lantern slides. Local societies might obtain the loan of the duplicate collection. The work of the Society had been carried on vigorously, but there was still a great deal to be done.

Sensitiveness of Metallic Silver to Light.—During the same meeting Major-General Waterhouse read a paper, in the course of which he stated that he had found visible photographic images were formed on pure silver foil or silvered glass when exposed to sunlight in exhausted glass tubes; in thin films the effect penetrated to the back. Electrically deposited silver was also sensitive. A very curious action of light upon glass had also been observed. A silvered glass plate was exposed for about a month under a cut-out screen of thin aluminium, the unsilvered side of the glass being in contact with the aluminium, and not protected from the air by a covering glass plate. After exposure the plate was put aside for a few days with the exposed glass side in contact with the silvered surface of another piece of polished silvered glass, which was then found to have received an impressed image from the glass of the design cut out of the aluminium screen. The image was quite visible, clear, and sharp, and somewhat similar to the images directly impressed by light. Several days afterwards a second similar image was produced in the same way by contact with the glass upon another freshly polished silvered glass plate. These experiments of General Waterhouse, which follow others that have taken the same line of work as a basis, are being continued. Yet another paper of photographic interest, making some half a dozen in all that were presented to the British Association, was one by Professor S. P. Langley, Secretary of the Smithsonian Institution, describing the infra-red solar spectrum obtained by means of a 60° rock-salt prism. Curves were shown to illustrate the relative distribution of energy in the prismatic spectrum; in them each Fraunhofer line caused, by its relative coldness, a notch or deflection. The curves were produced automatically by photography, the spot of light being reflected by a galvanometer itself in connexion with the bolometer. The main result of the observations was the comparison and measurement of 579 absorption lines between the main lengths of $0\cdot7\mu$ and $5\cdot3\mu$. By the employment of a glass prism of greater dispersion than rock salt, the total number of photographically determined infra-red lines had been increased to 740. The accuracy of the measurement was shown by the fact that the position of most of these lines was determined within five or ten Angstrom limits. A general effect of the investigation was to reveal the marked changes in absorption in spring, summer, autumn and winter, the most conspicuous seasonal changes being between spring and summer. On the whole, it cannot be said that the scientific aspects of photography were neglected at Bradford whilst the annual Parliament of Science was in session.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCROMY.

I.

In the first place it will be necessary for me to explain what I conceive to be the *object* of a history of the gradual development of a branch of science—an object which will be consistently followed in treating of photochromy; and, in the second place I will give a preliminary sketch and make some remarks on the *order* in which the matter is placed.

In most cases it is, and always has been, the custom to publish original researches in a form which affords little or no clue to the actual path of discovery.* The reason for this is either that the necessity for such a clue is not recognised, or—and this reason, fortunately, is more rare nowadays—the deliberate suppression of all indications of the path of discovery. It is not difficult to imagine how a mind not given to accurate self-analysis†—and such a mind, far from being incapable of the greatest powers of investigation, is often found in great investigators—can be led to such ideas; but,

* I am aware that this custom is less common in natural science than in mathematics, and this fact, while not, of course, affecting the argument that students of natural science may derive great benefit from the study of mathematics, constitutes, in my view, a most important advantage of natural science at present, and one from which mathematicians might well learn better ways.

† Cf. Mach: *Popular Scientific Lectures* (Chicago, 1898), pp. 279, &c.

and this seems very extraordinary to me, others (learners) often fail also to see this necessity in original discoverers. Against such people it would be easy to quote authority—Gottfried von Leibniz, Joseph Louis Lagrange, Dr. Ernst Mach*—but it is not, of course, permissible merely to quote authority.

However, it is perfectly obvious that such clues are very valuable as examples of research, but for other objects (for instance, the thorough comprehension even of others' works), their utility is not so obvious; but, as their value as examples of research alone suffices to more than justify, to necessitate, their appearance, it is useless, for practical purposes, to dwell longer on the proof of the utility for thorough comprehension than to say that, from premises that would be granted by every one, one can deduce, in strict logic, this proof. This has been done, I think, in essentials by Mach.†

We now come to the function of a history. To trace the natural connexions of ideas, often in works where these connexions are suppressed, must be the function of a history. More than this, the distinction between the text-book and the history must ultimately break down; the text-book for all whose object is to get any true knowledge, and not a valueless erudition, in order that an examination may be passed quickly, that a trade may be "acquired," where time is the object and efficiency is not considered must become a history.‡

And, lastly, the order in which the leading discoveries in interference photochromy is presented is nearly unessential, for the reason that, up to the time of Lippmann, the discoverers were independent of one another. Lippmann and Lord Rayleigh did not, till long after their ideas were formed, hear of Zenker, nor Lippmann of Rayleigh. Lippmann's investigations, as Zenker's,§ take their origin with Edmond Becquerel. Thus, properly speaking, one should begin with Becquerel; it will, however, be more convenient to treat him with Zenker, and, in the first place,|| we will attempt to trace the ideas of Lippmann.¶

About 1883, Gabriel Lippmann, then "maître des conférences" at the Sorbonne, wished to show stationary waves to his pupils by producing them in a fluorescent substance. "L'expérience," he says, "mal faite, ne réussit pas." He afterwards thought of photography for fixing these stationary waves, but was stopped for years by the difficulties of obtaining sensitive media without grain. Finally, in reading Dr. Eder's *Handbuch der Photographie*, he saw that sensitised albumen was *kornlos*. He then took up again his experiments, and succeeded, in 1891, in fixing the spectrum.

It was only after this success that his attention was drawn to Zenker's *Lehrbuch der Photochromie*, and afterwards to the work of Lord Rayleigh, but he had long known (before beginning his researches) the work of Edmond Becquerel.** In this work, says M.

* Though these three names were taken somewhat at random, it is interesting to notice that they all, explicitly or implicitly, lay special emphasis on the economical side or character of science. Out of this an argument might be developed against those who maintain that an historical method is noteconomical in effort required to grasp ideas, an argument which at first seems to have great strength. Another, who was a great symbolist, and therefore paid attention to economy of thought, and who ranks with the two other greatest men in this respect—Leibniz and Lagrange—occurs to me, George Bode. He (*cf.* preface to his *Differential Equations*) emphasised the importance of historical methods.

† This seems to be one of the important consequences of the opinions which led him to write his "Mechanics and Heat" (*cf.* *Popular Science Lectures*, &c.).

‡ It is possible that, in the future, the truth of this may be so generally felt that memoirs will be published in a form which will make them bodily transferable to a history. If they describe thoughts, they will become much more detailed, because they describe, and also much shorter, because they describe only thoughts. I am not considering here cases in which it is necessary to give, in non-permanent memoirs, long tables of experimental results; but, as for these, they do not need description in a history, only the thoughts at their foundation, and, in the nature of things, they are superseded by others more perfect, and so on, until ultimately all is comprehended in one central point, a mathematical formula. In this desirable state of things, histories could almost be made by machinery, or by certain professional teachers provided with scissors and a gum-bottle.

§ After Lippmann, in a letter to me of September 8, 1900.

|| Reason: Chiefly because the good libraries in Cambridge are yet not accessible; they (at least, Trinity) are closed during the end of the Long Vacation. (See also the end of this paper.)

¶ I am indebted to M. Lippmann for the general sketch of the *marche de ses pensées*.

** *La Lumière, ses Causes et ses Effets*, 2 vols., Paris, 1868. (The first volume is devoted to the "causes," the second to the "effects." Thus the second may be considered as a treatise on the science of "photography," photography being used in the wider sense.)

Lippmann, "Becquerel fait intervenir les ondes stationnaires, comme plus tard Zenker. Zenker n'a fait que développer l'idée de Becquerel. Ils ont eu tort de ne considérer que le sous-chlorure d'argent." I shall return to this important remark later, when considering Becquerel and Zenker, and, for the present, shall only quote from a paper read by Becquerel before the French Photographic Society in 1857* (therefore long before the publication of his book): "These effects show that it is not by an action of the kind which gives place to the phenomena of thin layers that the substance reproduces the coloured impression of light, but on account of a special action, which causes the curious substance above named to have the faculty of only diffusing rays of the same refrangibility as those which have acted chemically upon it."

Lippmann's first communication of his process was to the Paris Academy on February 2, 1891.† He very briefly (as is usual with notes in the *Comptes Rendus*, on account of the restrictions placed by the Academy on the length of communications) laid down the necessary conditions for this "interference" method—the presence of a reflecting surface and practical grainlessness of the film.‡

With the publication of the *method* of photochromy, discovered by Lippmann,§ ends the first period of the history of interference photochromy. Having seen how a *method* arises from an abstract principle, it will probably now be of greater interest to photographers than before to trace the history of this principle, applied first by Becquerel and Zenker merely as an explanation of certain experimental results, then independently applied by Lord Rayleigh to the same purpose, and also—what is important as showing the gradual and organic growth of our sub-science—faintly perceived a possible new method.

The second period will begin when interference photochromy, as we understand it now, is generalised so as to include all processes (and there is a strong probability of there being at least one other) depending immediately on the purely metrical properties of light waves—the arranging of matter in correspondence with these metrical properties so as to be capable of returning colours by reflection or by transmission or both.

In the next place, then, we shall consider Edmond Becquerel and his observations on stationary waves. PHILIP E. B. JOURDAIN.

"PLASTIC PSYCHOLOGICAL SYNTHESES" AT THE PHOTOGRAPHIC SALON.

The Eighth Exhibition of the Photographic Salon consists of 239 prints contributed by 105 exhibitors. Of the latter, four are Frenchmen, who between them are responsible for 22 prints. American exhibitors total up to 28, and the comparatively large number of 70 examples are due to them. Nothing from Belgium, Austria, Germany, or Italy, is shown. The American Section is the predominant feature of an Exhibition the like of which we have not seen before, and upon which we are not eager to look again.

It is a difficult thing to take many of these American "photographs"—for so, we suppose, they must in courtesy be styled—quite seriously. With many of the productions of Mrs. Kasebier, Mr. F. Eugene, Mr. Clarence White, Mr. Watts Lee, and Mr. Holland Day, that have excited derision on the other side of the Atlantic, the pages of the American magazines and exhibition catalogues have long familiarised us, and habitual readers of the JOURNAL will not need reminding that, between the months of January and August of this year, we reprinted from those publications many references to the deplorable travesties of photographic

* I have published a full translation of this paper in THE BRITISH JOURNAL OF PHOTOGRAPHY, May 12 and 19, 1899, pp. 292-294 and 309-311. For the reference see p. 309.

† *Compt. Rend.*, 1891, cxii. 274, 275. Further papers, Orthochromatised plates, dichromatised gelatine or albumen," *ibid.*, 1892, cxiv. 961, 962, and cxv. 575.

‡ For further particulars as to Lippmann, see my "Further Contributions," *Phot.*, June 22, 1899, 415; *Phot. Ann.* (C. H. Bothamley), 1892, 111, 112; 1893, 116-119; 1894, 97, 98; 1895, 190, 191; 1896, 179, 171; and 1897, 202. For M. Labatut's work (1891), see "Further Contributions," pp. 415, 416 (full translation).

§ M. Lippmann, it is interesting (but not surprising to any one who has at all studied investigators) to note, did not think his thoughts very important: "Je n'ai point noté l'histoire de mes idées sur la photographie, ne les trouvant pas très importants."

work which a handful of American photographers, encouraged by the adulterous writings of neurotic "appreciators," were deceived into believing "artistic" or "pictorial." These things are to be seen in Piccadilly just now, and, no doubt, some of them will be reproduced in books and annuals during the next few months. There will thus be plenty of opportunities for English photographers to examine the newest pictorial work (*sic*) that has reached them from a distance, and those of them who are sufficiently interested in the matter to keep in mind what is exhibited year by year will have no difficulty in perceiving that the productions of these very modern amateur photographers are, if anything, less defensible than the mere blurs and fuzzytypes that were mostly laughed out of the English exhibitions a few years ago. A specimen of the critical writing, which must in some measure be held responsible for the photographic inanities produced in America and now sent to this country for public exhibition may here be usefully quoted. The critic or appreciator has taken the work of Mr. F. Holland Day for his theme:—

"He is a psychologist, ever on the alert, ever seeking for this—to grasp and to express in material form the individual characteristics of his subject. What do I care for the blood flowing beneath the skin, for the network of swelling and throbbing veins? What matters the sight of the straining muscles full of life, if the invisible part, the mystery of this living being, be absent from the picture, if I cannot enter into communication with its spirit? I care not how brightly, how truly, the eyes may shine, if I know nothing of the thought, the fancy animating them. Even a flatness, or the projection of a bone, or the irregularity of a line, a deformity even, gives evidence of some habitual trait which, if at times contradictory, is, nevertheless, always full of interest. . . . As I said before, Mr. Day's art is one of delicacy and subtle refinement. To prove this, examine carefully the figures he so delights in. His subjects are intensely alike with the inner life, they seem heedless of all that might tear them from their own secret dreamings. They make no attempt at futile agitation, but are content with the thoughtful gestures of repose, the special poses and attitudes of pensive grace, in which the artist has fixed them. Look, for instance, at his portrait of Miss Ben Yusuf. How well he has caught her habit, her ordinary way of being, 'all her little ways.' One feels at once that the artist has photographed her with his heart, if such a thing can be said. The portrait thus conceived becomes a plastic psychological synthesis of the person represented."

Plastic psychological synthesis? Plastic psychological fiddlesticks! As we remarked in March last, when reproducing the article of which the above rhodomontade is an extract, the portrait so referred to was a very ordinary photograph of a tastefully attired young lady leaning against the door of a room. But Mr. Day—of whose striking figure work some few years ago we have the most vivid recollection—is not the only victim of this hysterical foolishness: Mr. Eugene, Mr. Clarence White, and Mrs. Kasebier have all been subjected to it, and, if we may trace back effect to cause, these worthy people, who can make good photographs if they choose, devote so much attention to the cultivation of the plastic psychological synthetic that they have clean forgotten all they may have known in their early days, and obviously stand in need of a few elementary lessons in posing, lighting, printing, and so forth. Are there no evening polytechnics in New York, Boston, and Philadelphia?

Those of us who have watched the drift of that new movement of which so much was said eight or nine years ago, are not astonished that it has culminated in the production of work which is the very negation of good photography. We saw it coming—this Cult of the Spoilt Print. To be in this movement you must take a negative hap-hazard and neglect all considerations of lighting, composition, definition, and other devices of the ignorant. Preferably make a portrait of some person whose likeness you may wish to bury in a mass of grey shadow. Pay particular attention to your printing process, and select one which gives you a great amount of "personal control." With gum bichromate it is easy to brush away as much of the pigment as you choose, but the process is not one to be recommended save in cases where it is desirable, from some cause or other, to raise strong doubts as to what was in front of the camera when the shutter moved or the cap was taken off. Local development with glycerine and treatment with a salt of mercury is an easy plan of securing "washed-out" effects, or, failing mercury for the flesh tint, a little of the iron may be left in the paper. It is a splendid yellowing agent. Care must be bestowed on the trimming and mounting. If the subject is a portrait, run the knife through the back of the head and shoulder. The edges of the print should be left rough. In mounting, any position but a central one should be chosen. Brown paper is an excellent support for photographs, and it takes pencil or brushwork well, thus giving you scope for

making a feature of your signature or initials, which, however, must be neither legible nor intelligible. The details of framing vary with the individual. A hen-coop supplies very good material for some purposes. On the other hand, the *passe-partout* system, which went out of fashion a quarter of a century ago, nowadays looks novel and uncommon.

And of such is the Cult of the Spoilt Print! Surely in this matter the lowest depths of folly have been plumbed! It is a small, as well as a painfully poor, Exhibition, and exceedingly dear at a shilling, we are bound, in common honesty, to remark, unless the visitor, to quote the phrase from *Pickwick*, "takes it out" in tea. The little wall on the left as you enter bears many repulsive-looking prints, for which those responsible for the hanging considerably—or shall we say ironically?—supply a powerful corrective in No. 36, Mr. H. Walter Barnett's magnificent platinum photograph of a helmeted girl, with flowing hair and a handsome, if not very saintly, face, called *Joan of Arc*. How this beautiful bit of photography seems to shame the wretchedly weak things by which it is surrounded! Mr. Davison is in many moods at this Exhibition. He shows large and small portraits, tree studies, and panoramic marine views, some of which owe not a little of their effect to Indian ink, and, we believe, Chinese white. We like the snap-shot of moving figures on *Lowestoft Pier* (No. 32). In these little studies Mr. Davison manifestly aims at delicacy of treatment; but, on the whole, we do not think that this year he has given us of his best. Nos. 15, 19, 24, 35, 38 are shocking examples of bad photography, no more no less—a waste of good printing paper, and beneath criticism. We liked No. 44, a pleasing little portrait of the *Dean of York*, by Mrs. Archie Crommelin. The ecclesiastic is seated facing a bright light, and the effect is agreeable and natural. *Behind the Scenes* (No. 50), by Mr. Demachy, is a clever study of *dansesuses* at the wings of a theatre, printed in gum, of which process Mr. Demachy is by far the ablest exponent. We admire the consistency with which Mr. J. M. C. Grove sticks to his ideas of what constitutes pictorial photography. He always showed blurs, and we suppose always will. The "gums" that he sends here are explained by their titles, without which it would be difficult to say what the subjects were supposed to be. Mr. Eickemeyer has dressed up a pretty girl holding up a pretty child, put nimbi round the head, and calls the result *Madonna*. It is a very pretty photograph indeed; but, in our humble opinion, sacred and quasi-sacred subjects are best avoided by those very unidealising instruments lenses, cameras, and dry plates. Mr. Archie Cochrane's *Bonne Bouche* (No. 65) might be anything but what it purports to be; the boy's face and what he is putting in his mouth are so indistinctly rendered, that without the hint from the title we should not know what it was all about. We are a little curious, too, concerning No. 93, *When the Heart is Young*, by Miss Bessie Stanford. Two little girls are shown playing ball near a window, and the disc outlines itself sharply and clearly against the light. Was this in the negative or not? We should think a shutter photograph of a falling ball indoors somewhat difficult to get. No. 151, by Mr. J. C. Warburg, a group of four children and a man, is entitled a *Carpenter's Shop, Holland*, but the shop, if such it is, cannot be said to form a prominent part of the picture. At all photographic exhibitions we invariably meet with curiosities of titles. *Autumn Mists* (No. 159), by Mr. W. Thomas, is one of those productions which may be either very good or very bad. Looked at from various distances, we could see nothing in it but the effect of blur. Frank Sutcliffe's *Fisherman's Daughter* (No. 107) shows the crouching figure of a girl looking, presumably, out to sea, but there is nothing in the photograph to indicate the relationship of the young lady to a "toiler of the deep." Why will exhibitors indulge in these enigmas? Mr. Holland Day adds to our perplexity. For three of his pictures, which, to do Mr. Day justice, are not in his "Spoilt Print" vein, he asks the modest sum of ten guineas each. One is about half-plate size, entitled *Mother and Daughter*, and is a somewhat sombre little interior group study. We fail to see value for money in this, even granting its possession of plastic psychological synthesis—which we do not.

This exhibition is a curious mixture of the photographically good and bad, with a predominance of the latter. Again and again we looked at some of the things on the walls, only to be forced to the conclusion that they were hung because their merits were of a negative kind. But even a Salon is not all bad. This year, however, the things that are good and admirable are fewer than usual. To Mr. Charles Moss, perhaps, belongs the honour of the greatest advance. His two large "gums," No. 94, *The Seashore*, and No. 183, *Thunder Clouds*, are broadly executed bits of work, full of force and conviction. Mr. Moss has done nothing better than these. But photography in its best and non-“fake” aspects is well represented by the works of Messrs. J. Craig Annan, Karl Greger, H. P. Robinson, Ralph

Robinson, Harold Baker, and F. Hollyer, who, however, must find it difficult to avoid repeating themselves. The outdoor figure subjects of Mr. Annan show his very able photographer's mastery of lighting and composition. There is always a hint or two to be gained from his style of treatment, even though the student cannot avoid the reflection that the results are reminiscent of the work of painters. Mr. H. P. Robinson's hedge-side studies, with gracefully-posed female figures, are full of brightness, roundness, and most pleasing contrasts of light and shade. Mr. Ralph Robinson's little portrait studies are simple and delicate, and never fail to please. A level-headed man, we hardly think this worker is likely to be misled into wasting his time and abilities in making bad photographs by the aid of glycerine and other messes. The series of portraits by Mr. Hollyer happily show that he has abandoned the eccentricities of cross-lighting to which he was at one time treating us. Of Miss Weil's contributions, she is happiest with a very graceful study, No. 102, *Lady with Muff*. In fanciful portraiture of this order she is usually successful, and her prints have a depth, richness, and vigour which make the bilious glycerine-mercury abominations of her compatriots difficult to tolerate. Portraiture of a recognisable kind comes from Mrs. Kasebier—No. 116, *Mr. W. H. Lee*. The lady will be well advised if she sticks to work of this kind, and leaves plastic psychological syntheses severely alone. We are very pleased indeed to meet an old exhibition friend in Mr. Shapoor N. Bhedwar, who in No. 120, *With Idle Love Thoughts Pining*, shows a glowing bit of portraiture, the figure of the beautiful blonde being posed with that difficultly acquired art which conceals art. Mr. Craigie is successful with a profile portrait of a lady; but it is obvious that he was aided in the result by the graceful and photographic outlines of the fair sitter's head, face, and throat—a thing one cannot always reckon on in portraiture. Perhaps Mr. Craigie is at his best in (No. 190) *Scotch Firs*, an excellent bit of work firmly handled. C. Puyo, in (No. 208) *Fleurs d'Avril*, earns our thanks for a brilliant effect of high lights. A word of praise is due to Miss E. L. Watson for (No. 180) *Head of a Young Girl*, the best of the glycerine prints. The photographic qualities of the negative are so manifestly good that we are forced to wonder why "faking" was considered necessary; a good print could have been obtained in any ordinary medium, such as carbon, sepia platinum, Velox, &c.

As regards the display as a whole a little plain language becomes a duty, from the performance of which, however unpleasant it may be, it is a sin to shrink. The Eighth Exhibition of the Photographic Salon is an insult to the public upon whose support it relies to pay rent and other expenses. It does incalculable harm to photography by attracting to it the contempt of those who have no sympathy with the prostitution of a beautiful method of graphic expression to the lamentable idiosyncrasies of those whom Nature, for some inscrutable purpose, has endowed with a passion for the grotesque and the ugly, which may deserve our pity, but neither our admiration nor our imitation. We live in a free country, and fortunately, or unfortunately, there is no law to forbid people debasing the powers which sixty years of photographic research and progress have placed within their grasp; but when the painful productions of these perverted uses of photography are dragged from the impregnable security of privacy and held up to public view, then, in the minds of all sensible photographers, scorn, disgust, and contempt dispute for pride of place.

STOPS, LENSES, AND PERSPECTIVE.

A paper read before the Royal Photographic Society.]

THE method of measuring or numbering stop apertures, as published officially by the Royal Photographic Society, is, I think, rather out of date. The method now employed for Continental lenses is to get the efficient aperture by focussing the sun on the ground glass, substituting for the ground glass a piece of ferrotype plate with a pinhole in it, putting a light behind the pinhole, and measuring the circle of light on the front lens. I cannot see why the old fashioned method of the actual diameter of the stop aperture should remain on the Society's books as the official method; that which I have described is used by all the best lens-makers, and I think the Society should expunge the other plan from its records. The U.S. stop apertures are equally antiquated, only f-8, f-16, &c., are now used.

I have here four lenses of the same focus, but with working apertures of f-2·3, f-5·4, f-7·7, and f-11·3 respectively. In my own experience I prefer the f-11·3 lens; I seem to get sharper images with it than when using the other lens stopped down to the same extent, and I put it down to the thinness of the lens. There is no room for the light to go backwards and forwards inside, there is less stray light in the camera; and I

believe that a f-5·4 lens, for instance, stopped down to f-11·3, will never give as good results as a f-11·3 lens will give at full aperture. I have never seen any statement in print to that effect, but in practice I find that it is so, not only with big lenses, but also with cinematograph lenses, and I attribute it to the fact that there is less reflection and less stray light in the camera caused by the lenses being smaller in diameter and thinner.

The usual method of selecting lenses for cameras of different sizes is, I think, not quite satisfactory. I do not think it is on the right basis, and I want to propose some considerations that I have not found mentioned in any photographic book.

No person of normal sight can see any photograph correctly—perfectly correctly—unless it is at a distance of at least 10 inches from the eye. As a rule, I believe, the distance is about 20 inches. I find that nearly every one holds a newspaper 20 inches from the eye. Plates, &c., on a table are also about 20 inches from the eye. I think, however, oculists put the distance at 10 inches. For prints on paper I think no photograph should be taken with a lens of less than 10 inches. If, in the case of small cameras, half-plate or quarter-plate, a lens must be used of less than 10 inches focus, the lens with which the photograph is taken, or a lens of approximately the same focus, must be held to the eye in order that the image may be seen correctly. If a photograph is taken with a 5-inch lens, and it is desired to observe it correctly and comfortably and with correct perspective, and without holding a lens to the eye, it is necessary to enlarge the picture; that is to say, if a quarter-plate picture has been taken with a 5-inch lens, it must be enlarged at least twice, if not four times. The resulting picture is equivalent to one taken with a 10-inch or a 20-inch focus lens. It could then be held at a comfortable distance from the eye and seen correctly.

With regard to the rising front, a photograph taken with a raised front and the camera tilted must not be viewed with the eye exactly opposite the centre. At photographic exhibitions I do not think the hanging committees consider whether the pictures were taken with a rising front or not, but they should do so if the pictures are to be correctly seen. I propose to use an Abney level whenever I use the rising front.

This instrument can be carried in the pocket, and vertical angles can be very easily measured with it. Then, if a picture is hung on the wall, I should place it at such a height as to get the same angle, from the usual point of observation, as that from which the photograph was taken, and then the object will be seen correctly.

In taking tele-photographic pictures the level could be used in another way, by placing it on the baseboard of the camera, as the rising front is not usually used for tele-photo work.

I have here a print taken with a tele-photo lens giving about ten magnifications; it must be held at a particular angle above the observer's eye, and at a distance of eighty inches, to be seen correctly. If one looks at the centre of the picture, it appears absurd, but when held in the proper position it is seen quite naturally.

In the same way, an object taken with the camera perfectly level should be hung exactly opposite the level of the eyes, standing; if it were hung in a room, hall, or where it would generally be seen by persons who were sitting down, it should be placed at a suitable angle from the position at which it is usually seen.

I strongly object to photographs taken with very wide-angle lenses. I think, first of all, that they are absurd. In the case of a church tower, where a wide-angle lens has to be used to get all the subject on the plate, the print must be seen in a particular way, or, if enlarged, it must be enlarged to a considerable extent; as such subjects include a larger angle than can be seen by the eye at one time, the degree of enlargement must be such that the observer must turn his eye from side to side to see different parts of the photograph. I therefore suggest that a photograph of a church tower should be taken just in the way that the eye would look at a tower. If we are close to a rather tall tower, in many cases it will not be seen entirely without movement of the eye, and I suggest that such photographs should be taken in sections, at different angles, and then joined together—I think that can be satisfactorily done—and then the photograph of the whole will be natural. I think it would also, as a rule, have to be enlarged, or taken with a lens of very long focus, so that it could be held at a sufficient distance from the eye.

In connexion with the use of the Abney level, I should have mentioned that it does not matter how much the rising front is used, or if the camera is tilted as well. Cross lines must be used on the ground glass, and the object at the intersection of these lines must be observed with the level and the angle read off.

I think it is too much to expect that exhibitors will state on their photographs the angle at which they were taken and foci of lens used;

but still I think the hanging committee might notice whether a picture has been taken with the rising front or not, and hang it accordingly.

It is well known that artists often use very long paint brushes, and you will find that in a gallery people stand at different distances from the picture so as to focus it to their eyes.

As regards catalogues of lenses, I do not know whether it would be possible to adopt some other method than always suggesting, say, a 5-inch lens for a quarter-plate. I think it is a mistake to call any lens a half-plate or quarter-plate lens; and, as far as I am concerned, I never use that method. I suppose we shall hardly yet be able to have a catalogue simply giving the diameter of the image covered with different stops, but I think it would be the ideal arrangement.

Some time ago a member showed some prints from negatives taken with lenses of different foci; he preferred one taken with a rather short-focus lens, but I thought the long-focus one was much better. I think short-sighted persons will naturally prefer photographs taken with a short-focus lens, because they can hold them nearer to the eye; and those who are far-sighted will prefer pictures taken with a long-focus lens, and I think that, as a general rule, they are more pleasant to the eye. I have always found that objects seen through a telescope appear very beautiful; and I believe that, the narrower the angle at which an object is seen, the more comfortably it may be seen, and that, the wider the angle, the greater is the strain upon the eyes. I have known field glasses to give a very wide angle of view, but they have had to be dropped very quickly, because they seemed to hurt the eyes; and experiments made by my firm have borne this out. It has been found, too, that microscope eyepieces giving a very large angle produce a strain upon the eyes; some day I hope to get an eyepiece made with an iris diaphragm, so that the angle of view may be made very small, and I am sure the eye will be made more comfortable. Microscopists and people who use telescopes have found this to be the case, and I believe it is the same with photographs as well.

J. H. AGAR-BAUGH.

In the course of the subsequent discussion, Mr. W. E. Debenham said that, like Mr. Baugh, he used the swing back as little as possible, and he thought this was the general practice. If the rising front was used and the camera kept square, and it was desirable to register so exactly the height of the line of sight, it would be simpler to put a measure on the front of the camera, and to notice how much the lens was raised, than to use the quadrant level as suggested. If the swing back was employed as well as the rising front, a quadrant might be useful. With regard to the suggestion that a high tower should be represented by a series of two or three photographs joined together, the adoption of this method would cause a straight line to appear as a number of straight lines with angles between them, or an infinite number would be represented by a curve; but in either case the result would be a falsity, and in his opinion a more offensive falsity than would be produced by taking a single photograph of the tower with the camera back upright. As to the objection to the use of wide-angle lenses, although a narrow-angle was more agreeable to the eye, there were many views which could only be taken with a wide-angle lens, and were we to deny ourselves taking such views? He should say certainly not. It was sometimes said that the perspective in any photograph was right if the view did not include an angle of more than 60°, and that beyond that the perspective was false. This was a mere arbitrary statement, without foundation in fact. Of course, the narrower the angle the less one would see of distortion by displacement; but the President would probably remember that he (Mr. Debenham) once photographed a series of globes which were within an angle of 60° and some of which showed as decided ellipses. There was really no definite point at which what might be called distortion began or ceased. As soon as the centre of a flat plate was left a representation was obtained which was not true unless it was looked at from a particular point, and the greater the distance from the centre of the field the more conspicuous did the distortion become. In a very wide-angle photograph of a group, where the photographer could not help himself, the side figures would appear very much distorted by being broadened when looked at opposite each figure instead of from opposite the centre of the picture.

Mr. T. Bolas, referring to the subject of wide-angle lenses, said it was often stated in books that vision could only include a very narrow angle, he thought about 60°; his eye, at any rate, could see with fair definition over 120°, and it was proved in this way: Set up three lights, one axially, and the other two in such positions as to subtend a given angle to the eye, say 120°; look at the middle light steadily, and then extinguish all the lights or look away; if then one sees the "ghosts," or retinal images of all three, the eye must have included that angle when

the middle light was looked at; naturally, the two outer lights should be rather more intense than the middle one. Other experiments of a similar character might be mentioned.

Mr. H. W. Bennett thought that, in using a level to determine the extent to which the front had been raised, Mr. Baugh was going a rather round-about way to find out something that should be visible from the picture itself. In an architectural photograph, taken while the swing back was kept upright, the extent to which the rising front was used would always be indicated by the distance below the centre of the picture that the perspective lines became perfectly horizontal. In landscape work, too, the distance of the horizon below the centre was the amount that the rising front had been raised above the centre. With regard to the use of wide-angle lenses, although there was a general objection to the inclusion of a wider angle than was absolutely necessary, there were, as Mr. Debenham had said, many subjects that could only be taken with a wide-angle lens and where the circumstances were such that the composition would be thoroughly bad if a narrow-angle were used; and it appeared to him that the general result of the picture should be considered rather than any arbitrary rule as to the angle to be included. In connexion with distortion there was one point which was sometimes overlooked. In many wide-angle pictures it was necessary to use the rising front very considerably, so that from the centre of the lens to the top corners of the subject would include an angle very much greater than that from the centre of the lens to the bottom corners of the subject, sometimes as much as two or three times greater. The lens might be raised to such an extent that an angle of 45° would be included from the centre of the lens to the top corner of the picture, while that to the bottom corner would be only 15°, rendering it necessary to employ a lens capable of covering 90°, though only an angle of 60° were utilised. He had seen many photographs that he knew to have been taken under such circumstances, and they looked perfectly natural, although, if such an extremely wide angle—45° from the centre—introduced so much distortion, it should have been apparent. It seemed rather undesirable to fix arbitrary rules with regard to angle of view, because the picture, as a whole, and its effect as a picture, should be the first consideration, especially now that such excellent wide-angle lenses were obtainable.

The Rev. F. C. Lambert thought there was a good deal of truth in Mr. Baugh's remarks upon the subject of the hanging of pictures, to the effect that for a picture to be seen at its best it should be hung in a position bearing a certain relation with regard to the eye of the observer. Painters were agreed upon this point, although they did not carry the theory into practice at the exhibitions of their work. For example, one saw various attempts to represent what was called a downhill effect, an effect which was certainly very difficult to represent adequately, owing in part to the impossibility of getting the picture below the level of the eye so as to correspond with the position of the observer in nature. It was a remarkable physiological fact that the position of the head undoubtedly had an effect upon the appearance of a picture. He once saw a photograph which had been taken looking down into a well. When it was hanging on the wall it looked absurd—no one could even guess what it represented, but when it was placed on the floor and looked down upon—as one would look down a well—it had a strikingly realistic effect. There was no doubt whatever that the position of the head had a wonderful effect in enabling one to realise the altitude or depression of a view. With regard to wide-angle lenses, he agreed with Mr. Debenham that it was undesirable to endeavour to fix upon any particular angle, and that no arbitrary line could be drawn as to what angle was or was not visible. If we were to take the verdict of physiologists who had studied the question, the matter resolved itself to this, that the amount of sharp picture that could be seen with the normal eye, with the head in a fixed position, was about one degree, that being the extent embraced by the middle of the *fovea centralis*, and directly that was passed there was a gradual falling off. The fact alluded to by Mr. Bolas, that one could see lights falling on the periphery of the retina, merely showed that there were nerves in that position and not that the lights were distinctly "seen," in the ordinary sense of the word. The question as to how far one could see right and left was very interesting, but he thought that, like many other points in photography, it was a matter of compromise. Pictures could not be hung in strict accordance with any theory, but it was certainly desirable that, where it was possible, pictures taken with the lens depressed should be hung fairly low down, and that those which represented high-angle views should be hung high on the walls.

The President pointed out that there were three kinds of perspective—spherical, cylindrical, and plane perspective. In each the station point was of extreme moment, and, if it were not for the absence of an indica-

tion of the station point, photographs could always be made to appear correct. With spherical perspective everything would look right from the centre of the sphere; with cylindrical perspective, by standing in the centre at the radius, for, as the eye turned, everything would look correct; but in ordinary plane perspective the cylinder was projected upon a plane called a tangent scale, as was seen in metro-photography. Five or ten degrees of angle of subject near the centre occupied less space than a similar angular measurement near the edge; but, if the eye were at the station point, every point in the picture would subtend the same angle. There was, therefore, theoretically, no objection whatever to an extremely wide angle, provided the perspective was observed from the true station point. With regard to exhibitions, it might, of course, be possible for those who are very particular in the matter to indicate the station point on the back of their pictures. There was no doubt that wide-angle pictures taken by lenses of short focal length were seldom seen agreeably, and, although the effect of enlargement would obviate this to some extent, the correct station point must still be maintained in order to secure accuracy in representation. In certain schools of art the pupils were not allowed to learn perspective, but were told to paint the subject as they saw it, and there was a good deal to be said for this principle. Photographers' work, however, was subject to measurement; they use a lens which is a mathematical drawing instrument, and they must abide by the drawing which it gave. With regard to the measurement of lens apertures, some thirty years ago the general method of finding the working aperture was to use a ferrotyp plate in the manner mentioned by Mr. Baugh, and to cover with milk the anterior surface of the front lens, and measure the illuminated disc. Diaphragm apertures were at one time referred to in a very slip-shod way; the President's late father arranged stops bearing a certain relation one to another. Later, when the question of a unit of intensity was discussed, an aperture of $f\cdot4$ was suggested by the P.S.G.B. Committee as the best, because it corresponded with the aperture of the rapid portrait lens in general use at the time. He thought the time had possibly arrived when an alteration might be made in the Society's standards, which were very little used, for everybody at the present time understood what was meant by $f\cdot1$, $f\cdot2$, $f\cdot6$, $f\cdot32$, &c., but the meaning of any set of numbers would have to be worked out.

Mr. John A. Hodges alluded to the statement that the use of a small aperture tended to produce greater roundness in the picture, and said that he had always been of opinion—and he thought he had proved—that "roundness" depended more upon the lighting of the subject than upon the aperture of the lens. With regard to the use of wide-angle lenses, he agreed that the question should depend upon what the photographer wanted to do with his lens at the time of using it; the subject should be considered from the pictorial point of view, and the photographer, having selected his picture and determined what he wished to include upon the plate, should select the particular lens that would give the desired result. He was referring more especially to landscape work, in which it was sometimes necessary to use a wide-angle lens, and he had no hesitation in saying that it would be very difficult indeed for any one to form an opinion as to the focal length of the lens with which such photographs were taken. He had recently been taking some negatives of the Lynn Valley, a confined situation where the use of a wide-angle lens was absolutely necessary in order to convey an adequate impression of the character of the scenery, and he did not think any arbitrary rule should be laid down such as Mr. Baugh had suggested.

Mr. Baugh, in replying, said he considered that the use of the Abney level, for registering the angle from the horizontal at which a picture was taken, was much simpler and more satisfactory than measuring the extent to which the lens was raised, as suggested by Mr. Debenham. The latter method would involve calculation which was not necessary with the Abney level. For topographical work wide-angle views were necessary and useful, but, from the pictorial point of view, unless they were observed from the right station point they were inaccurate and very ugly. He believed that, as Mr. Bolas had said, a very wide angle could be seen, but only a very small angle could be seen sharply and comfortably. In his opinion it would be much more difficult and less certain to measure the angle on the print by the horizon, as suggested by Mr. Bennett, than to use the level, which was simplicity itself. With regard to composition, wide-angle lenses must certainly be sometimes used in architectural work, but then the print must be observed in the proper way, and the whole object of his paper had been to point out that a photograph could not be seen correctly unless it was viewed from the right point. Of course, no arbitrary rule could be laid down as to the employment of wide-angle lenses, and he had not suggested such a thing. In the Dresden Gallery some pictures were placed in special rooms in such a manner that the majority of the visitors should see them from the proper stand-point, and he advocated the adoption of a similar plan at photographic exhibitions.

ARTIFICIAL DAYLIGHT.

The following is an abstract of a very interesting and suggestive paper, read before the British Association by Messrs. Arthur Dufton and W. M. Gardner:—

It is a matter of common experience that many colours alter in appearance when seen by artificial light. The extent to which colours may vary under different illumination is, perhaps, not commonly known, but is well illustrated by the range of dyed cloths exhibited. Amongst other patterns, one which is green by daylight becomes red-brown by gaslight; a violet changes to purple, a grey to heliotrope, a shade of tan to a brick-red. Particularly striking is a pattern woven from specially dyed yarns, which appears a uniform green colour by daylight, but which is figured by gaslight. Seen by the light of the electric arc, the patterns show similar, but less marked, changes.

It may be of interest to indicate briefly how such peculiar changes of colour arise. The colour of a body depends, in the first place, on the nature of the incident light. In monochromatic red light a red appears much the same as in daylight, but a yellow changes to red, a green is almost black, while blues and violets become red.

Gaslight shows a continuous spectrum from red to violet, but, compared to daylight, is of a strong orange colour, due to an excess of rays in the red, orange, and yellow. It does not, however, necessarily result that all colours appear redder by gaslight. It is, indeed, well known that the majority of colours change little by gaslight. This is due to the adaptability of the eye. If the light becomes redder, the eye becomes less sensitive to red; if the light is deficient in green, the eyes become more sensitive to green. Persons working by gaslight soon cease to notice its intense orange colour. It results that a grey produced by mixture of black and white appears grey under any illumination, and simple colours, such as reds, oranges, and some greens, giving light confined practically to one part of the spectrum, undergo little change.

Generally, however, the colour of a body is due to a mixture of light from different parts of the spectrum. All violet colours are transparent, not only for violet but also for blue and red light; all blues transmit not only blue, violet, and green light, but also more or less red. Consequently, whenever a blue or violet is used in the production of what is called by artists a "tertiary" colour, the general result is a colour having bright bands in different parts of the spectrum. A mixture of red, blue, and yellow, to produce a neutral grey, will show bright bands in the red and green—complementary colours, resulting in a proportion of white light. According to the exact position and intensity of these bands the grey will become redder or greener, or may even remain unchanged by gaslight.

Generally colours become redder under artificial light. This is due not merely to the redder character of artificial lights as compared with daylight, but to the peculiar transparency of colouring matters for red light. Among reds and yellows we have many theoretically perfect colouring matters, a perfect yellow being one having sharp absorption in the violet and blue, and perfect transparency for green, yellow, orange, and red rays. A perfect blue would be transparent for violet, blue, and green, and opaque for the rest of the spectrum. Apparently such a blue can only be obtained by means of cupric salts. All other blue dyes and pigments we have examined agree in being more or less transparent for red light. Even greens transmit some red. This peculiar transparency of colours for red light is of primary importance in colour-matching. All dyers know how persistent is the tendency to the development of red in the production of compound shades.

The need of an artificial light which should so closely resemble daylight as to show colours in their true relationship has long been felt by workers in colour. At present the electric arc light is largely used for colour work, but, as we have seen, it is far from satisfactory.

The peculiar character of daylight is due essentially to the modification produced by the atmosphere in the light from the sun. Light from a north sky as usually adopted for colour work is deficient in red, orange, and yellow rays, and consequently the light from a clear north sky is intensely blue.

Starting with the electric arc light as being nearest daylight in character, the authors attempted to imitate by direct absorption the effect produced by scattering in the atmosphere.

The light of an arc lamp consists of two distinct parts:—(1) The light from the glowing carbons; (2) the light of the arc itself, characterised by its richness in violet rays. In lamps of the enclosed arc type the length of arc is increased, and consequently such lamps give a light richer in violet rays. Although arc lights vary somewhat in the proportion of violet light, they all agree in being richer than daylight in the amount of red, orange, and yellow rays, compared with the amount of green and blue. Owing to the peculiar transparency of colours to red light already

noticed, it is of primary importance that the proportion of red light should be carefully adjusted. Small variations in the amount of violet light are of minor importance, owing to the eye being less sensitive to such rays, and also because in mixing colours there is not the same tendency to develop a band of violet as we have seen occurs in the red, since yellow colours generally have complete absorption in the violet.

The required absorption of the less refrangible rays can be effected by means of blue cupric salts. A solution of copper sulphate shows strong absorption at the extreme red of the spectrum, the absorption extending with diminishing intensity into the green.

For practical purposes the light from the arc is modified by passage through pale blue glass coloured by means of copper. This coloured glass may conveniently take the form of a globe replacing the ordinary globe of the arc light.

THE REGISTRATION OF PHOTOGRAPHS—NOTICE TO OUR READERS.

At the head of our weekly Answers to Correspondents it may very often be noticed that a list is given of photographs registered. There are one or two misconceptions prevalent with regard to this matter which we take this opportunity of removing. In the first place the announcements relate only to photographs which we ourselves have registered for the convenience of our readers. Secondly, they have no reference whatever to or connexion with the official register at Stationers' Hall. Thirdly, they are merely records of registration that we have effected, and they have no legal significance at all, being of the nature of informal receipts only.

It has occurred to us that our readers at large may be usefully reminded that, for their convenience in the matter and especially that of photographers living at a distance from London, our publishers undertake the registration at Stationers' Hall of copyright photographs. For the guidance of those unfamiliar with the necessary procedure, we here state what is required in order to effect registration through THE BRITISH JOURNAL OF PHOTOGRAPHY.

1. Send us two copies of the photograph to be registered, with a postal order for one shilling and sevenpence.
2. On receipt of these our publishers will forward the photographer a registration form, which he must fill up and return to them.
3. Address all communications on the subject to Messrs. Henry Greenwood & Co., 24 Wellington-street, Strand, London. The fee of one shilling and sevenpence covers the cost of registration (1s.), form (1d.), postage and expenses.

THE "BRITISH JOURNAL" DEPOSIT SYSTEM.

It has been our custom for many years past to act as intermediaries between advertisers of photographic apparatus, &c., in the miscellaneous columns of our outer pages, and would-be purchasers of those goods. The latter deposit with us cheques to value, and if a sale is effected the money is forwarded to the vendor, or, in the event of a non-sale, it is returned to the sender. The conveniences of this system are obvious. Advertisers desirous of disposing of goods can send them on approval to inquirers in the assurance that the latter are acting *bonâ fide* in the matter; while, on the other hand, the would-be purchaser need not part with his money until he is satisfied with his bargain.

We draw attention to the fact that we undertake to act as depositories in these transactions by way of replying to many inquiries that have recently reached us on the subject. Numbers of readers and advertisers appear to be under the impression that we do not hold money on deposit. Besides, cases have been brought to our notice in which goods and money have been parted with, to the subsequent dissatisfaction of those concerned.

We therefore wish it to be known that, for the convenience of those who utilise our miscellaneous advertisement columns for the disposal or purchase of photographic apparatus, we undertake to hold sums of money on deposit. The following simple rules must be observed:—

1. A would-be purchaser must send us a cheque, P.O.O., or P.O. to the value of the amount asked by the advertiser, plus one shilling, our charge for expenses.
2. We will advise the vendor of the receipt of the money.
3. On notification from the would-be purchaser that he approves of his bargain, we will forward the money to the vendor. In the contrary event, the money will be returned, so soon as we are advised that the vendor has received his goods back.
4. It must be distinctly understood that our participation in the transactions is limited to the receipt and despatch of deposits.
5. All communications relating to THE BRITISH JOURNAL deposit system must be addressed, and all cheques, P.O.O.'s, and P.O.'s must be made payable, to Henry Greenwood & Co., 24, Wellington-street, Strand, London.

THE ECONOMY OF PHOTOGRAPHIC LABOUR.

COMMERCIAL photography being a manufacturing business in which the raw material is converted into finished articles ready for sale, a large part of its working outlay must go to skilled labour, wages thus forming the main expense in the cost price of photographs. To be successful as a professional photographer, it is therefore necessary to understand the economy of labour, in order to employ it to the best advantage, and to put it to the most profitable uses. True as this is, it is still a fact that few photographers really grasp the labour question, and, as a consequence, the majority of businesses neither yield the highest possible profit to their owners nor the maximum wage to the assistants. The employer still treats his assistant as a servant, a chattel, expecting from him a number of personal services unrelated to his work. In contrast with this, the modern factory-owner regards his worker as a wheel in a machine, doing the allotted part, and no more nor less, personal services under this system having no economic value to the employer, but rather lessening than adding to the worth of an *employé*. By retaining the notion of the assistant as a servant, the photographer refuses to avail himself of those improvements which, during the present century, have so largely increased the productiveness of labour, placing the manufacture of commodities upon a firm economic foundation.

The photographer, again, still carries on his business on the lines of a cottage industry, which is inferior to that known as the factory system. Under the former the workers were isolated, manufacturing their articles from start to finish unaided by machinery; with the latter, the workers are concentrated in large buildings, the principle of the subdivision of labour is strictly carried out, and the newest and most complex machinery utilised. The advocates of the factory system, while quick to grasp the value of the subdivision of labour, the concentration of the workers, and the worth of good appliances, overlooked the health and well-being of those in their employ as a factor in the economy of labour. Including this last, the economics of labour fall into the following leading sections:—

- (a.) The subdivision of labour.
- (b.) The organization of the workers.
- (c.) The economy of tools and appliances.
- (d) The well-being of *employés*.

In the rudimentary stage of manufacture the mechanic undertakes to commence and finish an article throughout; hence, in the early days of photography, the production of plates, sensitive papers, &c., in addition to the making of portraits, was carried on by the individual worker. As any industry progresses, this primitive method of production becomes unsuited to the demands of the case, and the business is subdivided into various sections. A special class arises, who deal first with the raw material, and we have the plate-maker and the producer of sensitive papers; after these, many skilled men as operators, retouchers, enlargers, and printers, each making a speciality of operations previously done by the single worker. The foremost advantage of this subdivision is that the man who confines his attention to a single operation becomes, by habitude and practice, so expert, highly skilled, and adept that his daily output is largely increased. Practically, there is no limit to this process; and, the greater extent to which it can be carried, the more productive does labour become. In photography the subdivision has not yet been taken far, though a few of the larger firms have gone a considerable length in this direction. For instance, in one case the printing is thus split up: paper-cutter, printer plain, printer vignettes, boy to fill up printing frames, boy to carry them in and out of printing-room, washer before toning, toner, fixer and washer after toning, mounter, spotter, burnisher. Here we find eleven separate assistants confined to a single duty throughout the day, and engaged in operations usually conducted by an unaided printer.

By this simple device an undoubted economy follows, the amount of completed work being larger, and more expeditiously produced than if eleven printers were individually occupied with the whole course of printing operations. Beyond this gain arising solely from the expertness of the specialist, a further economy results where each worker continues daily in a similar task, for the time lost by the worker doing various consecutive processes, in passing from one to the other, or in changing from one set of tools or appliances to another, is saved under a subdivision of labour. It follows for these reasons that a multiplicity of duties, or a multiplicity of processes, conducted by the same man is economically not so advantageous as confining his attention to one process or a simple range of duties. This principle is one of the soundest of modern economics, and from its importance it would not be without profit to examine it more closely, and to find how far photographic manufacture is guided in agreement with its demands.

In so far as a subdivision of labour has been adapted to photography, apart from the manufacture of material where labour is much more specialised, we have only to consider, for the majority of workshops and studios, operator, retoucher, and printer. The average photographic business being comparatively small, it is scarcely possible to divide the assistants into more sections, except in a few instances of big firms where we have out and indoor operators, developers, retouchers, black-and-white workers, carbon, platinum, and silver printers, mounters, and spotters, each distinct. This being so, it will be preferable to consider the

larger class of employer, merely noting that a wider subdivision is possible, and in all cases desirable when the extent of business allows.

Coming at once to the question of multiplicity of duties, the following summary indicates without exaggeration what is expected from operator, retoucher, and printer, respectively, in the general photographic house of trade:—

The operator uses several brands of plates with various developers—isochromatic and backed plates, often wet-collodion plates for making enlarged negatives, bromide papers, bromide opals, lantern plates. He must also be competent in studio work, copying pictures, landscape, groups, interiors, and machinery. In addition he is supposed to be able to retouch, to do black-and-white work, and to supervise the retouching, printing, and finishing of the establishment.

The retoucher, besides working on negatives with the pencil, must also be an expert with the brush, and colour on platinotypes, carbons in several colours, chiefly red chalk, sepia, and brown; carbons on opal and ivory; bromide paper and opals in crayons; and, if called upon, be ready to spot and sometimes colour, albumen and gelatino-chloride prints.

The printer should possess a practical knowledge of the following: Albumen, collodio-chloride, gelatino-chloride, carbon, single and double transfer on opal and ivory, carbon negatives and transparencies, platinum, sepia platinum, collodio-chloride platinum toned. In some cases he must know bromide papers and the other methods of making prints by development.

From the above summary, which is drawn from actual observation, it is manifest that the use of a multiplicity of processes is carried to the extreme in present-day photography, and that operator, retoucher, and printer are occupied in a diversity of manipulations involving considerable waste of time in passing from one process to another.

To examine this more closely, take the case of the printer. It is no uncommon thing for him to undertake daily five distinct processes single-handed, or with only a lad to help, namely, albumen, P.O.P., collodio-chloride, platinum, and carbon. This implies five distinct papers, each kept in its wrapper, each to be undone every time it is wanted, rewrapped, and put away again when the printing frames are filled, platinum and carbon paper in light-tight and air-tight tubes. At the lowest estimate ten chemicals are needed—gold chloride, acetate soda, sulphocyanide of potassium, hyposulphite soda, sodium chloride, oxalate potash, hydrochloric acid, carbonate soda, bichromate potash, alum—each requiring to be weighed, mixed, and kept in measured solutions and baths ready for use. To manage all these processes, twelve dishes, including expensive enamelled iron and porcelain, are a necessity, and fifteen, or three for each, would not be excessive for clean manipulation.

Such being the material, chemicals, and appliances that pass through the hands of a printer, it is evident that a large proportion of his working hours is lost in the mere preparation for printing, changing from one paper to another, and in moving the many solutions, papers, chemicals, &c., under his care from place to place. Thus handicapped, the daily output of finished prints, even with the most energetic printers, must be considerably reduced, and cannot be sufficient in quantity to balance the waste of time lost in doing unproductive labour. The same holds good of the output of operator and retoucher, because the value of their services can only be judged by output, and not by the length of the hours occupied.

Beyond the loss through the time that is unproductive i.e., when the employé is preparing, or changing from one set of duties to another, we must also consider that caused by the deterioration of chemicals, and stock, breakages, wear of appliances, and waste of material, all these being proportionately greater, the larger the number of chemicals employed, the appliances handled, and processes in use.

From this short review of the conditions of photographic manufacture it must be obvious that the present-day photographer is utilising his labour in a manner opposed to the first principles of sound economics, and the wonder is, conducted on these lines, that commercial photography pays even its working expenses. To carry on a multiplicity of processes with a limited staff, is inconsistent with the profitable conduct of industry, and those who can recall the paying days of trade will know that it was a period of one process, namely, albumen printing. This allowed the worker to reach a very high point of efficiency, and consequently the employer received good value in return for the wages paid. Nowadays, in striving to work all processes, the employer cannot possibly engage efficient labour, and wages being so high a proportion in cost of production a business soon feels the effects of such bad economy.

With the remaining three heads, the organization of labour, economy of apparatus, and the health of workers, space will not allow me to deal with in the present article, and they must stand over.

JOHN A. RANDALL.

THE DENAYROUZE LAMP.

[Patent No. 22,098 of 1899.]

MANY inquiries having been addressed to us with reference to this lamp, we subjoin the description given in the Patent Specification of M. Denayrouze:—

"Minute observation of the phenomena have enabled me to introduce a

very important simplification in the construction and operation of my previous patented lamps.

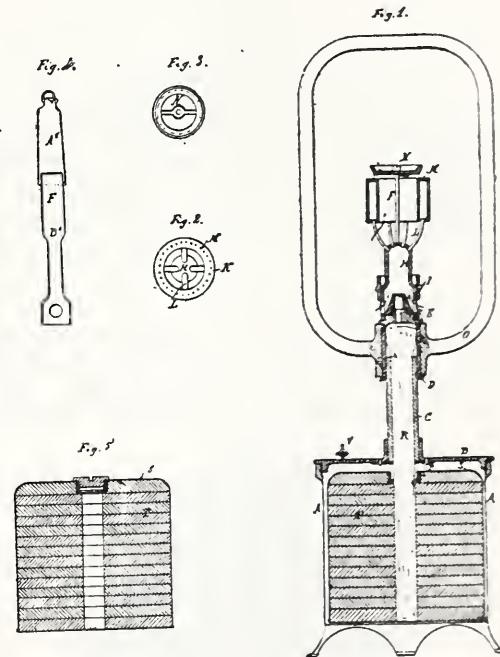
"The following is that in which the new system that I have devised consists. The waste heat of a flame is much more than is necessary to gasify the small quantity of hydrocarbon required to sustain the production of the light (whether with incandescence of rare earths or with incandescence of the carbon itself). In my former lamps and similar apparatus the excess of this heat, collected without means of quite completely regulating the action, rendered the apparatus delicate, and injured their lasting qualities as well as the absolute certainty of their action.

"In the arrangement that I am about to describe I have quite tamed, so to speak, the action of these waste heats:—

"1st. By taking only the quantity necessary and sufficient for the regular feed of the lamp:—

"2nd. By directing the action of this heat and concentrating it on the only part of the apparatus where it may have a useful and even decisive effect, without allowing it to gain the parts of the lamp where its action might in time become injurious and even dangerous.

"The annexed drawing represents my system in sectional elevation (fig. 1). The liquid hydrocarbon (preferably chosen among the most homogeneous products of distillation of tar) is contained in a reservoir *s*, furnished internally with felt *t* or spongy layers of any kind. Into this reservoir, which is itself enclosed in the body *A* of the lamp, under the



cover *b*, penetrates a wick *r* supported by a stiff cross pin *p*. The wick is of cotton or other material favourable to ascent of the liquid by capillary action.

"Above the reservoir *a* *b* lodged in a support is a hollow cylinder *c* of porcelain or other non-conducting material. This piece of insulating material carries on the other hand the metal gasifying chamber *d* closed by a stopper *e*. It may be readily understood that the waste heat of the flame partly collected and conducted by the frame *o* is felt at the chamber *d*, but cannot lose and extend itself lower, owing to the insulation effected by the cylinder *c*.

"In obedience to the capillary action, the hydrocarbon ascends by the wick *r*. In *d* it receives the action of the heat and rapidly emits vapours, this heat being concentrated on the very points where it can be useful, that is to say, where the liquid is rapidly gasified. Thus the heat is not lost on the mass of the lamp body. It acts with perfect regularity and regulates itself with a precision quite mathematical, since its passage can be regulated with the most extreme precision by determining exactly the diameter of the conducting piece which surrounds the burner. Thus there is brought to the gasifying chamber the supply of heat exactly necessary to make the hydrocarbon emit the quantity of vapour which, mixed with air ascending the passage *f*, burns at *m* (see plan, fig. 2) at the top of the burner *h* *l* *k* whence escape the separate elementary flames in burning white without mantle under a deflector *n* shown separately in fig. 3. This burner is provided with a regulating sleeve *i* for admission of air. *i* could cause the mixture to burn under a mantle *A*¹ with a burner *B*¹ (fig. 4).

"The capillary action supplies the wick with liquid, the heat supplies the burner with vapour, all in quantity and at pressure which can be regulated with the greatest precision.

"Thus, whether the burner *a* *b* or the burner *A*¹ *B*¹ be put on, incandescence can be produced with this lamp with or without a mantle of rare earths.

"Extinction is simply effected by opening the cock v, allowing the vapour to escape instead of passing to the flame. This arrangement secures simplicity and economy. The use of the reservoir s which can be replaced (shown separately in fig. 5) gives absolute security. The choice of the volatile substance gives the brilliancy and purity of the light."

Our Editorial Table.

MOTTO MOUNTS FOR CHRISTMAS AND NEW-YEAR'S CARDS.

Sold by W. Tylar, 41, High-street, Aston, Birmingham.

MR. TYLAR is utilising an idea which should be popular with those persons who exchange photographic Christmas and New-year's Cards with their friends. He is issuing a series of embossed folding mounts plain and tinted, and varied in design, a clear space of $2\frac{3}{4} \times 1\frac{3}{4}$ inches on the front of the first leaf being left for the purpose of bearing the photograph. On page three a motto or sentiment, selected from the works of standard authors, is printed. A box of these little mounts costs one shilling and sixpence.

THE PRIMUS LANTERNIST'S POCKET-BOOK FOR 1900-1901.

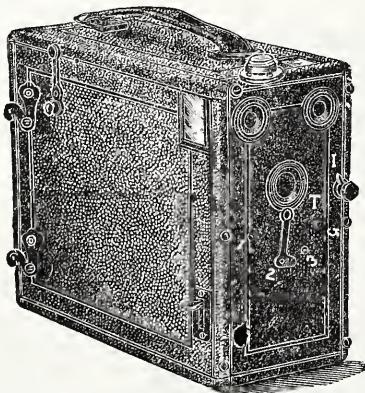
Published by W. Butcher & Son, Blackheath, S.E.

NEATLY bound in green cloth, with diary and memorandum spaces, and containing a great deal of information likely to assist the lantern operator in his work, Messrs. Butcher's Annual Pocket-book, which is edited by Mr. W. F. Butcher, again greets us. The publishers state, that owing to the increased cost of production, they find it is necessary to make a charge of 6d. for the book, and on receipt of this amount they will be pleased to forward it to any applicant *post free*. The Pocket-book is a cheap six-pennyworth.

THE APEK HAND CAMERA.

Sold by Wilfred Emery, 3, Soho-street, and Anson-parade, Cricklewood, N.W.

For the low price of a guinea Mr. Wilfred Emery is putting on the market a form of magazine hand camera which should find many purchasers. It carries twelve plates in sheaths, has an achromatic single



lens, a time and instantaneous ever-set shutter, three stops, two brilliant finders, and a spirit level. The body is covered with leather, and the method of changing, which is by means of a lever at the side of the camera, is simple and reliable. We have carefully examined the instrument, which we can certify to be well worth the money.

Studio Gossip.

MESSRS. LAMBERT WESTON & SON had the honour of a sitting from H.R.H. the Princess Stéphanie of Austria and her husband, Count de Longay, during their recent visit to Folkestone.

THE first illustrated post-card was issued in Basle in 1865. The Swiss, in fact, were the first to hit upon the idea, but it was speedily taken up in Germany, where the trade has assumed gigantic proportions.

DUCKS IN A PHOTOGRAPHIC STUDIO.—At the Haywards Heath Petty Sessions, Mrs. Coles, of Sussex-terrace, Burgess Hill, was summoned at the instance of Edwin Brown, Inspector of Nuisances to the Burgess Hill Urban Council, who asked that an order be made on her to abate a nuisance. The defendant, who was very deaf, sat between the clerk and a solicitor, so that she could hear the evidence. Edwin Brown stated that, in consequence of complaints, he obtained an order from the Justices to inspect the defendant's house. He had great difficulty in obtaining entry. He found the house all right, but in a building built for the purpose of a photographic studio he

found sixteen ducks, which had apparently been there several months. The stench was awful, and the floor quite rotten with manure. The glass roof caused the stench to be greater. The defendant, who was the owner of the house, kept the ducks as a hobby. Mrs. Copeland, of 2, Sussex-terrace, Burgess Hill, said she had complained about the smell. Very often they could not use their garden or their dining-room, owing to the offensive smell that came from the photographic studio. Defendant said Mrs. Copeland had only complained "that the little ducks squeaked, and woke up her little girl." She contended that a false charge had been made, but she would undertake to have the ducks removed. The magistrates made an order for the ducks to be removed within forty-eight hours, and defendant was also ordered to pay the costs, amounting to 1*l.* 18*s.* 6*d.*, or in default seven days. Defendant said she would not pay the money until she had consulted her solicitor.

PHOTOGRAPHING AN ACTRESS.—We abridge from an American contemporary the following entertaining account of an actress's experiences at her photographers'. "We surely manage these things better in London?" "The artist" regarded me with the knowing air of one to whom human nature is an open book, and said I was not very fat, was I? and instantly followed that train of thought by the surmise that I would probably wish to be taken in evening dress. I said that such was my desire, and in an evil moment was moved to add that I wanted the photograph for professional purposes, at which a marked change came over him. He glowed with pleasure, and ordered me to get ready, and we heard him, in the interval, move screens about with the cool and sure precision of one who whets a steady knife for the fray. When we reappeared, he met us with a quiet, masterful smile which seemed to say, 'All is now prepared ;' and, looking me over from head to foot, he at once fell to. Our intimation to him of the ultimate end of the picture seemed to call into being every wily art of which he was master ; but his method of procedure seemed to us, I must confess, a strange one! I was led to a large chair and ordered to go through a series of facial gymnastics, somewhat after this wise :—'Chin back a little, eyes to the stove pipe, a slight forward movement of the body and a blank expression, please' (heroic wriggles on my part, attended by failure alone, judging from the stern front of the photographer), 'a little more attention to detail and you will get the pose ; now, I should like you to replace the blank expression with a cheerful smile ; no teeth in the smile, please. Ah, if the body shakes I cannot effect a picture in any case ! Now, I should like a more conventional smile, merging less broadly to a laugh ; as, for instance, a smile of recognition to a friend. Yes ; better, but a little strained, perhaps. Now let me see a slight brightening of the left eye—a little more sparkle, in fact. Ah, now we have it ! a pity to miss that expression—but I shall have to put on the necessary shadows.' The 'necessary shadows' evolved themselves into a series of little dabs laid upon my cheek bones and about my eyes with a thick, moist, black pencil, which seemed to be filled with some sort of stove polish, awful to feel. Thick coats of powder being laid on after this, I felt that I was now 'shadowed,' and that the man had probably done his worst ; but he stood back and surveyed the prospect with dissatisfaction, knit his brows, and was, a moment later, inspired to remove the powder and anoint my nose heavily with oil, which he rubbed on with a free hand. This done, and my discomfort being quite complete, he placed my head in what he called a 'rest,' he tilted my chin toward the ceiling, and the facial gymnastics began again in earnest. I could feel the heavy condiments upon my face, I was dying to see what they looked like, and I knew I was going to sneeze ! The 'rest' gripped my head like a vice. 'Now, I shall need the assistance of Mr. Johnston,' he said ; and there arose from under a shawled canopy, in the corner of the room, the form of a strange young man, hitherto I suppose secreted there, who came promptly and held over my unhappy head a scoop net, evidently intended at one time for fishing. And from all this agony there came at last, my dearest dears, a picture ! A beautiful, etching-like, transparent picture of a round-cheeked maiden fair to see, with large, limpid eyes and a happy look on her face ! As we gaze upon it, I wonder if it can really be that that little stout smile of pure content was made only of vaseline and blackening and powder ? Was really wrung from my tortured features by the admonitions of Smythe, was evolved from these faltering lips even while I cowered before the awful eye of the discerning camera?"

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—At the Technical Meeting on Tuesday, October 2, at eight p.m., at the New Gallery, 121, Regent-street, W., the apparatus on view in the Exhibition will be described.

SOUTHSEA AMATEUR PHOTOGRAPHIC SOCIETY.—Mr. F. J. Mortimer having resigned the secretaryship of this Society, all communications should in future be addressed to Mr. G. Wood, 10, Pelham-road, Southsea ; or Frank O. Field, 40, High-street, Gosport.

SEVERE ON THE PRINTER.—The following notice appears in an American photographic magazine for September : We beg to apologise for the abominable work of our printer as shown in this month's issue. This is especially noticeable in the half-tones, which are mere blotches, although made from good plates. We promise you it will not occur again.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—To-night there will be a demonstration of the Carbona paper by Mr. Nightingale, of Messrs. Griffin & Son. Next Thursday, October 4, a lantern lecture by Mr. Alexander Henderson on "Bordighera." Visitors are always welcome at the White Swan, Tudor-street, E.C., the meeting commencing at eight p.m.

HELLIS' ROWING CLUB (PHOTOGRAPHERS).—This Club decided their annual pair-cared race on Saturday last, from Millwall Pier to Greenwich. It resulted as follows : G. Brown (bow), O. Oxford (stroke), F. Archard (cox).

1st ; R. Day (bow), G. Horrex (stroke), W. Soper (cox.), 2nd ; H. Peck (bow), E. Freak (stroke), A. Campbell (cox.), 3rd. T. Cleaveland (bow), S. Shakespeare (stroke), S. Hayward (cox.), the winners who led from the start, won by three lengths, second and third being divided by scarcely a length. Starter and Umpire, J. Williams. Judges, Mr. F. Milner and Mr. S. Lydford. In the evening all the members assembled at their Headquarters, Guildford Arms, Guildford-road, Greenwich, where a most pleasant and enjoyable smoking concert was held, after which the prizes were distributed. The meeting was brought to a close by a hearty vote of thanks to Mr. W. Hellis, Mr. W. Morgan, and Mr. F. Milner for their generous support.

MORE DISAPPEARING LONDON.—One more well-known building in the City will soon be a thing of the past. The scholars of Christ's Hospital—the Blue Coat School—in Newgate-street, will shortly be removed to the new school at Horsham. Already some portions of the more historic parts of the building are being taken down—for example, the picturesque old façade on the southern entrance in Christ Church-passage. The parts of this fabric are being carefully packed up, and will be re-erected at Horsham, but they are lost to the City for ever. The main building will not be ready for disposal for some time yet, therefore photographers still have ample time for securing mementoes of the building in which thousands of the citizens, many of whom afterwards rose to fame, received their education. Christ's Hospital, like Newgate and the Old Bailey, has no marked architectural features, but photographs of all of them will be valuable in future generations. As we have often said before, the securing of photographs of historic buildings is too often delayed until they are in the hands of the "housebreaker," and surrounded by boardings, scaffolding, and the like, which make a good picture impossible.

THE CARELESS USE OF AMMONIA.—How many serious consequences have resulted from the careless use of ammonia, the *Todmorden News* states, it would be difficult to calculate. "In the first six months of this year many cases of poisoning, and the majority fatal, were recorded. In the year 1898, eleven persons died from the same cause. One of the chief sources of the mischief arises from the unsuitability of the vessel in which it is kept. Any kind of bottle appears to be good enough to put it in. Ginger-beer bottles are most commonly used, and times and times again these have been the sole cause of people being poisoned. The latest case reported is that of a mother who placed a bottle of this description containing ammonia on the mantelpiece, after using a portion for cleaning the bedroom floor; one of the children came in and drank of the liquid, resulting in death. Perhaps it may not have struck people who use these bottles that they are committing an act of dishonesty. Such bottles do not belong to them, but to the maker of the ginger beer, &c., and by using them they are robbing the owners of their property. Chemists and other sellers of ammonia might do a good deal to do away with the use of such bottles by refusing to put the liquid into them; but, unless there is combined action, the man who scrupulously refuses to supply ammonia in 'pop' and other like bottles, suffers, because the would-be purchaser rushes off to the more unscrupulous dealer."

THE ACTION OF WATER UPON GLASS.—*The Journal of Applied Microscopy* quotes from the experiences of an observer in India, who states that lenses of optical instruments are liable to serious injury from atmospheric influences. Attention was directed to this phenomenon by the observation that domestic glassware, when allowed to stand for some time containing pure water, was more or less dissolved and eaten into. It was afterwards noticed that the glass discs of a Newton's Rings apparatus were attacked and spoiled by the same action. In another case the inner surface of the convex lens in the object combination of a three-and-a-half-inch telescope was badly corroded. From the last case it would appear that some kinds of glass are more readily attacked than others, for the flint glass of the other lens of the combination was apparently uninjured. The writer entertains no doubt that the corrosion in the cases cited above was due to moisture which collected between the glass surfaces. These observations, adds our contemporary, may be of use to optical-instrument makers, especially as it appears that only particular kinds of glass are attacked in this way; for it may be possible to avoid glass of that composition, or the edges of combined lenses may be covered with a coating of cement or varnish, so as to prevent moisture getting in between them. This action is well known, at least, to American instrument-makers, who avoid the use of glass that is subject to injury by atmospheric changes.

THE syllabus of the Leeds Photographic Society has now been issued to the members for the various meetings to be held during the session 1900-1901. Commencing on September 25, Mr. E. W. Culliss opened the season with "Cave-hunting in Yorkshire," and at the following meeting Mr. John H. Gash, a well-known north country worker, is down for "Carbon Printing with Control in Development," a subject which he is more than capable of treating exhaustively. Next on the list is Mr. J. W. Wade, with "An Alpine Borderland," and succeeding him Mr. H. C. Sorby, LL.D., F.R.S., will lecture on "Photographs of Marine Animals." Subsequently, Mr. Percy Sheard is down with "Cairo to the First Cataract," and later Mr. Percy Lund (Editor of the *Practical Photographer*) talks about "Nature Poets and Nature Pictures," and at the end of the year Mr. Godfrey Bingley will give an exhibition of new lantern slides, "Shakespeare's Country, Northumberland, Yorkshire," &c. The new year opens with the Annual General Meeting on January 9, and a fortnight later a *conversazione* and exhibition of members' work will be held. Mr. Horsley Hinton follows with an illustrated lecture on "Some Every-day Aspects of Pictorial Photography," and in turn Mr. Tempest Anderson, M.D., B.Sc., F.G.S., will give an illustrated account of "The Grand Cañon of the Colorado." The Annual Lantern Exhibition is to be held on March 12 next, and on April 12 there is also a show of the Yorkshire Photographic Union's lantern slides, and on April 23 a "Demonstration of Dry-plate Development," which gives place to "A Few Manx Photographs," by Mr. J. W. Addyman, B.A., and the concluding lecture of the session is down to Mr. Charles B. Howdill, A.R.I.B.A., with "The Photography of Colour." The list is an exceptionally strong one, extending well into another year, and much good work will, no doubt, be done, as the Society is the fortunate possessor of a lecture-hall which few photographic clubs can lay claim to. We wish them a very prosperous session.

Commercial Intelligence.

WASTE GLASS.—It is stated that a recent discovery is likely to solve a serious problem for the plate-glass manufacturers of St. Helens. The problem is that of how to dispose of the rapidly increasing waste heaps, and the solution is that of using the waste for bricks. At Messrs. Pilkington Bros., Ltd., there is a waste heap containing a million and a half tons of spent sand, which is being added to at the rate of 1200 tons weekly. These heaps are neither pretty nor useful; in fact, they have been looked upon as ugly, but inevitable accompaniments of an enormous industry. For years chemists and scientists have been trying to find a use for these waste heaps, but it is only just now that Dr. Ormandy, a St. Helens man, has, it is said, found a practicable means of making serviceable bricks. A plant has been laid down at Messrs. Pilkington's works, and the manufacture of bricks will soon be in full swing. For some time it will only be possible to deal with the weekly accumulation of 1200 tons. This, to be used in the making of bricks, has to be mixed with an equal quantity of other substances. If the whole lot is used, it will represent an output of some 800,000 bricks every seven days. Obviously it will be some time before the million and a half tons will be tackled. The discovery is kept a strict secret, though other firms are making endeavours to find some means of dealing with their own waste. The waste is composed of 97 per cent. of ground glass and spent sand. In the process of grinding the plates, a quarter of each plate is lost, while the friction of the iron runners causes a waste of fifteen tons of iron per week. The problem now is to extract the iron, which otherwise will be lost in the brick-making. Whether bricks can really be made profitably is doubtful, especially considering the falling market and the recent collapse of so many brick-making companies.

Patent News.

THE following applications for Patents were made between September 10 and September 15, 1900:—

EXPOSURE SCALES.—No. 16,075. "Improvements in Exposure Scales for Photographers." Complete specification. R. J. HAGEY.

SHUTTER.—No. 16,137. "A Time and Instantaneous Shutter for Photographic Purposes." H. P. TATTERSALL.

APPARATUS.—No. 16,238. "Improvements in Photographic Apparatus." Communicated by A. V.-C. Mayall. O. SCHÖLZIG.

STANDS.—No. 16,282. "An Improved Apparatus for Supporting Photographic Cameras when in use for taking Photographs." Complete specification. R. W. SHIPWAY.

SHUTTERS.—No. 16,072. "Improvements in Photographic Shutters." Communicated by N. A. Cobb. G. C. MARKS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
1.....	Royal Photographic Society	Exhibition Opens to the Public. Demonstration: Bromides and Bromide Toning. F. Anyon.
2.....	Aintree	Illustrated Lecture: Scenes in South Africa. Union S.S. Company.
2.....	Bootle	Technical Meeting: Description of the Apparatus on View in the Exhibition.
2.....	Royal Photographic Society	Address by the President.—The Carbon Process of Slide-making. L. G. Kough.
3.....	Croydon Camera Club	Demonstration: Thornton Films. Walter D. Welford, F.R.P.S.
3.....	Redhill and District	Special Demonstration for Beginners: Treating of Exposure, Development, Printing, and Toning. Fred Anyon.
4.....	Liverpool Amateur	Lantern Night: Bordighera, New and Old. A. L. Henderson.
4.....	London and Provincial	Orthochromatic Photography. E. Sanger Shepherd, F.R.P.S.
4.....	Woodford	Practical Instruction: Cameras, Hand and Stand. Accessories.
5.....	Borough Polytechnic	Excursion: Dorking and District. Leader, F. Turner.
6.....	Brentford	Excursion: Chislehurst. Leader, G. C. Payne.
6.....	South London	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 20.—Mr. R. Beckett in the chair.

Mr. ARCHER CLARK spoke of the keeping powers of ortol developing solution. Some very old used solution that had become of the colour of stone had been given a month's rest, and decanted off, being then of a sherry colour. He found that an ounce of ortol had developed altogether some two hundred plates, and about a like number of bromide prints. It still worked fairly well.

Mr. A. L. HENDERSON gave a lantern show of his Paris Exhibition pictures. They were all hand-camera photographs, although a few had been time exposures and the camera had been supported on a convenient place for the purpose. Mr. Henderson's zealous use of the camera resulted in a very representative collection of views of the great Exposition. The buildings

housing the exhibits of the various countries were made to form an instructive and comparative series, not, he thought, to the credit of this country. Some of the erections were shown to be very handsome in design and construction, while the general views about the interior and exterior of the Exhibition were something that all present were glad to see upon the screen. Mr. Henderson briefly alluded to some experiments in film-making he had in hand, and to some made twenty years ago in conjunction with the late W. B. Woodbury. He had on the stocks a film which was to be something to be reckoned with in the future, and one that was really non-inflammable. He found that certain films which were said to possess this quality failed to withstand fire.

The Association will shortly hear from Mr. Henderson on the subject of films for photographic use.

North Middlesex Photographic Society.—September 17.—In the absence of Mr. Pither, Mr. J. MACINTOSH delivered his lecture on

LIGHT AND SHADE IN COMPOSITION.

Referring to numerous prints and engravings which were on view, he pointed out how the pictorial effect was obtained by the arrangement of the lights and shades. Speaking of altering the gradations in the negative by shading during printing, &c., in order to correspond with a sky having marked differences in illumination, he said that a scene lit by diffused light was the best to experiment upon, as, if the sun was shining, the shadows were difficult to manage.

FORTHCOMING EXHIBITIONS.

1900.

- Sept. 28-Nov. 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
 - October 1-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
 - , 17-20 Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.
 - November 7-10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
 - , 12-17 Ashton-under-Lyne.
 - , 21-23 Hackney Photographic Society.
 - , 22-24 Hove Camera Club. Hon. Secretary, C. Ber-rington-Stoner, 24, Holland-road, Hove.
- 1901.
- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

DR. SELLE'S PATENTS.

To the Editors.

GENTLEMEN,—Permit me to call attention to the fact that the photo-chromoscopic device patented by Dr. Selle, No. 13,666, 1899 (THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 556), is precisely what I patented in the United States, England, France, and Austria, in 1892. The substitution of paper images for transparencies is not an improvement (quite the reverse), and was suggested many years ago.

Dr. Selle's observations about the production of images in minus colours by inserting single positives in such a device were also anticipated by several publications of my own at different periods. The principle is precisely the same, whether the prints be viewed by transmission or by reflection, and the talk about the latter method being "different," in that it gives images "made up of the complementary tints," is all nonsense. It is most singular, too, that Dr. Selle should class my stereoscopic two-step "Kromskop," having coloured-glass reflectors and folding "Kromograms," with anything belonging to Zinck and Nader [Nacher?].—I am, yours, &c.,

F. E. Ives.
1324, Chestnut-street, Philadelphia, U.S.A., September 11, 1900.

[Mr. Ives's letter is a further proof of the absurdity of the British

Patent Laws which permit successive "inventors" to protect exactly the same ideas. As we have often pointed out, a very large percentage of modern patents are not worth the paper upon which they are printed on this very account. An opportunity of further inquiring into the validity of Dr. Selle's many claims will present itself when the Company that is being formed to exploit his inventions makes its long-delayed appearance. And upon that matter we shall probably have some pertinent observations and comments to offer.—EDS.]

PHOTOGRAPHY IN CAPETOWN.

To the Editors.

GENTLEMEN,—I see in a recent JOURNAL a question asked by E. Thorne with regard to salaries in Capetown. I would be pleased to give him any information if he cares to write me to address as under. There was also a question asked three weeks ago, What chance would two men have travelling the Colony after the war was over doing photographic work? Your advice was, Try it. I have had some considerable experience in both Cape Colony and the Transvaal, and would not think of going out from home upon such a venture. Let them take situations until they look round, as the game is now overdone in the Colony, and a raw Englishman stands very little chance. If you care to look up their query, which is about three weeks old, and give them my address, I, no doubt, could help them.—I am, yours, &c.,

Perkins' Temperance Hotel, Minehead, Somerset.

G. D. FRAZIER.

A COMPLAINT.

To the Editors.

GENTLEMEN,—I would advise operators and retouchers not to send specimens of their work to any address unless the real name of the advertiser is given. I may state that, about two months ago, I answered three advertisements, sending, as requested, specimens of my work, and, although I sent stamped address for the return of the photographs, they have not as yet been returned. I am certain no honest photographer would keep them for such a length of time. They may, however, come in handy for some poor soul.—I am, yours, &c.,

OPERATOR.

[A simple plan for preventing the misuse of specimens is for the author of the photographs to boldly write his name and address across them. Specimen thieves unquestionably abound; but there are two sides to this perennial quarrel. And the side not sufficiently insisted upon is that of the operator whose crass carelessness in not identifying, or properly addressing, his specimens renders it impossible for a photographer to return them.—EDS.]

PHOTOGRAPHIC CHRISTMAS CARDS.

To the Editors.

GENTLEMEN,—Just previous to last Christmas you mentioned I think, under Our Editorial Table what you described as the "Speaight Christmas Card," and you expressed surprise that photographers generally did not go in more for Christmas-card work. Could you kindly give me a description of the "Speaight Christmas Card," or tell me where I can obtain one?

If it belongs to a firm of that name, they, having used it last year, will probably have something fresh this season, and will not mind a struggling brother professional imitating what you mentioned so favourably.—I am, yours, &c.,

C. W. E.

[To the best of our recollection the production referred to was a double card bearing on its front surface a little photograph and having a double-paged inset of paper upon which there was a suitable inscription and spaces for the names of sender and recipient. It is not necessary for our correspondent to copy Messrs. Speaight. We recommend him to ask some such firm as Messrs. Marion, Messrs. Houghton, or Messrs. Fellowfield, for a specimen box of their photographic cards. Of these an enormous variety is available and "C. W. E." can easily select a design to suit himself and his clients.—EDS.]

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—May I offer a few remarks respecting Mr. Hand's letter in your issue of last week. In a properly mounted stereoscopic print the two images of a near object are nearer together than those of a more distant object; therefore we turn our eyes inward more to look at the near object than we do to look at the distant one—a state of things which corresponds to nature. If we turn the view upside down in the stereo-

scope, we do not alter the relative planes of the view, because the separation of the similar images is a fixed quantity; but, if we truly transpose the two views we alter the relative distances. The images of remote objects are nearer together than those of near ones; we turn our eyes in for the distant view, and turn them out for near objects; hence pseudoscopy. The same effect is reached by squinting, an action which practically transposes the views. Now, in a negative, these relative positions are in the condition of a transposed print, consequently we must squint at it in order to transpose the view so that the separation of the specific parts of the view may give the effect of nature. But, whether we squint at a print or negative, or regard them directly, turning the print or negative will cause no alteration in the apparent position of objects. That apparent position, near or far, is absolutely fixed by the relative separation of the corresponding images of various details of the view. Those corresponding parts which are close will remain so, whether the conformed view be looked at directly or through, right or wrong side up. There is no special virtue in a right or left-eye view. Take a positive transparency, put it in the stereoscope wrong side before, the only effect will be to turn the view round, left to right, it will still appear solid. May I add that I often look at my negatives stereoscopically before printing and am able to see prints without a stereoscope. I often amuse myself by looking at a print cross-eyed, in order to obtain pseudoscopic effects, which are sometimes peculiar. I hope I have made it clear that the apparent removal of objects, true or pseudoscopic, is merely a matter of separation of the constituent parts of the views, not a right and left-eye matter.—I am, yours &c., HENRY V. HOPWOOD.
36 Ferncliff-road, Downs Park-road, Hackney, N.E., September 22, 1900.

A NEW LIGHT FOR THE STUDIO.

To the Editors.

GENTLEMEN,—“R. S.” inquires about the cost of our new light for the studio.

Four lights for four hours cost 2d. Four lights are sufficient for every class of studio work.

The material for charging the apparatus can be bought at any Italian warehouseman's for 1s. per gallon. We do not use coal gas in any form whatsoever. The gas is made instantaneously as and when required. A small water motor attached to any ordinary water tap drives the apparatus; or clockwork electric motor, weights and pulleys can be used. When required for private houses, theatres, clubs, hotels, &c., a ball and tube can be used worked by a lad for any length of time altogether, making a very compact and portable apparatus. The cost of the apparatus will not be more than 10l., more likely under. I enclose you another photograph, taken in four seconds with three burners only, on a Barnet medium plate, stop f-11·3.—I am, yours, &c.,

EDW. F. CHAPMAN, Manager.
The Atmospheric Gas Company.

5, New Bond-street, Leeds, September 22, 1900.

To the Editors.

GENTLEMEN,—Replying to “R. S.” I am unable to say what the saturator or carburiser is charged with, as I am not in any way connected with the invention. I suppose the contents of the cylinder are included in the patent; but any information would be supplied by the Atmospheric Gas Company, New Bond-street, Leeds. I believe the light was really brought out as an illuminant, but my attention was directed to its extraordinary actinic power, hence my reason for bringing it before the photographic public.—I am, yours, &c.,

A. A. PEARSON.

21, New Station-street, Leeds.

A SOCIETY FOR PHOTOGRAPHIC ASSISTANTS.

To the Editors.

GENTLEMEN,—As you have hitherto generously allowed your columns to be opened for the discussion of subjects specially of interest to photographic assistants, perhaps you will allow me space to supplement your reply to your correspondent of last week, who is desirous of knowing the name and address, also your opinion, of the organization which photographic assistants can join.

The name of the Union, to give it its full title, is “The National Amalgamated Union of Shop Assistants, Warehousemen, and Clerks,” and the head office is at 55, Chancery-lane, London.

If your correspondent will refer to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899 he will find an article devoted to the above organization and a table of payments and benefits.

Although the above Union was not formed specially for photographic workers it is prepared to, and does, accept their applications for membership; and, until operators and assistants can pluck up enough courage to form a Union of their own, they cannot do better than join, and participate in the benefits offered by this organization, that is if they are so unfortunate as to need them.

As you rightly add in your reply to your correspondent, it is regrettable

that photographic operators and assistants will not combine for mutual help and support, but I think this question of respectability which is alluded to has a lot to do with it. Is the photographic worker any more respectable than the engineer, railway worker, lawyer, or doctor? and all these have long since recognised the benefits of combination. No, sir; if photographic workers desire to alter their condition and protect their interests, they will have to adopt the same methods that have been used so successfully by workers in other trades and professions; and, to judge from your advertisement and Correspondence columns of recent years, there is some room for improvement in the conditions under which many assistants are working. An attempt to form a Union for photographic assistants was made a few years back by Mr. Randall, but failed from lack of support, the photographic worker evidently considering himself too respectable to join a Trades Union. I should like to know if the same feeling exists as strongly now as then. If Mr. Cameron writes to the address as under, he will be informed of the address of the Glasgow Branch Secretary.—I am, yours, &c.,

A PHOTOGRAPHIC TRADES UNIONIST,
15, Cornwall-terrace, Bradford.

COLLOTYPE POST-CARDS.

To the Editors.

GENTLEMEN,—With reference to enclosed page from this week's JOURNAL and to the replies re Collotype printing, we do not think it at all fair treatment on your part towards those advertising, if, where there are several firms equally capable of doing the work your correspondents enquire about, you should mention by name a particular firm or firms at the expense of others.

We have printed millions of pictorial post-cards from our own and our customers' negatives, and we undertake Collotype printing of every description. We accordingly consider we are not acting at all unreasonably in making the above protest against what we think unfair treatment on your part.—We are, yours, &c., WYNDHAM & COMPANY, LIMITED.

Mill Hill Park, Acton, London, W.

September 22, 1900.

[The passage to which our correspondents take exception is as follows: “We presume our correspondent requires collotype prints. If so, Messrs. Morgan & Kidd, Richmond; The London Stereoscopic Company, Cheapside, and other firms who advertise in this JOURNAL and its ALMANAC, execute such work in enormous quantities, and should be able to quote lowest prices consistent with good printing.” Obviously Messrs. Wyndham are included in the “other firms” referred to; but, in order to convince them that we have no desire to act unfairly towards them, we insert their letter, which is, perhaps, needlessly querulous.—EDS.]

DR. BARADUC'S EXPERIMENTS.

To the Editors.

GENTLEMEN,—I do not remember having seen anything with reference to the enclosed in the JOURNAL. A friend of mine is very much interested in the question, and would be obliged if you could give me any information on the subject, or give any further reference.—I am, yours, &c.,

ARTHUR ELSDEN.

The Studio, Mill Bridge, Hertford, September 25, 1900.

“Les docteurs Baraduc, Luys,* et Lebon, ont réussi à fixer sur la plaque sensible les radiations de la pensée et les vibrations de la volonté. Ces expériences nous les avons poursuivies nous-même pendant des années, et le fait qui s'en dégage, c'est qu'il existe en chaque être humain un centre de radiations invisible, un foyer de lumières qui échappent à la vue, mais peuvent impressionner les plaques photographiques.”—LÉON DENIS, *Christianisme et Spiritualisme*, Paris, 1898.

[We fear that we cannot help Mr. Elsden in the matter. Fugitive paragraphs relating to Dr. Baraduc's experiments are all that we remember to have seen, and they give no more information than the above extract; but we insert the letter in the hope that its publication may bring Mr. Elsden the references he desires.—EDS.]

PHOTOGRAPHS REGISTERED:

A. Tear, 5, Westgate-street, Ipswich.—Two photographs of Miss Pretty.

G. A. Dean, 14, High-street, Rugby.—Photograph entitled “In the Stocks.”

A. J. Aslbolt, 29, High-street, Southampton.—Photograph of E. Chadwick.

W. Brown, 9, Gilmour-street, Paisley, N.B.—Photograph of Centenary Memorial to R. Pollok, A.M.

* “Voir la communication du docteur Bardaduc au Congrès de Photographie de Bar, celle du docteur Luys à la Société de Biologie (juin 1897) et l'ouvrage du docteur Baraduc : L'Ame humaine, ses Mouvements, ses Lumières.”

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

VACUUM CAPUT; REX; W. THOMPSON; F. J. MARTIN; IN NUBIBUS; ALPHA.—The answers to these and other correspondents are unavoidably held over.

PHOTO-BUTTONS.—R. B. GILPIN writes: "Could you give me the address of a firm that make those photo-buttons? I have looked all over for an advertisement, but fail to find any. I am thinking of getting some done of our candidates."—In reply: Crayon, Limited, 49B, Brecknock-road, London, N.

PHOTOGRAPHING ON WOOD.—BRUM writes: "I should be extremely obliged if you could give me any one good and cheap method of photographing on wood?"—A process of producing photographs on wood blocks is given on p. 326 of the current volume. That may be the "floating-on process" referred to in your previous communication.

MOUNTING PRINTS ON FLEXIBLE SUPPORTS.—CHAIRS writes: "I have been photographing a lot of chairs for a manufacturer. He wants me to mount the prints on some kind of pliable stuff, such as cloth, to be rolled up and carried by travellers. Can you suggest to me a suitable material?"—We can suggest nothing better than linen, such as folding or pocket maps are mounted upon.

THE R.P.S. EXHIBITION.—ALAN CARTWRIGHT writes: "I should deem it a favour if you would inform me where I can obtain the necessary particulars for sending an exhibit to the Royal Photographic Society's autumnal Exhibition."—In reply: Of the Secretary, 66, Russell-square, London, W.C. If our correspondent applies for a form about next July, he will be in time for the Exhibition of 1901. This year's opens on Monday.

RETOUCHER'S KNIFE.—W. WALKER writes: "Will you kindly tell me where I can get a first-class retoucher's knife. Also say if there is a work published on the use of the knife."—Marion & Co., Soho Square. There is no work published on the use of the knife, beyond what is included in the usual instruction in retouching. We should advise you to get a few lessons from a skilful retoucher, who would initiate you in the use of the knife.

COPYRIGHT.—G. BOUCAS writes: "Can you inform me as to my position as stated below? I was asked to make an enlargement of a photograph marked copyright; may I do so? A customer brought me a photograph taken by an amateur, on a plain mount, and ordered copies and enlargements from the same, which I supplied. The amateur in question wants to stop me; can he do so?"—In reply: Assuming that in both cases cited the original photographs are copyright and have been duly registered at Stationers' Hall, you would be liable to an action for infringement. Photographers, trade enlargers, and others do not realise the very grave risks they run in this matter.

COATING FOR A FIXING TANK; TESTING MOUNTS.—PENTLAND asks for: "1. A formula for coating a box I have cut down for a negative fixing tank; the sides are dovetailed, but the bottom is nailed on and the wood is stained with rust, and the negatives might in turn be stained if fixed in tank as it is. 2. A test or tests for the purity of mounts would also oblige."—1. One of the best coatings is hard paraffin wax, melted and run round the vessel. Another good one is a mixture of bitumen and beeswax. The vessel should be made warm before either is applied. If the coating is made impervious, the nails will not matter. 2. Tests for mounts were given on p. 291 of the current volume.

COMPETITION PHOTOGRAPH.—COMPETE writes: "Kindly excuse the colour of the enclosed print of a country post-office now removed. Please say through the JOURNAL if you think it sufficiently interesting to enter into one of the many magazine and other competitions. If so, kindly recommend size (enlarged?) and mounting, or what you think would show it off at its best."—In reply: The print sent shows a pleasing little photograph of an old thatched cottage, which would look well in toned bromide, sepia platinum, or carbon. But we do not think it up to competition form; at any rate, it could not in the most favourable case bring our correspondent more than a few shillings.

PARTNERSHIP AGREEMENT.—ORION writes: "1. Partnership has been dissolved by the outgoing partner signing over all to me for a fixed sum; should that be stamped or not? 2. The agreement has also been handed over signed by two witnesses, it is not stamped; signed December 25th, 1899; is it too late now to be stamped for my own safety; if not, what is about the cost including late fee, and where should it be sent to? I might say the agreement concerns the studio accessories, apparatus, &c., taken over from the late owner of same."—1. Yes, certainly. 2. It is not too late. The fee will be, we think, ten pounds in addition to the cost of the stamp itself, payable at Somerset House.

ELECTRICAL QUERY.—S. COLEY. Your query should be addressed to one or other of the journals devoted to electrical matters. In this column we cannot undertake to reply to queries that in no way, directly or indirectly, relate to photography.

COVERING POWER OF PORTRAIT LENS.—J. ROBERTS. The lens is a portrait lens of less than twelve inches equivalent focus, therefore you must not expect it to take 10x8 groups, even when stopped down to f-6. Its being three and a half inches diameter has nothing to do with it. The focal length is the factor, and a portrait combination of the focus stated, even when stopped down to f-6, must not be expected to cover a 10x8 plate.

DISCOLOURED PYROGALLIC SOLUTION.—C. WILLEY says: "Hitherto I have used metol as a developer, but it has made my fingers in a very bad state. I have made up some pyro solution ten per cent. by the ordinary formula, but it is of a sherry colour, is it of any good?"—It should not be of that colour if the sulphite was dissolved first and it was of good quality. However, it will, doubtless, work all right, though it may perhaps not keep long; try it.

REMOVING SILVER STAINS FROM LINEN.—G. SHUTER says: "I have got some bad silver stains on some of my cuffs, can you tell me a simple way of getting them out without injuring the fabric?"—Wash the cuffs thoroughly to remove all the starch and dry. Then apply a tolerably strong solution of cyanide of potassium to the stains while they disappear, and then well rinse in water. Of course, you are aware that cyanide of potassium is poison.

CARBON PRINTING TROUBLES.—W. BLAKE says: "Can you help me out of this difficulty with my carbon printing. I get on very well with the single-transfer process. But with the double I fail entirely. My difficulty is this: The picture is developed on the flexible support and dried. Then the double-transfer paper is applied and well squeegeed upon it and again dried. When the two are separated there is as much of the image left upon the flexible support as there is upon the transfer paper?"—The reason, probably, is that you have used too hot water in softening the transfer paper, and so dissolved off the adhesive coating. Use cooler water, or allow a shorter time in the soaking of it.

COPYRIGHT QUESTION.—F. A. V. asks: "If an artist is employed by an architect to paint a fresco for a church, museum, or other public building, and the authorities in charge of such place allow a photographer to make a negative from such fresco without the knowledge and sanction of the architect, or even the artist himself who did the work, has that photographer, if he registers his negatives in the ordinary way, any real claim to copyright in same, the artist being still alive?"—In reply: The artist who painted the fresco would have the copyright in his work, and we surmise the photographer would be infringing it, and would be liable to penalties. But the photographer might have a copyright in his work if he was not infringing any one else's.

A BUSINESS DISPUTE.—H. LESLIE writes: "For the benefit of others in the trade, I wish to inform you that I sent some photographic apparatus five weeks ago to a certain photographer on approval or return. I have written him several times, but can get no reply. By the appearance of his memorandum, I took him to be a respectable tradesman, but by his detaining goods and giving me no reply I am of opinion that his intentions are far from those of an honest man. I know I can sue him, but what I should like to do is to have him arrested for obtaining goods under false pretences. Can I legally do this? I should prefer to take the latter course, as it would be a warning to others like him."—In reply: We do not think you can have the man "arrested," but a solicitor will advise you if a police-court prosecution can be instituted.

YELLOW STAINS ON PRINTS.—NEW BRIGHTON writes: "1. Could you explain the cause of the yellow stain upon the print I enclose, also how to remove the stain? 2. I have been using hydroquinone for some time, but had such difficulty in developing fully my negative, although I gave twice to three times the exposure that others gave, that, on the advice of a friend, I have taken to pyro, the same as recommended for Imperial plates. But this does not satisfy me; I like good contrasts. 3. Can you tell me how to get this, and not such flat prints? 4. Can you tell me why I had to give such a long exposure with hydroquinone as a developer?"—1. Carelessness in the work. The prints have been allowed to stick together while in the fixing bath. There is no way of removing the stains. 2 and 3. There should be no difficulty in getting good contrasts with either developer if the exposure is correct and sufficient time is given for the developer to do its work. 4. No; unless you used very slow plates.

INTENSIFICATION TROUBLES.—INTENSIFIER writes: "I beg to submit a couple of negatives for your inspection. They were, if I remember right, somewhat over-exposed and thin when developed, so I proceeded to intensify with mercury. The following steps were taken: (1) Soaking and alum bath; (2) Washed in running water thirty minutes; (3) Bleached merc. chloride and small quantity of hydrochloric acid; (4) Washing about twenty minutes; (5) Blackened sodium sulphite; (6) Washing. While in the mercury bath they become 'velvety' to the touch, which became worse on transfer to the sulphite, and in the final washing settled down to the reticulated appearance you now see. I tried shrinking by methylated spirit, but with little effect, and, from observations made on No. II, I am inclined to put the effect down to the gelatine going wrong, and casting all its suspended silver, &c., to the surface. Can you suggest any remedy, or tell me what has caused the failure? I cannot find any information in my books of reference."—In reply: Of the many possible causes of the trouble, an excessive quantity of acid seems to us the most likely. We have had films behave in the same manner with acidified mercury solution. Probably the gelatine was from a soft "batch." We can offer no other explanation.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

The ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages for the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their M.S., sketches, &c., at the earliest possible date.

We shall be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c.

As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

† † Will secretaries of societies who have not yet sent us lists of officers for inclusion in the ALMANAC kindly oblige us by doing so at once in order that this section of the book may be proceeded with.

EX CATHEDRA.

By the courtesy of Mr. E. Cecil Hertslet, Her Majesty's Consul at Havre, we have received a copy of the list of the French Exhibition awards conferred upon British and Colonial exhibitors. The work which is under revision is compiled by the Royal Commission from information published by the French Exhibition authorities, and it is printed by William Clowes and Sons, Limited, of London. The list occupies eighty pages of print, and we are very much obliged to Mr. Hertslet for his consideration in the matter. It is curious that an essentially British publication should reach us via Havre, and not direct from South Kensington; but the ways of British Commissions are always difficult to understand. The home authorities who represented Great Britain at Paris do not appear to have considered it their duty to volunteer any information to the Press with regard to the destination of the British awards. By the way, our statement made in the JOURNAL some weeks ago that actual medals were not handed to successful competitors was disbelieved by some persons not familiar with the modern customs attending the distribution of Universal Exhibition awards. We therefore quote from the compilation before us the following pronouncement on the subject:—"The regulations of the French Administration provide that awards to exhibitors shall take the form of diplomas signed

by the Minister of Commerce and by the Commissaire-General." Obviously, therefore, those who have received gold, silver, and bronze "medal" diplomas must have them prepared at their own expense. One of the most curious awards at Paris was that of the Grand Prix for the collective exhibit of Pictorial Photography. Fifty photographers sent work for this section: and we suppose each one is entitled to feel a proportionate share of exultation at his success. What has become of the diploma, and will each of the fifty receive a photographic reproduction of it? It will be interesting to know where the precious document is stored. We suggest that the names of the fifty be written upon it, so that if another International Exhibition takes place at Paris in 1911 the names of those then considered the most prominent in pictorial photography may be compared with the successful exhibitors of 1900.

* * *

THE Edinburgh Photographic Society's winter syllabus and the October number of its transactions have reached us this week. Between the present time and next May this old-established Society—it dates back to 1861, and thus ranks high up amongst veteran photographic institutions—has settled to work through what appears to be an excellent programme of papers and demonstrations. From the Transactions of the Society we take two extracts illustrative of the public-spiritedness which prevails amongst the members. In June last the President proposed that a telegram should be sent to Her Majesty the Queen congratulating her on the entry of her troops into Pretoria. This was agreed to, and the following is the text of the telegram which was sent: "To Her Majesty the Queen, Balmoral. Edinburgh Photographic Society, at its Fortieth Annual Meeting, humbly desire to express to your Majesty their heartiest congratulations on the triumphal entry of your gallant troops into Pretoria," and the following is the reply which was received from Her Majesty: "Buckingham Palace, 9th June, 1900. The Private Secretary is commanded to express the thanks of the Queen for the kind message of congratulation which you have forwarded to Her Majesty." At a later date the death of the Duke of Saxe-Coburg-Gotha (Duke of Edinburgh) was made the occasion of the transmission by the Society of the following letter of condolence to H.R.H. the Duchess of Saxe-Coburg-Gotha:—"May it please your Royal Highness. At a meeting of Committee of this Society, of which your late husband was the Patron, we were deputed to offer in its name our respectful, sincere, and heartfelt sympathy with you in the severe trial with which you have been so lately afflicted. His Royal Highness, the late Duke of Saxe-Coburg-Gotha, with that graciousness for which he was so well known, became the Patron of this Society on 2nd August, 1881, when he was Duke of Edinburgh—just nineteen years ago just now—an office which he held, with much acceptance to the photographers of Edinburgh, until his untimely death. While therefore mourning the loss of our esteemed Patron, will you allow us to offer your Royal Highness our respectful, sincere, and heartfelt sympathy in the great and irreparable loss which has befallen you?" It was but natural that the Edinburgh Photographic Society should lament the loss of its august Patron; but an even more unique interest must attach to the telegrams evoked by the Fall of Pretoria. No other photographic

society, that we are aware of, was moved to indulge in a similar patriotic outburst.

* * *

We have been shown by General Tennant a simple method of attaching a yellow screen-holder to a shutter. The latter is of the familiar Thornton Pickard kind, and it is, of course, well known that its external surface surrounding the aperture outside the lens is plane. Upon this surface a light frame of ebonite has been screwed, and, being grooved at the sides, all that is necessary is for the screen to be dropped into position, where it is securely held. The details of the device, which General Tennant tells us may be generally availed of, can, of course, be varied. The idea so far as we know is quite novel, and it is very easily applied to shutters of the type mentioned. A few shillings should defray the cost of fitting such an attachment, the conveniences of which must be plain to practical workers. Considerable discussion has from time to time taken place with regard to the best position the screen should occupy—in front of the lens, between the combinations or at the position behind the lens. In practice, there is perhaps not much to choose between each of these plans. Until now we have not seen a suggestion that the screen should be placed in front of the shutter, and, of course, with many shutters it is not practicable to give it such a position.

* * *

ONE of our contributors, whose experience of photography has been long and varied, sends us some remarks, condemnatory of dark room lamps, which are worth taking into consideration by those firms who make and sell these "necessary evils." He says: "The lighting of the dark room, the laboratory, and work room, very often, of the amateur and professional alike, remains pretty much as of yore. Particularly is one led to a conclusion of this sort by an inspection of the lamps which are placed upon the market for the purpose of providing safe illumination during the development of plates. I really do not think we can feel proud of the assortment provided for our use, it is a meagre assortment, but on the other hand it is easier to find fault than to suggest improvements—one can only attempt to do the latter. There is not one dark room lamp which comes up to an average well-constructed cycle lamp; the latter is a vastly improved accessory; the former has evidently escaped notice. Now, every cyclist knows that a cheap lamp is abominable and vexatious, and withal the most expensive in the end. The same remark applies, and almost to the same extent, to ruby lamps intended for the illumination of the dark room. The ideal dark room," continues our correspondent, "is one (I write strictly from the amateur point of view) which is practically a room, portable or fixed, fitted up within another room in which there is a fireplace, the window provided with a shutter in order to be able on occasions to totally exclude all daylight; if now, the dark chamber is placed close to the window, and itself provided with a window papered with ruby and canary fabric, and this small window adjusted approximately to an aperture similar in size cut in the shutter aforesaid, we have a splendid light for all purposes when working by the light of day, with this important proviso, however, the ruby and canary media to be renewed at least twice a year, and oftener if exposed much to sunlight. In my own case

I have fitted pieces of pine grooving, sold for negative box making, at the top and bottom of window, and am able to slide squares of coloured fabric, attached to old cut out mounts, across the window, enabling me to block out a great deal of superfluous light, or rather, adjust it to one's own individual requirements.

* * *

"MANY lamps" (he continues) "are little better than small portable stoves, and vile-smelling at that. There is no sense in having anything of the sort inside the developing room at all, providing one has a second window somewhat similarly constructed, at any point within 6 ft. or so of the average gas burner. Sufficient light is available for working by, or to fit up a shelf or bracket outside, upon which may be stood pro tem. whatever illuminant is available. If a lamp must be used inside the developing chamber, I should prefer to use, in the absence of an electric lamp, a good cycle lamp, as a well-constructed and designed affair to be depended upon to give a good light, and not to go out at unexpected and critical moments; but in this case it is best to use with it a couple of folds of ruby and canary fabric, at least two feet in length, stood up on one end round the lamp; any fumes arising from bad combustion are thus carried up above the level of one's nose, at any rate. Purity of atmosphere in the dark room is just as important as anywhere else. It is, I believe, a factor in the development of the very sensitive plates now so frequently used almost to the extent we assign to the purity of our chemicals and the cleanliness of our utensils. This purity of atmosphere is, if the sale of lamps be any criterion, not attained by the majority of photographic workers." It must surprise the manufacturers to be told that for dark room purposes an experienced photographer prefers to use a cycle lamp instead of one specially made for the purpose; and if it be true, as he asserts, that while the former has been improved the latter has escaped notice the sooner it is taken in hand the better. From our own experience with a large variety of gas, oil, and candle-lamps, we can quite sympathise with much that our correspondent says.

EFFECTUAL WASHING.

IN two previous articles we have dealt with the subject of the fixation of silver prints, as relating to their stability. When dealing with the subject we pointed out that unless the prints were perfectly fixed in the first instance, so that the complex hypo-silver salts were got into a perfectly soluble condition, no after washing would eliminate them, however long that might be. Now, it is these salts, if left in the picture, that do the chief mischief; a mere trace of hypo-sulphite of soda is comparatively harmless, as experiments made many years ago have shown. At one time, now many years ago, long washing was thought to be necessary to eliminate the hypo, and it was customary, with many, to leave the prints in running water all night, so that they received fourteen or fifteen hours' washing. In some cases they were left in from the Saturday night till the Monday morning. This prolonged washing was, of course, quite unnecessary. But as the prints then made were of a very robust character, they suffered no harm, and, therefore, conscientious photographers preferred to err

on the side of overdoing it rather than underdoing it. Present-day pictures would be materially deteriorated in appearance by anything like that treatment, and it would be of no real advantage if they would not be injured.

Some time ago Messrs. Haddon and Grundy demonstrated that the hypo-salts could be entirely got rid of by washing for an hour or so, if the work were properly done. Since then a reaction has set in, and, in many cases, the washing, as a result, is incomplete; not, however, that the time has been too short, but because the method followed has been not what was required. The directions issued by the makers of some papers encourage too little washing to ensure stability—that is in the conditions it is usually done. Some of these directions say wash for half-an-hour in running water, others an hour or an hour-and-a-half. Now, many inexperienced amateurs simply rely upon these instructions, and put the dish, or maybe a washing machine, containing perhaps two or three dozen prints, under the tap, and let it dribble for the stated time, and then assume that the pictures will be permanent!

At the present time there are three different kinds of paper in vogue—albumen, collodion, and gelatine. Now, the films bearing the images, in each case, are of a different character. The albumen one is thin, and the albumen is insoluble and has very little affinity for water. The collodion film is still thinner, and has no affinity whatever for water. Gelatine, on the other hand, has a great affinity for water, and holds it tenaciously, and this film on the paper is also thicker than it is on either of the other papers. Let us for the moment take the two latter—collodion and gelatine—as applied to glass, by way of illustration. Collodion negatives are mostly fixed with cyanide of potassium, and, with that, a minute or two under the tap is ample to render the negative permanent. Many, however, are fixed with hypo-sulphite of soda, but, even with that, four or five minutes, or less, is quite sufficient to get rid of all traces of the salts. Not so with gelatine negatives, as with them, as everyone knows, a much longer time is necessary to ensure the elimination of the hypo-salts, even when the negative has been thoroughly fixed. Here we are dealing with the film on an impervious and non-absorbent material—glass.

In the case of prints, there is not only the film, but the paper, an absorbent material both of water and the solution of the hypo-silver salts, to be taken into consideration. These have not only to be eliminated from the films on the paper, but from the baryta coating, with which most of the "P.O.P.'s" are surfaced, as well as from the sizing material by which it is held to the paper. Now, can it be expected that the brief time, sometimes recommended, will effect this, in the conditions the washing is too often done?

In washing a precipitate a chemist is very careful to drain off, as dry as possible, all the water he can before adding fresh, for the washing is simply a matter of dilution. For example, say to begin with, there are forty ounces of solution to be eliminated, and the precipitate is drained off to one ounce. When the vessel is filled up again the water contains but a fortieth part of what it did before, and when the precipitate is again drained off to an ounce, and the vessel is once more filled up, the water contains but a fortieth part of what the previous lot did, and so on with each subsequent change, until the precipitate is thoroughly

washed. In the days when albumen paper was the only one used, prints, as now, sometimes had to be produced in a great hurry, and old photographers have told us that some of the most permanent ones they have made were washed in from ten minutes to a quarter-of-an-hour. The washing was done in this way:—After the prints were thoroughly fixed they were blotted off as closely as possible; they were then put into water and kept in motion for a minute or two, until it had thoroughly permeated the paper. The prints were then closely blotted off as before. Then they were put into water again, or washed under the tap for a few minutes, and once more blotted off, these operations being repeated till it was judged that all hypo had been removed. Here it will be seen that the principle of washing a precipitate was closely followed.

Of course the blotting-off method, even in a case of emergency, could not be adopted with gelatine papers, though it could with collodion ones. Much the same end may, however, be attained with gelatine papers by taking the prints from the water, placing them on a glass plate, and then passing over the back a soft roller squeegee with heavy pressure. We have merely quoted the above to illustrate how prints can be effectually washed in a very short time—and the same principle can be followed in every-day work in this way.

After the prints are fixed let the hypo solution be poured off, and the prints thoroughly drained while adhering to the bottom of the dish. They may then be put into a larger dish, or tray, and that filled up with water, and kept in motion for a few minutes, and the water closely drained off as before; these operations being repeated every five or six minutes. In this way, with a dozen or so changes of water, according to the number of prints and the size of the vessel, the pictures may be considered effectually washed in an hour or so. If the tap be running while the prints are in the water, so much the better. The object in the effectual washing of prints should be to get rid of as much as possible of the previous water before putting them into the next. Continual changes of water, with close draining between each, is far better than any continuous washing contrivances, however convenient they may be.

Micro-photographic Despatches.—According to a paragraph that has been going the round of the papers, the reputation of Dagron and his balloon system of pigeon-post messages is to be overshadowed by the most recent invention in connexion with minute photographic despatches, for, on the above authority, we learn that a "Western farmer" is training bees in lieu of pigeons. The bee is taken away from his little hive, a letter, photographed à la Dagron gummed to his back; he is turned out just like a pigeon, and home he goes! But if, as we were informed in the days of our childhood, the little busy bee gathers honey all the day from every opening flower, we think he would find even his tiny film a big load to carry, and it would be very awkward if he deposited his satchel of news in the middle of some tempting honey-laden bell. When the system has been completely matured, there will be a fertile source of copy for special correspondents, and in time we may expect to read such correspondents' stories as "The Brave Bee. Successful Encounter with a would-be Commandeerer. Sting against Bayonet: the Enemy Routed. Triumphant Return of the Insect."

Invisible Light Photographs.—From photographs by Venus-light to photographs taken by invisible lamp light is a slight step, and the latter feat has been achieved by M. Gustav Le Bon, whose

name has for some time past been familiar from his experiments with what he first, we believe, termed "dark light" or "black light." In a late number of the *Revue Scientifique*, this discoverer describes a remarkable and interesting phase of light, of which, if not already tried, there is no doubt that photographic use will be made. M. Le Bon, writing on various forms of phosphorescence, describes a dark lamp (*lampe noir*) for producing invisible radiations of great wavelength in connexion with the study of phosphorescence. After describing a number of experiments, he refers to the one we speak of. In an absolutely dark room, a dark lamp is placed on a table, this lamp not transmitting any trace of visible light. In front of it M. Le Bon places a statuette covered with sulphide of lime that has been left in darkness for several days, and consequently retains no trace of phosphorescence. After about a couple of minutes the statuette becomes luminous, and appears to emerge from the darkness. It is evident that the statuette in its luminous condition might be photographed, and some pretty and curious photographic experiments performed under the given conditions.

Healthy Atmospheres.—Since the advent of dry-plate work the old complaints of unhealthy dark rooms is never heard. The odours of the wet-plate era were strong and evident, but the question arises, Are there not to the dark-room worker emanations and impurities of the air of the room all the more dangerous through not being readily evident to the nasal organs? Some reply to this question may be found in the results of an investigation which, according to the *Manchester Guardian*, Mr. Francis Jones, of the Grammar School of that city, has been making. Briefly, his conclusions are that, if pure air is desired, gas should be avoided, either for heating or lighting. Thirteen parts of carbonic acid per 10,000 is quoted as being the recognised permissible maximum of this impurity. Coal fire and gas in Mr. Jones's experiments brought the proportion up to 27. Gas fire and electric light after a while gave a steady 14 to 15, which, if gas was used for lighting, quickly rose to 32. This was for an ordinary living room. What it would be in a dark room can be easily guessed, and the evil consequences to health surmised. From these data it is clear that all dark-room gas lights should be connected with a flue to carry off the products of combustion; but, with regard to Mr. Jones's deductions from the use of a gas fire, we can only say we should like to know how it was connected with the open air, for it is difficult to imagine how products of combustion could reach the air of a room in a properly ventilated gas fire.

Starlight Photographic Portraiture.—Photographs taken by moonlight are no novelty—landscape photographs, that is to say, taken by the light of the moon alone, not the sham "moonlight pictures" taken in broad daylight, the sun shining, the negative under-exposed, and the print over-printed—but photographic portraits taken by moonlight have not yet, so far as we are aware, been produced. Hence our readers would share with us the astonishment produced by reading in the *Daily Mail* that the feat had been performed of taking a portrait by starlight alone, or, at any rate, by the light of a "fixed star," as a planet has long been termed. The following communication from "our own correspondent" recently appeared in that paper: "Professor William K. Brooks, who is the head of the big Astronomical Observatory at "Geneva," New York, has recently extended his experiments to photography, and on Sunday night he succeeded in producing a remarkably clear picture of Mr. J. Fosdick, his assistant, by means of the rays of Venus alone. He selected the darkest hour of the night after the planet had risen, and carefully excluded all light except that which came from this single star through the open shutter of the observatory dome. He found the light much stronger than he had anticipated, and will continue his experiments with other planets of less brilliancy." We can only remark that Professor Brooks's plate must have been as rapid as the aperture of his lens was great, unless, indeed, we are to understand that the "remarkably clear picture" was a silhouette only.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[FIRST NOTICE.]

THE removal of the Royal Photographic Society's Annual Exhibition to the New Gallery in Regent-street, is a departure of the highest importance and one which must exercise great influence upon the future of British photography. At a stride the Society leaves the last of its old aditions, and finally enters upon a new turn in its career. Far-reaching indeed should be the benefits to photography, as a result of this step. For many years there have been complaints that the Water colour Society's Gallery in Pall Mall gave insufficient scope for an exhibition which would permit photography to be adequately illustrated in its principal aspects. There were good grounds for these complaints. In a desolate-looking gallery measuring sixty feet by twenty feet, it was not possible either to hang sufficient exhibits from each class, or to allow of that division and subdivision which the necessities of the case required. What was pictorial and what was technical depended to some extent upon the whim of the visitor, who, in the absence of any line of demarcation, was to be forgiven if he placed a photogravure reproduction of an oil painting in the first category, and a platinum architectural interior in the second. The apparatus was huddled in the corner of a room, and the whole range of the scientific applications of photography was crowded into a few feet of wall space, at the tail end of the other exhibits; in fact, no classification at all existed or was attempted.

The pictorial workers had least cause of any to grumble at this state of things, for as a rule they took up seven-eighths of the wall space. Indeed, during the last ten years there has been a wide-spread belief that this branch of work has been far too generously treated at the R.P.S. exhibitions. The "bread and butter side" to quote Lord Crawford's own famous phrase, has been persistently neglected. The trade enlarger, the general professional photographer, the apparatus-maker, and the manufacturer, have practically been denied all opportunity of taking part in the Exhibition. The pendulum of progress has swung so far that it is forced out of the field of competition such men as Lafayette, Winter, Byrne, Van der Weyde, Mendelsohn, Werner, and many other clever workers, whose names at one time figured in the catalogue with unfailing regularity. Instead of the conscientious efforts of these men, the glorified snap-shot of the noisy amateur has been singled out for applause, with the result that there has been a falling off of much of that kind of support which at one time was a feature of the Exhibition. With such marked discouragement as it has received in recent years, how could a continuance of it have been expected?

These are some of the blunders which the Exhibition at the New Gallery will retrieve. The pictorial man has a big gallery all to himself. The "general professionals" are placed in two galleries, almost the equal in area of the deserted salon in Pall Mall East; the scientific photographer retires to the elevated seclusion of an upper balcony or gallery, and the apparatus-makers and manufacturers confront the visitor the moment he passes the turnstile and steps into the hall. This disposition of the exhibits appears to have elicited general approval.

On Saturday last the Private View and *Conversazione* attracted many hundreds of visitors, and at every turn we heard expressions of satisfaction with the comprehensive nature of the Exhibition, its size, and its scheme of arrangement. In the Pictorial Gallery there are 350 exhibits headed "photographs," the scientific, technical, and photo-mechanical exhibits (including a few items of competitive apparatus) number 212; the lantern-slide section numbers twenty-eight exhibits, inclusive of colour photographs and stereoscopic transparencies; and the twenty-four exhibitors in the general professional section show, between them, several hundreds of photographs and enlargements. A list of the exhibits takes up fifty pages of the catalogue, and there must be in all between one and two thousand photographs on the walls. The stall-holders number twelve, and the total of the exhibitors is 200. The five galleries—for so we must term them—present an extremely well-filled appearance, and the whole exhibition is so great and so satisfying, there is such a variety, such a wonderful wealth of splendid photography (not, of course, entirely untainted by bad work) that London photographers who have not had the advantage of visiting the celebrated international exhibitions at Bristol, Glasgow, Newcastle, Leeds, and elsewhere, will be able, for the first time, to realise the pleasurable sensation of passing through a number of galleries devoted to the exhibition of photographs—a sensation not hitherto to be obtained at Pall Mall or elsewhere in London.

The importance of the Exhibition from the point of view of public attendance cannot be over-rated. Pall Mall East, where the photographic Exhibition was formerly held, is traversed by comparatively few people; it leads, as it has been said, from nowhere to the same destina-

tion. Regent-street, which for magnificence and grandeur of position is unrivalled, and all the year round is peopled by streams of *flaneurs*, pleasure-seekers, and exhibition-goers, is also easily accessible from all parts of London, and these two facts should tell largely in favour of the attendance. The season's average of 11,000 at Pall Mall should rise very considerably at Regent-street. But we are not looking at the matter solely from a financial point of view. It stands on a higher platform than this. We think that the more people who visit the New Gallery Exhibition the better for a spread of a knowledge of photography in its best aspects. It is in its capability of educating the public at large up to this knowledge that the future of the Photographic Exhibition at the New Gallery should be so extremely valuable.

And in this connexion the hard case of the Photographic Salon really excites our compassion. Last week, when we wrote about the plastic psychological syntheses at the Egyptian Hall, we had not seen the superb show of photographs at the New Gallery. If we had, our natural tenderness of heart towards all struggling institutions might have disposed us to deal a little more gently with what we are driven to conclude is a doomed Exhibition. Years ago we pointed out that the continuance of the Photographic Salon as a separate Exhibition was out of the question, and, despite Mr. Maskell's defensive advocacy, events have shown we were quite right. It is not conceivable that the Exhibition, going public will continue paying 1s. a head to look at a little show of 239 photographs and other things hung in a small back room when, within a few minutes' walk, there is an Exhibition five times as large in one of the noblest suites of galleries in London. The thing is out of the question. One Exhibition is value for money and the other is not. Notoriously the British public, when it parts with its shillings, likes to get the best quantitative, as well as the best qualitative, return, and as between the Salon and the R.P.S., from the point of view of the Exhibition-goer, the comparison is not favourable to the former. But we do not feel called upon to labour the point. We alone have for years denied the need for two simultaneous London Exhibitions—the plea that one is "supplementary" to the other may be swept aside as the sickly twaddle of imbecility—and now that the R.P.S. has at last definitely occupied the whole available field of exhibition photography in Central London, the unswerving law of supply and demand may be trusted to settle the matter. Our contributor, "Cosmos," may be called upon to publish a certain epitaph sooner than he expected!

SCIENTIFIC AND TECHNICAL.

The Scientific and Technical Section at the New Gallery compares very favourably with that of the Society's exhibitions in the past. Hitherto the pictorial show has been spoiled by the presence of the few technical exhibits that the Society received for display, and the Technical Section, on the other hand, has been unhappily dwarfed by the superior numbers of the pictorial exhibits. For some years the cry that the technical side of photography has been neglected by the Society has been growing louder, but we can assure our readers that this state of things was quite an unavoidable one. The Old Gallery has long been quite inadequate as a home for the Royal Photographic Society's annual exhibitions, and none knew better than the Society itself. With this in mind, efforts have long been making for a removal to a worthy place, and, in the New Gallery, we think, that place has, for the present at any rate, been found. The exhibits coming under our present notice are gathered together in the balcony of the Central Hall. By no stretch of the imagination can it be held that the section is in any way representative of the present position of the scientific applications or the technical side of photography; but, as a foretaste of what may and should be another year, it is decidedly noteworthy. The feeling that, in the past, they have been discouraged could not be quickly thrown aside by those upon whom one naturally looks for the exemplification of technical photography and its many scientific applications, but we are confident that the first results of the Society's movement to encourage these workers will be reflected next year on a larger, more gratifying, and representative scale.

PHOTO-MECHANICAL.

Although, strictly speaking, exhibits under this heading form a distinct section of the Exhibition, they will not be found apart, but mixed with the general scientific and technical items. Messrs. Pellissier and Allen have on view a large number of photogravure reproductions of J. M. W. Turner's paintings, including a portrait of the great artist himself. Taken as a whole, they are good enough; some are very good, but the values in some do not appear to us truthfully rendered. The series includes copies of some of Turner's best works, and is an interesting exhibit. We should not proceed further without mention of Messrs. T & R. Annan & Son's splendid photogravure reproductions of paintings

by Sir Henry Raeburn. There are about a dozen of these in two frames, selected from a series prepared to illustrate a forthcoming book on the works of Sir Henry Raeburn. The first frame (No. 407) deservedly secures the only medal awarded by the Judges in this section. Visitors will notice very quickly the fine display of photogravures made by Mr. Ignatz Herbst and Mr. Theodore Reichs. These gentlemen, in whom will be recognised the leading spirits of the Strand Engraving Company and the Art Photogravure Company, have for long been studying the question of the commercial production of large photogravure plates in competition with the Continental houses who have for so long practically monopolised this branch of reproduction. Here we have about a dozen examples of the work now being done by them in England. The patriotic visitor will be attracted by the pictures of Baden-Powell and Sir George White. The former is copied from a painting by the General's brother, Frank Baden-Powell, and the latter from Langfier's recent photograph of the Hero of Ladysmith. The four plates of the Seasons, done in colours, have a very effective appearance, and are fair examples of the work of this firm in the direction of large coloured photogravure reproductions. Other prints by the same exhibitors are from F. Thomas Smith's *Come one, come all*, Farquharson's *Lusty Winter*, Browncombe's *Cheerful Spring*, and a picture by S. E. Waller.

The three-colour printing by Messrs. Raithby, Lawrence, & Co., of Leicester, will at once attract attention. The blocks were all made direct from the objects themselves, which comprise Oriental and other carpets, linoleums, and wall papers, &c., and several water-colour paintings, and all the examples speak well for the skill with which the colour printing of this firm is executed.

The Art Reproduction Company show a number of photogravure reproductions of pictures, half-tones, and photochromes, and in No. 439 a half-tone zinc plate such as is used in half-tone printing.

COLOUR PHOTOGRAPHY.

The present position of colour photography is very well illustrated. In the South Room are to be found two examples of the Lippmann interference process, contributed by Dr. R. Neuhauss—one of a stuffed parrot, his test subject, and another of the solar spectrum. Both are excellent specimens of the best work as yet produced by the Lippmann process, and are creditable enough to Dr. Neuhauss. In conjunction with these, another exhibit (No. 356) by Dr. Neuhauss should be examined. It shows a photo-micrograph (+4000) of a section through the picture surface of the red spectral zone of a spectrum photograph prepared after Lippmann's interference method, and presents very clearly the laminated condition of the film to which the colour effect is due. Mr. E. Douglas Fawcett, a gentleman who has devoted a lot of attention to the Lippmann process, is also represented. His exhibit is rather a collection of experimental results than a fine example of the capabilities of the interference method of colour photography. It shows, in the first place, a heliochrome, without a prism, indicating the density of the kind of image found most satisfactory. This has a special interest as tending to remove one of the many pitfalls of the process, and it will, no doubt, surprise many that so great a density has been found desirable. Examples of great under-exposure, with its characteristic appearance; fuller, but still inadequate exposure; marked predominance of the blues; and of the entire absence of the blues in an otherwise fairly good picture, are also exhibited. Mr. Fawcett's series terminates with an example of accurate exposure, under a good lighting; and a fine specimen, by Professor Lippmann himself, of Versailles and flower beds, not hitherto seen, we believe, in this country.

Another process here illustrated, and about which more is likely soon to be heard in this country is the McDonough-Joly process of photography in colour. The Colour Photo Company have on view some twenty transparencies by this method, many of which are very fine in their rendering of the original. It may be well to again outline the process. The picture is produced by a single exposure upon a single photographic plate, through the intervention of a screen placed in contact with the plate, and ruled in very fine parallel lines in the three fundamental colours, red, green, and violet. The resulting negative is built up of lines corresponding in density with the colours and lights and shades of the original. A glass positive from this negative is then viewed through a second similar screen, properly adjusted, when a coloured representation of the original object is seen. Other processes illustrated are the Sampolo-Brasseur method, of which very meagre particulars are given, and the Sanger-Shepherd process of three stained and superimposed films. Messrs. Sanger Shepherd & Co. have eight very fine slides prepared in this way, and a stereoscopic view by the same method, and in the Central Hall a stand where many other interesting

examples and the special triple dark slide and apparatus required may be examined.

Altogether the exhibits of colour photographs and colour printing are prominent features of the show. That they are popular is shown by the way in which visitors congregate around them. We observe that colour slides by various processes will be shown on each evening that the Exhibition is open, in addition to the ordinary lantern-slide displays, and on three evenings special lectures on colour photography will be given by Mr. Sanger Shepherd.

PHOTO-MICROGRAPHY.

Mr. T. E. Freshwater, is again an exhibitor this year, represented by some very fine photo-micrographs of curious insects, ants, parasites, beetles, and mosquitoes, and a frame of photographs of spiders of various sorts. Mr. Freshwater is well known as a serious and painstaking worker in the delineation of this class of subject, and his latest productions amply maintain this reputation. The Royal Microscopical send a welcome exhibit in the shape of a frame of twenty-four photo-micrographs of diatoms, &c., by one who stands amongst the highest workers with the camera and the microscope—Mr. E. M. Nelson. Some of the specimens are quite superb, and all are sure to attract a large share of attention from the interested public. Our old friend, Mr. Andrew Pringle, shows that he has not forgotten his pet hobby, by the contribution of a frame of low-power micrographs of insects, including the homely flea, and late visitor the mosquito. Dr. Gustav Maun, B.Sc., has not, we believe, exhibited here before. His photo-micrographs of the section taken from the rabbit, cat, and monkey, speak well, however, for his skill, in this interesting branch of work, and the particulars he gives of exposure, magnification, and staining should be useful to others. Mr. J. M. Offord's photo-micrographs of pollen of mallow, eggs of butterflies, and moths, &c., are also worthy of notice in this section.

ASTRONOMICAL WORK.

The Royal Observatory, Greenwich, has a small but instructive exhibit of lunar, astronomical, and solar eclipse photographs in the form of transparencies. We would draw attention to the enlargement of the corona photograph taken by Mr. Davidson at Ovar in Portugal with the new Unar lens of 2½ inches aperture and 12 inches focus. The Rev. Walter Sidgreaves, of Stonyhurst Observatory, exhibits photographs of stellar spectra and of parts of the solar spectrum taken by means of the Rowland plane grating. He also has, in the Scientific Section, some magnetograms, thermometric and barometric photographic records, illustrating some more of the many applications to science to which photography has been put. Mr. J. M. Offord sends some fine photographs of portions of the moon taken with a 12½ inches equatorial reflecting telescope in conjunction with an enlarging lens.

Miss Acland, of Oxford, has a small series of slides showing the eclipse of the sun as seen in May last at Oxford, two of them taken in a hand camera.

LANTERN SLIDES.

The lantern slides and stereoscopic transparencies are of much the same quality as in the past. The best work, unfortunately, never seems to be sent in for competition, which is a pity, because there is no dearth of excellent work and workers, and here, at the greatest and most important Exhibition in the world, one should naturally find them.

GENERAL SCIENTIFIC EXHIBITS.

Amongst the general exhibits which cannot well be separately classified, may be mentioned some prints shown by Dr. W. J. Russell, F.R.S., illustrating the radio-active properties of the metals radium and polonium, and the action of uranium salts on photographic plates. Some thirty plates are also shown, produced by the agency of hydrogen peroxide in the dark. The exhibits possess considerable interest in themselves, and still more taken in conjunction with Dr. Russell's recently read papers upon the action of various substances upon plates in darkness. Professor C. V. Boys, F.R.S., sends a frame of interesting photographs of flying bullets, a class of work peculiarly his own. Visitors will note the wonderful way in which the photograph has recorded the waves of air thrown out by the rapidly moving bullet in its course. Mr. Thomas Manly, the inventor of ozotype pigment printing, is represented by two frames of examples, and it should be observed that the washed initial print in one case was kept for thirteen months before being pigmented.

The Institution of Civil Engineers contribute a series of four photographs by Mr. Cecil Lightfoot, showing the different stages of the sinking of the *Tai Hoko*, in July 1897, from the first dipping of the ship's bows to the moment when, stern in air, it disappeared. A striking photograph is also shown in No. 455, a common shell fired from an 8 inch howitzer, bursting in an earthwork of loam, at a range of 2000 yards.

Captain F. A. Bligh has succeeded admirably with his two photographs of Ice flowers on St. Moritz Lake, natural size. They are not easy to take; but in these the formation is seen to great advantage. The Rev. John M. Bacon, well known for his ballooning expeditions in search of knowledge and the Leonids, has several enlargements showing the cloud loom and experiences incident to ballooning that will not fail to attract notice. The same may be said of a large collection of prints by Mr. Douglas English, who has got together a number of photographs of snakes, toads, and newts, and so forth, taken in an aquarium. Our attention was specially drawn to a photograph of a roach.

It takes the form of a carbon transparency backed up with aluminium, and the realistic effect imparted to the counterfeit by the sheen of the metal seen through the transparency is very clever.

Mr. Edgar Scamell has been following the growth of a nasturtium by daily exposures upon it from May 21 to August 22, and the selection from the series shown in this section has particular interest to horticulturists. Mr. J. C. Shenstone has also undertaken the task of photographing British wild flowers in a manner suitable for book illustration and educational purposes. Both of these exhibits serve very well to show how system can be applied to photographic pursuits, and a result interesting and valuable to others obtained.

Our notice would not be doing justice to the Exhibition without allusion to the series of light images on pure silver plates shown by General Waterhouse, and described by him on previous occasions. We are glad to perceive that he is proceeding with the knotty problem he has set himself, and to clear up which he has already done so much. Dr. Norris Wolfenden's contribution of X-ray photographs of marine creatures; Mr. Bridges Lee's survey photographs taken in various parts of the world with his now well-known Photo-theodolite; and the photo-sculptures shown by the Selke Photo-sculpt Company, of Berlin, will at once attract attention, as also the instructive series sent by the Kodak Company, showing range of exposure, methods of toning bromide prints, and special treatment of papers.

There is a host of other exhibits well worthy of mention, but considerations of space preclude our dealing with them more minutely.

THE STALLS.

The central hall of the New Gallery will be found devoted to stalls, about a dozen in number. The Gallery lends itself with considerable facility to the erection of these stalls, and, although as many as a dozen may be seen, they cannot be said to be obtrusive or wanting in attractiveness.

Messrs. Wellington & Ward have a very dainty corner, designed and executed by Mr. George Walton, who has displayed considerable skill in his arrangements. It is hung with a choice selection of prints on Wellington specialties, and negatives on the Wellington film may also be seen. At night it is specially lighted by a cluster of electric lamps, as are others of the stalls in the building. Next in attractiveness, perhaps, is Griffin & Sons' space, got up under the balcony as a room in a private house with pictures on the walls, and an imaginary street lamp shining through a little window contrived at the back. The scheme of decoration is decidedly good, and here may be seen daily demonstrations of Velox printing and development. Messrs. Goerz devote their space to the display of enlargements from negatives taken with the Goerz-Anschütz folding camera, Goerz double anastigmat lenses, cameras, and binoculars of the Goerz-Triester construction. Two stereoscopes served also to show the capabilities of the Goerz-Anschütz folding stereoscopic camera.

Messrs. Dallmeyer, Limited, Watson & Son, and Messrs. Ross, Limited, have cases of lenses, cameras, lantern and other apparatus of a particularly interesting nature. The stand occupied by Messrs. R. & J. Beck, Limited, has a large number of things which will well repay examination, prominent, of course, amongst them being Frena cameras and the Beck-Steinheil lenses recently put before the British public. Very neat and effective is the little stand erected by Messrs. Burroughs, Welcome, & Co. for the advertisement of their convenient tabloid form of photographic chemicals. This form has become quite an important one among those supplying the wants of amateurs.

To the Kodak Company, who have a very neatly got-up table stand in the middle of the hall, has been awarded the only medal for apparatus, and this is secured by the new Panoram Kodak. The same firm also shows the Brownie and several new folding cameras, modifications and improvements on old forms.

* * Next week in a second notice we shall deal with the General Professional and Pictorial Sections of the Royal Photographic Society's Exhibition.

THE PHOTOGRAPHER'S YEAR.

OCTOBER.

MANY people must be glad to see October come in. Railway officials, for instance, with time-tables brought back to the normal by the dropping of the tourist portions; lodging-house keepers, who for the past three months have been dining in the kitchen and sleeping in the garret; farmers, with the back of the year's work broken, and its spoil under cover in rickyard and barn. The summer traveller, seaside visitor, bread-eater generally, is also probably not sorry to think of a change. There is nothing so short-lived as satisfaction with the existing order of things, however pleasant and favourable. It would be very tiresome and monotonous if it were always summer, and thoughts of coming winter and its crisper life are agreeable ones. These begin to suggest themselves with October. The clear, blustering freshness of the equinoctial gale blows the smoky cobwebs of the dusky Michaelmas summer out of the brain, and acts as a fine, bracing, all-round tonic.

The photographer of the year who may have overdone it in the past favourable months will find the clear and keen air of an October morning act as a valuable counteractant against the reaction that prompts him to put his camera by for the season. In the earlier portion of the month in particular he will find a good deal remaining well worth photographing, and more markedly characteristic of the month itself than the effort at this in any other. If a photograph were taken of what is regarded as a typical scene of each month, and ranged unlabelled side by side upon a table, that of October would be picked out first as most easily recognisable. In our variable climate the picture of one month might very excusably be confounded with that of the next, as the weather of one has such a faculty for spreading over two. January, for instance, might be taken for February, February for March, and, with a delayed spring, March for April, or even May. Fulness of foliage will make August look like June, much as a wealth of hair, against which "the miller's cart has not brushed against," will knock ten or fifteen years off a man's age. The partially fallen leaves of October, however, proclaim its name and place at once. Yet there are many artistic possibilities at this particular stage of nature's yearly cycle of work. Fuller spaces are opened out when the leaves have partly fallen, and many old-fashioned country houses brought into better view that have been until now too closely shut in by greenery. There are upon the same road that we thought we knew so well a dozen fresh points of view, or, more correctly perhaps, fresh views from old points. At the same time the trees are full enough to keep out the suggestions of bareness that must come later. Fallen leaves upon the road in the foreground, clustered as the wind has swirled them together, with the deep-cut trail of the wheel of a country cart passing through, give wonderful realism to a picture of October.

The objection that most people would have even to a highly artistic picture in this month would be the suggestions of death and decay that present themselves everywhere. Age, up to a certain point, is beautiful and attractive, but that point stops short of the stamp of advancing death. The artistic temperament, necessarily a highly sensitive one, feels this keenly. The artistic point of view, too, being essentially that of the outward appearance of things, cannot find so readily the source of consolation of the scientific one, in regarding more broadly and deeply the decay as a necessary process of larger life. The artist concerns himself with the fallen leaf and the naked bough only, and is unhappy; the botanist knows as well of the bud that has been formed where the leaf broke off, and its possibilities. If artistically miserable, he is scientifically cheered. It is unfortunately not a common combination. Dealing with broad masses and the airy and changeable shapes and bounds of light and shade, the artist cannot pin himself down to study the formation and functions of a bud, nor read the meaning of the rectification of a leaf.

If this phase of nature prove too disagreeably suggestive to the artistic and emotional photographer, there are many other subjects still out of doors tinged with no unpleasant colouring. The heavier and more pressing portion of farm work being over for the year, the farmer has time to look to his hedges and ditches, and also plenty of spare labour to prepare them for the extra strain of coming wet and wintry weather. A wayside labourer is well worth noticing. He has generally a very interesting mass of information about all things belonging to the country laid up in his head, and is ready enough to part with it—to the right man. To the wrong man, however, he is "a mere clod"—although it might do this would-be patronising individual a great deal of good if he could only know how accurately this "mere clod" sized him up. Country people have far more in them than the town man, who only comes across them occasionally and superficially, thinks. They know

but little, it is true, of matters that he is chiefly concerned with; but, probably, more than he knows of the country, and its life and doings.

To one who can reach to broad interest in, and sympathy with, them, there are very many fine photographic possibilities open. Appreciative interest, for instance, in what the ditcher has just been saying about the past season, the coming winter, the effect of the moon upon the weather, or even the carrying capacity of a ditch, will wonderfully lighten up his face and strengthen his unconscious pose. There is a touch of individuality about him now that would look well in a picture. He is perfectly willing to be taken; the promise of a copy, if successful, makes him more than willing, enthusiastic. How and where could conditions be more favourable? A quiet country road, an interested subject, fully in keeping with its setting, and the human interest. Why, with just a touch of luck, he might figure as a type, and the negative stand enlarging and titling as "The Ditcher!" Then there is the road-mender of October, and the Irishman who comes over at this time of the year to help dig and "hog" potatoes. The still more interesting tramp also, now that there is a touch of frost in the air night and morning, closes in towards the town, and is more accessible. He is well worth attention from a dozen points of view, each one of which would make a photograph of him valuable. Everything that means success in life the tramp is short of. His appearance so unmistakably proclaims this that he who may have been gifted in short measure—or, as he would probably put it, has met with but indifferent luck in life—can always congratulate himself in a pleasant Pharisaic spirit, that he is, at any rate, better off than this man; and, when a man arrives at the stage of realising that he might be worse off, he has crossed over the boundaries, at least, of the region of content and happiness. Or, if so successful a man—as all photographers, amateur and professional, should be—that he cannot very well open up a comparison between himself and one so far down the social scale, the tramp is still an object of high interest. There is a subconscious dash of sympathy with his freer life, possibly owing to a deep-lying, instinctive reversion to the mode of life of common, though far-distant, roving ancestors. It is the same instinct that induces English boys to read *Treasure Island* and *Robinson Crusoe*—the grandest old tramp of all—and sends them to sea, and the distant corners of the Empire. As for their elders, does not the blood run more freely and easily when thinking of a bicycle tour, a yachting cruise, or a fortnight under canvas! If these be too far-fetched, our tramp has a marvellous store of information of things that be, hopeless to look for in a book—for he is another marked instance of the truth of the statement, "That he who knows cannot write, and he who can write does not know!" It is but a slight lack of balance of brain molecules, after all, that makes one man a tramp, and another a town mayor. He—the tramp, certainly not the mayor—is not over-anxious, as a rule, to be photographed, partly from a surviving remnant of shame at his possible drop in the social scale, but chiefly because he may have a "history." A little genial breadth of view, a little tact, and a shilling, will go far, however, in gaining the point. We make big efforts to portray "his Worship the Mayor" in his robes; the tramp, in his makeshift clothes, is far more interesting artistically—and very often far more interesting in other directions as well.

Our forefathers called October the "wine month." Why, it is hard to say, for there could never have been wine enough made in England to justify the term as indicating any such very general operation. "Beer month" would be nearer the mark, for the October brew, with the new malt and hop, was, and is, the best and most important of the year. Home brewing is fast disappearing, like a good many home other things; the more's the pity, but in quiet corners it is still possible to come across the home process of beer-making. It is a distinctive and interesting one, and, with some care and careful arranging, possible to photograph. The whole of the kitchen or out-house may be out of the question, for the light in old-fashioned kitchens is not by any means of the best. It will be possible, though, to get the large copper pan set upon the wide, open fire hearth, and the figure of the stirrer of its contents, with a suggestion of characteristic surroundings. Irregular and roughly vignetted, it might "turn out trumps." Farmhouse people have plenty of time to be obliging and courteous, and the camera is not familiar enough to them to be uninteresting. With rather a contempt, often, for the objects the photographer wishes to gain, as being to them so commonplace, they will take great trouble and pains to meet his wishes. The cider press will also now be in action, lending itself even better than the brewing to photography. The fire is absent, fire being, with a lengthened exposure, very awkward to express properly. A difficulty in both cases will be the arranging of figures to sustain a natural appearance for the probably long exposure, the temptation to look at the camera and see what is going on

being so strong. After all the trouble, both, if not rank failures, may be but modified successes; but there is also a chance of gaining an unqualified success. If so, it will be a far higher prize than the orthodox success in getting the glen, waterfall, or romantic-looking show village squeezed up in the narrow, well-wooded valley. It is more distinctive and unusual, and the difficulties in taking it have been so much greater.

If a worker of a sporting turn of mind would have pictures to fill in his all-round series, this month is as favourable as, if not more so, than the ones at the other end of the winter season's sports, when the light is about the same. Football is well under weigh, and a reasonably clear day will admit of the necessary snap-shot with a rapid plate. The hounds and huntsmen at the covert side will make a better picture than in early spring, from the fact that the trees and country generally, though bare, are not too much so.

At closer range the cobweb covered with rime in the hedge, or, better, considering background perhaps, anchored down to the withering fronds of adjoining ferns, is both exquisitely beautiful in itself, and will lend itself well as a positive on glass to dainty decoration. The same can be said of a tassel of fir cones, a spray of late-ripening hop, and the hardy sedges now standing well and prominently out of the water.

In short, although October, at the first glance, may seem lacking in suitable subjects for the camera, a little closer looking will bring to light an ample supply.

THE SITTER'S RECOMMENDATION.

WHAT part do the recommendations of his clients play in the building up and extension of a professional photographer's business? The question is interesting, because rather difficult to answer. Advertisement is said nowadays to spell success, and certainly none better could be had than the personal praising of our work to others by people we have pleased and satisfied. Can the photographer, then, rely on such kindly remembrance as a necessary consequence of the creditable execution of his orders? Every owner of a studio is well used to friendly and unsolicited promises of recommendation from sitters he has had the good fortune to entirely satisfy; but, after the first flush of gratification has died away, how many of them call to mind their benevolent intentions? Only a very slight knowledge of human nature is required to anticipate the reply, that the proportion is small indeed. This statement is made in no unkindly or carping spirit; possibly many excuses may be found, among which, no doubt, bad memory may be included. What photographer is there who will not on occasion speak feelingly and sadly of that quick realisation of the instability of good intentions which is one of the first lessons learnt in the school of experience? A fair damsel, for instance, the pride of a family of some local standing, comes to sit for her portrait, beseechingly asking to be made as good-looking as possible. Her proofs turned out things of beauty. Pleased and delighted, she hints at speedy visits from all her friends and relatives, each similarly charmed and anxious to become possessed of equally good photographs of themselves. But, alas! not one of them comes, nor does the young lady herself ever increase her original order!

Many such a case will easily recur to the professional memory, and does not tend to enhance our faith in the practical value of hastily made promises. To be sure, now and then we come across a specimen of that *rara avis*, the sincerely and lastingly appreciative sitter, whose recommendation brings custom to us. It is not always those who most demonstratively express their satisfaction who are really the best pleased, and sometimes the knight of the camera is agreeably surprised by new sitters mentioning, as having induced them to come, some past client whose commendation was least expected. It has even happened that fresh custom has come by the instrumentality of those who were absolutely angry with their portraits. An amusing example occurred lately. A rising photographer had, by one of those perverse mischances that none may avoid, taken a really execrable portrait of a certain provincial mayor. To call it even a caricature would have been flattery, and the perpetrator had resigned himself to the abandonment of all hope of any orders or patronage from that quarter. To his intense surprise, however, scarcely a week after, appeared the mayor of an adjacent town, saying he had been advised to come there for his portrait by the municipal magnate before mentioned. The result was eminently satisfactory to the photographer, and, meeting later the client of whom he had taken so unflattering a picture, he ventured to thank him for his kind recommendation. His worship grunted: "Oh," said he, "I didn't tell the man to come to you because I liked my pictures, but because I detested him!"

Such occurrences as that just related are, needless to say, sufficiently infrequent to be safely ignored from the standpoint of business utility. As we have seen, even when the sitters are pleased, it by no means follows that they will try to influence others in the photographer's interest. Unquestionably in the past personal recommendations were more frequent, and had far more value in building up a profitable connexion than at present. Nowadays people have more independence, are more in the habit of judging and choosing for themselves, and therefore less likely to take anything at another's valuation. If it appeals to them as good and worth their having, they will straightway patronise it, whether or not it is praised by some one else.

If, then, the photographer has not much to gain by the favourable mention of his clients, can it be said that he has nothing to lose by adverse comments when his work is for any reason unsatisfactory? It is, unfortunately, true that the public are, at the best of times, difficult to please, and that, when discontented, they find no particular difficulty in communicating their grounds for dissatisfaction to a wide circle of friends and acquaintances. A gets a picture of Mrs. A, for instance. Now, the latter is decidedly good-looking, and is well aware of the fact. Her portrait, however, renders her as a decidedly dowdy and unattractive female. Perhaps it was her fault, perhaps the photographer's, be that as it may. The indignant A shows the offending print to sympathetic kindred, and cronies by the dozen, each of whom helps to pass censure on the unlucky artist, probably forming also resolutions never to give him a sitting. It is evident how much real harm may be done to a photographic business in this manner. The taking of one bad picture is, in fact, sufficient to counterbalance the good effect of a score, acting as a powerful anti-advertisement. We all know that failures must be; no man is infallible, and, where there are so many factors of disturbance to be overcome, little wonder that even the photographic Homer sometimes nods. Happy is the portraitist who makes the fewest mistakes!

There are occasions, undeniably, when the cleverest operator living could not produce a satisfactory result to save his life, as, for example, when a more than usually ill-favoured individual has to be taken. It is at such times that the artist wishes fervently that he might venture to adopt the procedure of some of the early lights of the profession, and exercise a right of veto on his sitters. But, no, the uninviting face must be reproduced, with what little alleviation retouching can give, then to be shown round and expatiated upon, more or less to the photographer's detriment.

If it is not always possible to secure an artistically pleasing portrait, it is certainly in our power to see that no badly finished or slipshod work is ever allowed to pass. People are more given to noticing such lapses than might be imagined; indeed, it may almost be said that the public would rather have a second-rate picture well finished than a first-rate one that is not. We may flatter ourselves that our clients will not notice such trivialities as a tiny lump carelessly missed in the mounting, a roughly cut edge or imperfectly square corner, and suchlike little offences against perfect technique, but our hopes are falsely based. They do notice them, and also that other photographers avoid such lapses. So our critics draw their own conclusions, and very probably make haste to communicate the same to others, in a manner hardly conducive to our best interests.

The few recommendations that are given by the sitters are often quite as much the result of their appreciation of courteous treatment as of satisfaction with the work done for them. It is wonderful how politeness and diplomacy pay in the world of business. The public enjoy having their little idiosyncrasies considered, a certain amount of gossiping patiently listened to, or to be discreetly complimented on a pretty dress or fashionable coat, when it can be done without officiousness. Courtesy is easily cultivated, there is nothing hollow or false about the genuine article. Where servility and sugared falsehood fail to impress, true politeness generally brings its reward. Employers, as a rule themselves the most courteous of men, would seem to some extent to be aware of the importance of the manner in which their customers are received by the stress many of them lay on the necessity of obtaining tactful and clever receptionists. In some reception rooms, though happily very few, the sitter is treated with chilling indifference, and led to the studio as a criminal going to execution. It is hardly necessary to say that such treatment is not productive of recommendations, to say nothing of good orders.

It has certainly been the happy fortune of some photographers to have clients whose generous patronage and good words have helped them to establish a successful business. Such cases, however, are very rare, and not to be reckoned among ordinary probabilities. It would appear, then, that a professional reputation principally depends on ability to produce good work. Each picture turned out by a truly capable man is

a finger-post pointing all who see it to his studio. An artist of genuine ability, provided only that he have a certain aptitude for business, need fear no lack of customers if he has no other advertisement than the products of his skill.

A. LOCKETT.

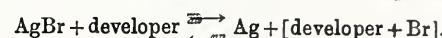
EXPERIMENTS CONCERNING NASCENT SILVER AND THE PROCESS OF DEVELOPMENT.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

The nascent silver theory assumes that the action of the reducing agent of the developer upon bromide of silver produces a super-saturated solution of silver, and that the metal is precipitated upon the minute particles of silver which may be present. The many tempting advantages of this theory distract attention from certain difficulties, and these have recently been referred to by one of the joint authors of this paper. Substantially the following difficulties must be met:—

1. The impossibility of developing bromide of silver films of variable thickness in similar proportion with a developer free from silver salt, whereas the presence of a silver salt in the solution renders it possible.

2. The impossibility of increasing the opacity of chemical fog to any desired extent with ordinary developers not containing silver salts even if the reaction is far from having reached a state of equilibrium:—



3. The slight lateral extension of development from the exposed to the unexposed portions of a plate, as proved by the experiments made by Eder and Schaum.

4. The impossibility of developing the under-exposed parts of a thickly coated plate through to the glass.

All these difficulties are removed if the theory of super-saturation is enlarged by assuming that reduction and precipitation of silver from a super-saturated solution takes place in proximity to particles of silver bromide predisposed to development by the action of light.

With regard to irradiation due to development, we have not yet any conclusive experiments. The lateral extension may be due to slight halation. The importance of diffusion of light and transparency of film will be shown in a subsequent treatise. No value can yet be attached to Eder's experiment in contradiction of point 4, as particulars of the physical conditions are entirely wanting from which an opinion of their conclusiveness might be formed. (This relates to the amount of absorption of an indefinite quantity of light by a film of indefinite thickness.)

On the other hand, a complete investigation should deal with the proof of those facts, which are regarded as material evidence of the action of nascent silver, and therefore as the principal support of the super-saturation theory. These mostly relate to Abney's experiments concerning the transmitted development of unexposed silver bromide and the interpretations which have been placed upon them.

We started afresh with the Abney experiments, which one of us had already made,* mostly with negative results, and we repeated them, taking all due precautions. The experiments which Abney described in the treatise published in 1877 appear to have been made exclusively upon collodion plates, which after exposure were half recoated with collodio-bromide of silver, or collodio-bromo-iodide of silver, and then developed. The important fact of Abney's experiments was that the recoated half showed intensification after development.

"An ordinary dry plate," is only mentioned once in the treatise, and it is not stated, as was then usually the case, whether a collodion or gelatine plate had been used. Our experiments have been made almost exclusively with gelatine plates, as the subject is of greater interest. Both normally and under-exposed plates were prepared and coated with collodion emulsion before development in accordance with Abney's procedure.

In a large number of cases, in which various developers were used (hydroquinone, ferrous oxalate, and pyrogallol more especially), no intensification was observable upon that part of the plate which had been recoated after exposure, when the collodion emulsion which was used contained no free silver nitrate, and this was also the case in our previous experiments. On the contrary, even after prolonged development, the recoated portion always appeared to be thinner. But, if free silver nitrate be present in the collodion emulsion, or if a soluble silver salt be formed by the developer, as, for instance, pyrogallol and ammonia, then, as might be expected, a considerable intensification takes place. In our experiments the silver salt was introduced to the film by pouring over the stained collodio-bromide plate a sensitising solution, which

* Precht, *Archiv für Wissenschaftliche Photographie*, ii. 3, 1910.

contained a dye as well as silver nitrate. A portion of the solution containing the dye also formed part of the same emulsion used for coating. The quantity of AgNO_3 in the emulsion and the period of development were varied in twenty-three of the experiments, and both ferrous oxalate and alkaline pyrogallol were used as developers. There was no intensification in any single instance when the silver salt was eliminated by sufficient washing before development. Some contradictory results occurred at first, but were due to insufficient washing before development.

We conclude from these experiments that the intensification which has been observed with plates recoated with collodion emulsion is connected with the presence of free silver salt, and we must infer that, in Abney's experiments, and likewise those made at the Vienna Technica School at the instance of Bredig, and quoted by Eder, small quantities of free silver salt probably influenced the results.

With reference to the experiment made at the instance of Bredig and described by Eder, in which the direct contact of the films of collodion and gelatino-bromide emulsion was prevented by interposition of a thin film of gelatine, it appears to have escaped Bredig's attention completely that a similar experiment was described by Abney, and gave an opposite result from that stated by Eder, for reasons to which we shall refer. Abney coated iodide and bromo-iodide plates with tannin and diluted albumen, and dried them. After exposure each plate was half coated with collodio-bromide, and developed with strong alkaline pyrogallol. The unprotected iodide only showed traces of an image, which, according to Abney, was due to the formation of a sensitive albumen salt (with free silver nitrate).

Doubtless the formation of the image is due to the free salt of silver, and, if this be the case, it must be inferred, in the case of the Vienna experiments, that the free silver salt in the collodion emulsion, to which intensification is probably due, did not have time, in the process of development, to pass through the intervening five per cent. film of gelatine, for, according to Abney's own statement, the free silver must have penetrated the film of albumen. In Abney's experiments intensification was also absent when the intervening film of albumen or gum was very thick.

We think we have thus explained the contradictions, but we must state that, in the work of Abney's to which we have referred, neither gelatino-bromide plates nor collodio-chloro-bromide emulsion are in question, and we must therefore conclude that the original paper was not at Bredig's disposal. We should also mention that the image was sometimes more marked in the exposed film, and at others in the second coating. This depended upon the developer, which was either pyrogallol with ammonia, or caustic potash, and is explained by Abney's observation that silver bromide is soluble in ammonia and insoluble in caustic potash.

Our experiments do not, however, entirely preclude the possibility of the action of nascent silver, for in such case it should not be possible to intensify a negative by coating it with emulsion and developing it. In relation to this we proved the fact that no intensification takes place if a negative be coated with collodio-bromide without any free silver salt, and then developed, without exposure to light, with a solution of such strength as generally used in the collodion process. The experiment may be easily made with Dr. Albert's plain emulsion and hydroquinone developer, but a strip should be removed from the negative before coating it with the emulsion in order to ascertain the presence of chemical fog. If, under similar conditions, the plate be developed with strong alkaline pyrogallol, as, for instance, the usual pyrogallol-soda or pyrogallol-acetone developers, taken in ordinary strength for gelatine plates, it will be seen that considerable intensification actually occurs; but in our experiments we also noticed a considerable amount of chemical fog upon that part of the plate from which the gelatine film had been removed.

Upon developing gelatine plates coated with collodion emulsion after exposure we also found in some cases, where a strong solution of alkaline pyrogallol had been used, that intensification corresponding with the amount of chemical fog had occurred, but it was entirely absent upon development with a normal solution of ferrous oxalate, and it could not, therefore, be ascribed to the action of nascent silver. As Abney has expressly drawn attention to the very marked alkaline character of the pyro developer he used, it is possible that his results are partly to be accounted for in this way. Concerning the Vienna experiment, it is also impossible to pronounce an opinion in this respect.

Finally, we wish to add a few remarks concerning experiments with gelatine plates which were coated with a second film of gelatino-bromide emulsion. This can be done without detriment to the first film by reducing the temperature of the emulsion to 18°C ., and, after pouring it

upon the plate, spreading it by means of a glass rod or broad spatula. The excess is allowed to flow off. We used a normal gelatino-bromide emulsion, similar to that with which the plates were prepared, but diluted with four times the quantity of water. It is then possible to spread it well at 18°C . Failures attending the use of a more highly tempered gelatine are thus avoided.

An increase of density was observed, with both plates and finished negatives, when treated in this way. If the same precautions be taken as mentioned above, and plain glass plates coated with the second emulsion be simultaneously developed, a guide to the amount of chemical fog is obtained. If the veiled plate be placed upon the normal half of the plate which has been coated a second time, the intensification and gradation of both halves of the plate, upon which the experiment has been made, will be found the same. It is therefore impossible to conclude from these experiments that there has been any contributory action of nascent silver. With developers characterised by little or no tendency to fog, such as ferrous oxalate under 18°C ., the intensification is slight or absent when the period of development is not too prolonged. At a higher temperature, and with developers prone to fog, such as pyrogallol, para-amidophenol, &c., it is considerable.

Some new and interesting results were obtained in two other series of experiments. Some gelatino-bromide emulsion, which it was just possible to coat at 27°C ., was used for the preparation of some ordinary plates, and some test exposures were made to verify their reliability. A very thinly coated stereoscopic plate was half recoated with a measured quantity of emulsion, and, when dry, exposed in a stereoscopic camera upon a test object, a target formed of black-and-white concentric circles. The thick and thin halves of the plate, in this manner, were both exposed to exactly the same amount of light. By coating the thin half of the plate after exposure with a similar quantity of emulsion at 27° , and drying it, a plate of the same thickness of film throughout was obtained. This was developed with ferrous oxalate. If the action of nascent silver contributes materially to the effect of development, it might be expected that the half coated with emulsion after exposure should show the same opacity and characteristics as the other normally exposed, thickly coated half. But this was by no means the case. The half which had been coated a second time after exposure was inferior in opacity and contrast to the other half. If the former fact be opposed to the theory of the action of nascent silver, then the want of contrast must also be taken as further confirmation of the same conclusion. We contrived to strip the unexposed film from the exposed film supporting it, and, to our surprise, found that the former exhibited a positive image. In the supplementary film the black circles of the test object were black, and the adjacent numbers also. Instead of there being any nascent silver action, the contrary was the case.

To obviate any rash conclusions, we varied the thickness of the film and the period of exposure in another series of experiments. The plates were coated with a wedge-shaped film of emulsion, and the second film was also of similar form. In this case it was necessary to dilute the normal emulsion for the supplementary film with an equal quantity of water. The thermometer used as a rod in spreading the second film, as previously mentioned, registered a temperature of 27° . Numerous experiments gave results the same as already described. Only in two instances was there any confirmation of the action of nascent silver, and this was indicated by a negative image in the emulsion supported by the thin film which had received the exposure. Both instances showed a coincidence of definite values for thickness of film and period of exposure, and were characterised by marked under-exposure and attenuation of both films. Although this manifestation of the action of nascent silver was quite exceptional in the course of our experiments, it indicates the possibility of transmitting development according to the nascent silver theory, but, in the presence of the opposite result in a large number of other experiments, it cannot be considered of much importance for the explanation of the process of development.

If we summarise the results of these experiments with double-coated gelatine plates, it must be said that the upper, unexposed film usually presents a positive (chemical fog), or no image, when treated with the developer, but that in a few exceptional cases there is a transmitted image, or intensification of the underlying negative, in accordance with the nascent silver theory.

The formation of a positive image in the unexposed supplementary film may be explained by the gelatine acting as a chemical sensitiser (especially when there is a slight increase of temperature) and taking up a part of the bromine liberated by the exposure to light. The presence of bromine with gelatino-bromide of silver renders it less susceptible to development, as it hinders the liberation of further bromine. Such parts of the supple-

mentary film are consequently less affected than those which are situated above the unaltered bromide of silver, and we thus obtain a positive in the supplementary film instead of uniform chemical fog.

So far as we are aware, it has never been urged against the nascent-silver theory by former writers, that very clean images may be produced when bromide emulsion is developed upon a substratum of silver foil. Bühler, of Schriesheim, has recently introduced as a commercial article a bromide paper with a metallic support for the emulsion (this is not silver, but an alloy of aluminium). The metallic substratum does not in the least affect the purity of the unexposed portions of the film.

Eder cites a more recent experiment of Abney's, in which an under-exposed gelatino-bromide plate was partly coated with chloro-bromide emulsion after exposure, and when submitted to alkaline development appeared as though normally exposed at those parts. The image was found to be largely in the unexposed, supplementary film. As Eder does not mention whether this experiment has been published and where, we have only been able to repeat it according to the particulars given. We have not been successful in the manner described, but, on the contrary, the results were much more in accordance with the experiments we have already mentioned.

We are of opinion that the action of nascent silver cannot be regarded as of importance in the process of development until new and stronger evidence is offered. We would rather look upon the occasional experiments of Abney, Herzog, and Luther as preliminary, in so far as they may be in favour of the action of nascent silver.

In the work to which we have referred, Abney expresses the opinion that "the atom of reduced silver at once unites with the adjacent molecule of silver forming sub-bromide, which is reduced to the metallic state, that these two silver atoms unite with other molecules of silver bromide, and so on, and that the image is thus gradually built up." This theory has recently been expounded by Liesegang, but, apart from purely chemical considerations, it is open to the objection, that it presupposes the presence of silver or silver sub-bromide in the exposed silver bromide.

If we adopt the theory expressed at the beginning of this paper, which we will now further amplify, we avoid not only these difficulties, but the hypotheses which are shown to be unnecessary by the facts we have observed. We assume, for reasons which have often been given, that the developer reduces more silver bromide than is directly changed by the action of light, but we affirm that only those particles of silver bromide are very materially reduced which have suffered change by exposure. The nature and extent of this change should be looked upon as unimportant, and, in order to understand the process of development, it is unnecessary to adopt any hypothesis concerning the nature of the latent image, and this should be regarded as a considerable advantage. In more precise language we may say: The speed of the reaction of bromide of silver + developer $\xrightarrow{\text{catalytically}}$ silver + [developer + bromine] is accelerated catalytically at the exposed parts in proportion to the effective energy of the light, and this in proportion to the concentration of the catalytic agent. Only upon such a supposition is it possible to understand that the law of Bunsen and Roscoe, for direct conversion by light, is also true as a whole for developed gelatino-bromide of silver. This point, which is of the utmost importance, has not been taken into account in any theory up to the present, although a large part of the scientific and practical application of photography directly depends at least upon the approximate validity of the law.

We think it important once more to emphasise the fact, that our theory is independent of the substance of the latent image, and that it consequently leaves room for due consideration of the possible part the gelatine may play in the formation of the same, a factor which has hitherto been undervalued and disregarded.

J. PRECHT and W. STRECKER,

Photographic Laboratory of the University Archaeological Institute.
Heidelberg, June, 1900.

THE PERISHABILITY OF PAPER.

The following notes on this important subject, which is of direct interest to photographers, are quoted by a contemporary from a Canadian official report:—

"It is important to recognise the fact that a great revolution has taken place in the manufacture of paper, and that a very large proportion of the books and documents of the present day are doomed to crumble away on the shelves of the archives and libraries established and endowed to preserve them. It is not, perhaps, to be regretted that the vast mass of

cheap books and periodicals will be resolved into dust under the influence of light and air alone, without the aid of any human agency, but it is to be regretted that literary works of value, and even documents of great importance, are still written and printed upon materials whose perishable nature is not taken into account.

"The durability of ancient books is very remarkable. The productions of the very earliest presses have come down to us as bright and clear and solid as when they were first printed. The paper is tougher, and the ink as black as in the works of the present day. The books which Columbus read may now be read as easily as when they were first printed, and the notes he made on their margins are as legible as when he wrote them. The entries in the Customs House Records of the reward paid for discovering America are still black, but, upon the receipt for the amount paid in the Alabama award, some of the endorsements have turned brown and are fading away.

"The perishable character of recently printed books is due mainly to two causes: the use of wood pulp not thoroughly prepared, and the introduction of heavily clayed glossy papers necessary for printing photographic process blocks of low relief. The defective material in these last papers is covered up by the clay with which the interstices are filled and the surface covered. The weight of the paper is increased by the heavy loading, but a fold across the corner of a sheet will show that its brittleness is increased in proportion.

"The danger of using paper made from wood for important documents was soon observed in Germany, where such paper came first into use, and, because of its cheapness, was very generally employed.

"The Prussian Government took up the matter and made very stringent laws upon the subject. It established standards of quality and enacted that all papers for permanent documents should be submitted to official tests. The issues of the German publishers for a number of years (until, in fact, quite recently when these conditions came to be appreciated) show abundant evidence in their brown margins and brittle edges of the perishable nature of the paper used.

"It is not, however, to be assumed that paper made with the admixture of wood pulp is to be condemned if the resinous matter is eliminated and only the wood cellulose remains. It is not likely that we shall ever again use paper so durable as that used when printing was first invented. The papers of those days were made of linen, cotton, and hemp fibres, and these materials are as enduring now as ever, but modern taste insists on their being bleached to a high degree of whiteness."

CARBONA PAPER.

At the meeting of the London and Provincial Photographic Association on September 27 a short discussion took place *re* the coagulation of silicate of soda and dextrine. Mr. Henderson, having made several experiments, came to the conclusion that these two will not coagulate, Mr. Wilkinson having quite an opposite opinion.

Mr. Nightingale then gave a demonstration of carbona paper. He said: The printing-out paper which has recently been introduced by Messrs. Griffin will doubtless claim attention on account of the ease and certainty with which the varying grades of warm tones may be produced by brief immersion in a gold toning bath. The risk of over-toning is practically nil, since prints remaining in the toning bath longer than is necessary for purple tones do not assume the unpleasant bluish appearance of the orthodox "over-toned" print. From purple, the image becomes purple-black, until, finally, a stage is reached at which the print, when dry, will be quite black and white, almost resembling the results obtainable on Velox and bromide papers.

By the use of a platinum bath acidified with either phosphoric or nitric acid, prints similar to those on collodio-chloride paper are obtained. Ordinary combined toning and fixing bath yield warm browns only.

Referring again to gold toning, the proportion of gold in the bath available for warm tones is one grain to twelve fluid ounces. For sepia to black tones a stronger bath is employed, eight fluid ounces of water only being used. Toning with either bath is very rapid, immersion for two minutes yielding black tones, whilst sufficient action results in about fifteen seconds to produce red-browns.

It may be urged that rapid toning means a tendency to uneven tones on the finished prints. With ordinary care, this is certainly not so, and an innovation which reduces, even to a slight extent, the time occupied in any part of a photographic process is sure to be welcomed by both amateur and professional.

In employing the platinum bath prints should be toned separately, since the action of this bath on Carbona paper is very rapid.

When placed in the fixing bath a solution of hypo of two ounces to the pint, the print assumes a considerably colder colour, a fact for which due allowance must be made. As an instance, for warm browns the print

must be removed from the toning bath while still a brown red; in fact, the alteration in colour is scarcely perceptible until fixing is commenced. In such a case it is therefore preferable to time each print, allowing from fifteen to twenty seconds in the toning bath. After toning, the print must be well washed and fixed for about five minutes. Washing is complete in from half to three quarters of an hour in running water.

It may be of interest to mention that prints of a most satisfactory blue tone may be obtained by direct toning. The results are unlike those afforded by the ferro-prussiate process, since the blue is decidedly deeper and more pleasing. By comparison with the matt papers of commerce, Carbona yields a wider range of tones, prints at least as quickly, tones very rapidly, and may be roughly handled without risk of damage, since the film is specially toughened.

BUTLER'S IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS FOR PRODUCING AND VIEWING IMAGES IN NATURAL COLOURS.

[Patent No. 9936 of 1900.]

THE invention comprises a system of dividing the spectrum into four ordinate colours, two of which combine in their proper proportion, and act on the retina of one eye to produce all the colours of half the spectrum, and the other two ordinate colours combine in their proper proportion and act on the retina of the other eye, to produce all the colours of the other half of the spectrum, so that the impression produced is that of a complete view in all its natural colours.

It consists of a camera fitted with stereoscopic lenses, and a sliding arrangement inside with suitable means of holding a transparent reflector at an angle of forty-five degrees with the base of the camera.

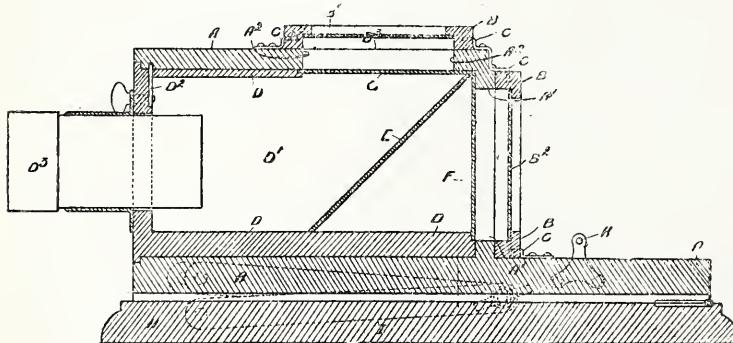


FIG. 1.

This may be coloured or not, but four suitably coloured screens must be fitted to the camera for viewing the pictures, so that each one of the four images on the two plates differs from each of the others as much as possible. The colour spectrum being divided into four parts, say one is red, the others must be yellowish-green, greenish-blue and violet. The ordinates may be selected from any other part of the spectrum, but a true quarto division is necessary to ensure balance and truth in the result. Each of the colour screens may consist of one, two, or more elements.

Coloured screens may be placed before the lenses, or behind, or both. The image through the lens is filtered of half, say, the warm rays. Part of the filtered rays then pass through the transparent reflector, and are again filtered before reaching the sensitive plate, placed perpendicularly

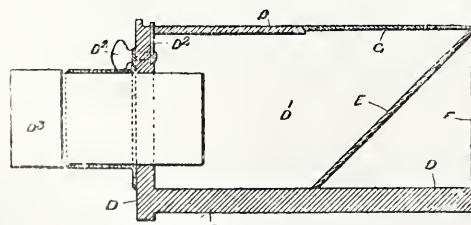


FIG. 2.

or otherwise in a dark slide, and part are reflected upwards, again filtered and focussed on a sensitive plate placed horizontally or otherwise in a dark slide.

The image through the other lens is filtered, part transmitted and part reflected, and focussed on the other half of the two sensitive plates in like manner.

The four images are taken simultaneously at one exposure. The local density of each image differs according to the strength of colour repre-

sented. Transparencies are subsequently prepared from the negative for viewing the picture.

A quarto division of the spectrum is used in the instrument for taking as well as for viewing the pictures, and another casing, or, as described, the same casing may be used for both taking and viewing by having a double set of mounted colour screens, one to slide into the camera for taking and the other for viewing, both on the quarto division principle,

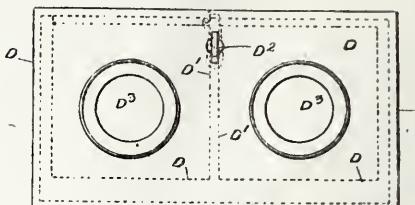


FIG. 3.

the set for taking the pictures being modified to suit the different actinic power of the several parts of the spectrum, and having suitable lenses and transparency plate-holders substituted for dark slides.

Fig. 1 is a vertical section of a stereoscopic colour camera constructed in accordance with my invention and designed also to be used as a stereoscope by the withdrawal of the inner portion, which is provided with lenses and constitutes the camera proper, and the substitution of a similarly constructed portion having stereoscopic lenses; or the camera and stereoscope may form two separate instruments, as hereinafter described. Fig. 2 is a vertical section and fig. 3 an end elevation of the camera proper, shown separate from the outer casing, which latter is designed to form an outer casing, as also to hold the sensitive plates, or the transparencies taken from these, according as the instrument is being used as a camera or stereoscope. Fig. 4 is a vertical section, and fig. 5 is a plan of the instrument showing the same in use as a stereoscope, a stereoscopic inner portion being substituted for the camera proper, and

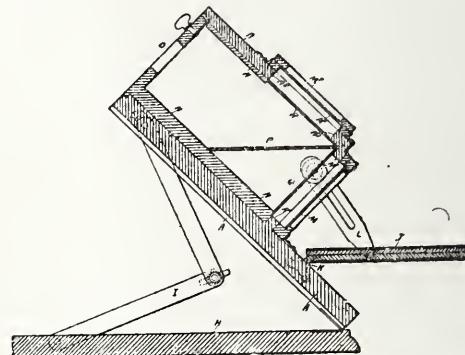


FIG. 4.

figs. 6 and 7 show in longitudinal vertical section and end view respectively the stereoscopic inner portion separate from the casing.

Referring to figs. 1, 2, and 3, the instrument (which is shown at fig. 1 in use as a camera) consists of a box-like casing A having orifices A¹, A², over which slides B, B¹, carrying sensitive plates B², B³, are fitted, these slides being retained in position on the casing A by guide strips C or otherwise. Within this casing A a removable camera D is fitted and secured by a catch D² or other device to said casing, the camera D being divided longitudinally by a web D¹ and furnished with lenses D³

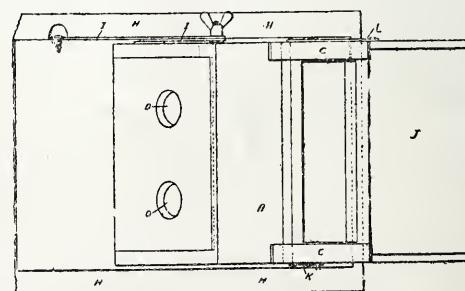


FIG. 5.

Coloured screens may be placed either before or behind the lenses D³ or both before and behind, and near the end remote from the lenses D³ a transparent reflector E is placed at an angle of forty-five degrees to the bottom of the camera body, this reflector being either of clear or coloured glass.

At points horizontally behind and vertically above the reflector E,

coloured screens F and G are fitted, either in orifices in the camera D or in the orifices A¹, A² (already referred to), in the outer casing A, the screens F, G, being arranged in pairs, one of each pair being opposite a lens immediately in front of and under the sensitive plates B², B³, respectively, and being arranged to receive either transmitted or reflected light from the reflector.

The image passing through either lens is, by means of the coloured screens, in front of, or behind, or both in front of and behind one of the lenses D³ filtered of half, say, the warm rays of the object, part of the filtered rays then passing through the transparent reflector E, and part being reflected upwards. The transmitted rays before reaching the sensitive plate B² on which they are to be focussed, are again filtered by that portion of the coloured screen F opposite his lens, this portion of the coloured screen representing one-fourth of the spectrum colours. That part of the rays passing through this lens and reflected upwards by the reflector E, before being focussed upon the sensitive plate B³ is again filtered by means of that portion of the screen corresponding to the portion of the screen F above referred to, this

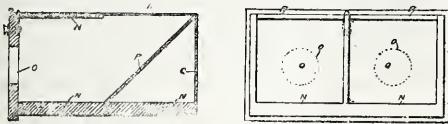


FIG. 6.

portion of the screen G also representing one-fourth of the spectrum colours, and being the complementary colours to those of the screen F. The image passing through the other lens D³ is filtered, transmitted, reflected and again filtered in exactly the same manner as already described, at the same time, so that four images are taken simultaneously at one exposure, on separate portions of a pair of plates, from which transparencies are subsequently prepared for viewing the picture.

Referring to figs. 4, 5, 6 and 7, for the purpose of using the instrument as a stereoscope, the casing A is preferably hinged to a sole H and is arranged to be secured at any angle to the latter, as shown at figs. 4 and 5, by means of jointed arms I. A mirror or reflector J is also provided and is pivoted in bearings K secured upon the casing A, this reflector J being adjustable by means of the slotted arm L to reflect the light at the desired angle. An inner box N (shown separate at figs. 6 and 7) having stereoscopic lenses in orifices O, but otherwise constructed exactly as the camera D with reflector P, and coloured screens Q, R, is fitted within the casing A and the transparencies M, M¹, taken from the negatives B², B³, are substituted for these negatives in the retaining strips C when the instrument is used for this purpose.

The casing A may be made entirely separate from the sole H or be removably hinged thereto if desired.

Our Editorial Table.

"JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUCTIONSTECHNIK."

Wilhelm Knapp, Halle a.S.

We have recently received Dr. J. M. Eder's valuable summary of the progress of photography in its various branches during the past year. In point of interest and likewise for careful selection of material recording new facts and technical improvements, the *Jahrbuch* for 1900 rivals any previous issue of the work. In this respect alone the volume renders an inestimable service, for which it merits the support of all who take more than a passing interest in photography. But, apart from the record of progress for the year, the volume contains a series of important contributions by leading writers upon photography, amongst whom may be mentioned, Messieurs Lumière and Seyewitz, J. Gaedcke, George Fritz, Professor E. Valenta, Dr. C. Grebe, Professor R. Abegg, Dr. Moritz von Rohr, Dr. R. E. Liesegang, Dr. R. Neuhauss, Dr. Kaempfer, L. Schrank, and Professor F. Schiffner. The illustrations at the end of the volume form a very interesting guide to the prevailing methods of photographic reproduction, and comprise some remarkable three-colour prints.

Studio Gossip.

THE AEROGRAPH—Mr. F. A. Verring sends the following note on this subject to the *English Mechanic*:—"Briefly stated, the 'Aero-graph' which used to be called the 'fountain air brush,' is an instrument of the appearance of an extra large-sized stilo pen. The pointed end is of plated metal, the top of which is cut away, and forms an open chamber in which liquid colour is placed. Working through this chamber, and above it, is a finger button attached to lever, which has two motions—an upward one, to open the air

valve underneath, to which is attached a small rubber tube from a compressed-air receptacle; and, secondly, a lateral movement which allows the operator to withdraw a silver needle running through the colour reservoir, and whose point fits into an opening in the nozzle of instrument, acting as a valve. Over this nozzle, and right at the point of instrument, is a small air chamber. As the finger button is pressed downwards, the air rushes into this chamber and out at the point of instrument. On pulling back the lever at the same time as pressing it, a very fine spray of colour is drawn into the air chamber by suction, and is projected through the point of the instrument in a very fine spray in the escaping current of air, the density of spray being regulated by the needle valve before described. The instrument is a valuable one in the hands of an artist. With it he can do his work more quickly, and obtain far better results. The liquid colour is sprayed on the paper or canvas: the manipulating of the two valves operated by the finger, together with the varying distances from his work the operator uses his instrument, allows him to obtain a fine finish, and the softest gradations between light and shadow, and a transparency in his shadows, which is only obtained without the aid of this instrument by much care, time, and skill. The compressed air for the supply of the Aero-graph or any kind of air brush is obtained from a specially constructed pump, which is generally supplied by the makers; but in large studios, where a number of Aero-graphs and other air brushes are used, a supply of compressed air is produced by specially constructed pumps, and stored in reservoirs at a pressure suitable for correct working of the instrument (from 16 lbs. to 18 lbs. per square inch). There are a great many artists in this country who much prefer an older air brush which is made in Rockford (Ill., U.S.A.). This 'brush' is scarcely so quick in use as the 'Aero-graph'; but, in the opinion of a number of workers, it is more satisfactory for producing the finest quality of work. The Aero-graph is now being manufactured in England, and is sold, together with foot pump and pressure gauge, for 7*l.* 7*s.* The 'Rockford' is about the same price."

News and Notes.

THE Waterloo and Blundellsands Photographic Society's Second Annual Exhibition of photographs, lantern slides, paintings, drawings, and designs, will be held in the Club Rooms, 65, St. John's-road, Waterloo, from Monday, November 19, to Saturday, 24, inclusive. Entry forms and all particulars may be obtained from Mr. Wm. G. Eyre, Hon. Exhibition Secretary, 2, Mersey-road, Blundellsands.

EXHIBITION OF AMERICAN PHOTOGRAPHS—An Exhibition of American photographs, comprising the work of all the leading pictorial photographers in the United States, will be opened on October 10, at the rooms of the Royal Photographic Society, 66, Russell-square, at eight p.m., when Mr. F. Holland Day will deliver an address. Admission, upon presentation of visiting card, also daily, between the hours of 10 a.m. and 4 p.m.

THE COLOR-PHOTO CO., of Birkbeck Bank-chambers, write: We regret that owing to light difficulties the proper means of showing our pictures at the Royal Photographic Society's Exhibition have not yet been satisfactorily solved, but we have reason to think that within the next few days the pictures will be shown in a way which will allow of their being judged on their merits. We shall be pleased to inform you when they have been so arranged.

"THE Alnwick and District Camera Club has recently been formed," say *Hurman's Photographic Chat*, "and promises to be an unqualified success. Mr. George Reavell is the Honorary Secretary, and under his energetic guidance, assisted by a committee of well-known amateur photographers, a capital programme of summer excursions was arranged. Enjoyable half-holiday excursions were made to Eglingham and Rothbury, others to Dunstanborough Castle, Bamborough, Howick, Edlingham, Warkworth, and places whose scenic charms are enhanced by their great historic interest."

ASHTON-UNDER-LYNE PHOTOGRAPHIC SOCIETY.—In consequence of the Triennial Exhibition in November, there will be no meetings for demonstrations, &c., during this month. Members are, however, requested to do all in their power to make the Exhibition as successful as in the past. It is also hoped that all members will endeavour to send some of their own work, either framed pictures, unframed pictures, lantern slides, or transparencies, so that we can have a good display of members' work. The Exhibition will be opened at 6 p.m. on Monday, November 12, and continue open during the rest of the week. Illustrated lectures will be given each evening after the opening night, and a musical programme rendered by an efficient Band.

AN OPEN EXHIBITION IN LONDON.—The Seventh Annual Photographic Exhibition of the Cripplegate Photographic Society and Essex and Middlesex Cycling Union, will be held at the Cripplegate Institute from November 7 to 10 next. Twenty-five gold, gold centre, and silver medals are offered for competition amongst photographers. Open Champion Classes have been arranged for (A) Pictures and (B) Lantern Slides, whilst the Ordinary Classes are (C) Portraiture, (D) Landscapes, (E) Architecture, (F) Beginners' Class, (G) Hand Camera and Cycling Subjects, and (H) Lantern Slides. Full particulars and entry form will be gladly sent on application by G. F. Sharp, 31, Sach-road, Upper Clapton, London, N.E., or A. T. Ward, Cripplegate Institute, Golden-lane, E.C.

PHOTOGRAPHY AT THE THORNTON HEATH POLYTECHNIC.—The Committee of this Institute call attention to a series of lectures which will be held on Thursday evenings from October 18, 1900, at 7.30, at the Thornton Heath Polytechnic. The Committee have secured the services of Mr. J. H. Gear, F.R.P.S., Honours Medallist, City and Guilds, Lecturer on Photography at the Regent-street Polytechnic and the Cripplegate Institute. The lectures will embrace the course laid down by the City and Guilds of London Institute,

including both practical and theoretical work, and are intended to enable students to obtain the certificate of that body. The course will consist of twenty-four lectures, and the fee, which includes use of apparatus, chemicals, and dark room, will be 7s. 6d. per student. The Secretary will be in attendance at the Polytechnic to receive entries every evening from September 17.

THE Sefton Park Photographic Society's Second Annual Exhibition will be held at the High Schools, Arundel-avenue, on Tuesday, Wednesday, Thursday, Friday, and Saturday, October 30 to November 3, 1900. The Judges are Messrs. F. Anyon, Paul Lange, George E. Thompson. The following are the Open Classes :—K, Landscape and Seascape, silver and bronze, 4 prints allowed in each set; L, Portraiture and Figure Studies, bronze, 4; M, Architecture, silver and bronze, 4; N, Hand-camera Work (camera must have been held in the hand during exposure), silver and bronze, 6; O, Lantern Slides, silver and bronze, 4; P, Champion Class. One print, any size, Landscape, Seascape, or Architecture. Open to prints which have gained an award at any Exhibition, silver and bronze, 4. In Classes N and O, complete sets must be sent in. Entry forms and fees only to be sent to Mr. George Birtwhistle, 7, Gainsborough-road, Sefton Park, Liverpool.

Commercial Intelligence.

Mr. ALFRED WATKINS informs us that he has purchased from Messrs. Field, of Birmingham, their connexion with the Watkins exposure meter, and that he proposes conducting the business at Hereford from November 1, under the style of the Watkins Meter Company.

DRY-PLATE MAKING IN AUSTRALIA.—The following notice from Messrs. Baker & Rouse appears in the *Australasian Photographic Review* for August : “ We take this opportunity to inform the trade throughout Australia that our Mr. Baker (now in England) has purchased a complete and up-to-date plant with the very latest appliances for the manufacture of dry plates in the Colonies. It is needless to say that every effort on the part of the firm will be made to turn out a high quality of plates. In the past we learned the great advantage it has been to procure fresh dry plates from the manufactory. We are safe in saying, when Mr. Baker was making plates some years ago they were acknowledged to be equal in every respect, if not superior, to any of the dry plates brought into the Colonial market, even to those of the present day. We can honestly say there are many leading photographers in Australia who can bear out this statement, for, when the Baker's specially rapid dry plate was enjoying its fame, there was no quicker, or clearer, or better gelatine plate to be met with in the Colonies. It will be our aim to give the Australian trade an equally fast and reliable plate at the moderate prices obtained to-day.”

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
9.....	Birmingham Photo. Society ...	Annual General Meeting.
9.....	Royal Photographic Society ...	{ Annual Address by the President, and Presentation of the Medals Awarded at the Exhibition.
10	Croydon Camera Club	{ Practical Instruction in the Use of the Platinotype Portrait Lamp. W. H. Smith.
10	Photographic Club	Photo-micrography. T. Charters White.
10.....	Redhill and District	{ Demonstration: Development. John Sterry.
10.....	Royal Photographic Society ...	{ Opening of Exhibition of American Photographs. Address by F. Holland Day.
10.....	Sefton Park	Competitive Lecturees.
11-13	Bootle	Seventh Annual Exhibition.
11.....	Liverpool Amateur	{ Lantern in Use for Testing Members' Slides.
11.....	London and Provincial	Open Night.
12	Borough Polytechnic	{ Practical Instruction: Plates—Speeds, Isochromatic, Double-coated, &c.
12.....	Croydon Microscopical	Prize Slides.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 2.—Technical Meeting,—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

APPARATUS AT THE EXHIBITION.

In accordance with the usual custom, the first meeting after the opening of the annual Exhibition, and of the winter session, was devoted to the demonstration and examination of the novelties in apparatus exhibited, most of which have already been fully described in previous issues of *THE BRITISH JOURNAL OF PHOTOGRAPHY*.

KODAK, LIMITED, exhibited the Panoram Kodak (for which the Society's medal has been awarded), the No. 3 Pocket Kodak, the Brownie, the No. 4 Cartridge, and the No. 1A Folding Pocket Kodak, and also a film-cutting board for facilitating cutting off exposed films for development, a contrivance which will be found very useful by all users of ro'lable films.

Messrs. DALLMEYER, LIMITED, showed an improved form of the Naturalist's tele-photo hand camera. The instrument as originally constructed met with a considerable amount of success, but was found to possess certain disadvantages which were now obviated. The new camera, instead of being a rigid box only suitable for lenses of a particular focal length, had a collapsible bellows body and a focussing arrangement, by means of which images of different sizes could be obtained. A specially constructed eyepiece, with a field including a circle of two inches in the middle of the quarter-plate image, had been substituted for the telescope by which the focus was originally ascertained. The camera shown was adapted for use with a tele-photo lens giving a magnification of about two diameters, or with positive lenses of any focal length down to about six inches.

Mr. SANGER SHEPHERD said that, from correspondence which he had had with many workers in three-colour and orthochromatic photography, there appeared to be considerable difficulty in finding the best place for fitting light filters, and in fitting the light filters. Practically, as long as the colour screen was placed between the sensitive plate and the object photographed, the exact position was not of much consequence; personally, he preferred to have it in front of the lens, because one could then always see whether a light filter was in position or not. He showed several pieces of apparatus for holding the screen, some as simple frames and others in the form of lens caps, &c., and for enabling the filters and plates to be changed rapidly and simultaneously.

Messrs. R. & J. BECK, LIMITED, exhibited the new folding No. 8 Frena camera, fitted with the Beck-Steinheil lens, with an aperture of f-6.3, and the aluminium “Wafer” shutter, which has already been noticed in these columns.

Messrs. W. WATSON & SONS showed a printing frame, designed by Dr. Barton, for printing from any portion of half-plate negative for stereoscopic work. They also described a new feature in their binocular stereoscopic camera, with which the pictures are taken from the side and not from the end of the apparatus; there had hitherto been some difficulty in ascertaining whether the camera was level, but this had now been obviated by means of a level reflected on to a mirror and into the eyepiece.

THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY showed the “Royal” Stereoscopic Hand Camera, taking either twelve stereoscopic pairs, or twenty-four single pictures, the size of each being 2½ inches by 2½ inches; Kodak and Frena cameras, with Goerz and Steinheil lenses; the Goerz Photo-stereo-binocular, combining an opera-glass magnifying two and a half times, a field-glass magnifying three and a half times, and a photographic camera for twenty-four single or twelve stereoscopic views, on plates measuring 1½ by 2½ inches, and other examples of their well-known instruments.

COMING EVENTS.

AN Ordinary Meeting will be held at the New Gallery, Regent-street, on Tuesday, October 9, at 8 p.m., when the President will deliver his Annual Address and present the medals awarded at the Exhibition. On Wednesday, October 10, at 66, Russell-square, at 8 p.m., Mr. F. Holland Day will open, with an address, an Exhibition of American Photographs. The collection will remain on view, during ordinary hours, until early in November.

LIVERPOOL AMATEUR PHOTOGRAPHIC SOCIETY.—September 27. Mr. J. H. Welch (President) occupied the chair.—Eight new Members were elected. Mr. WELCH, on behalf of the members, presented Mr. F. A. Schierwater, the Hon. Secretary, on the occasion of his marriage, with a handsome solid oak cabinet sideboard and silver rose bowl. He spoke in glowing terms of the admirable services the recipient had rendered to the Society during the seven years he had undertaken the duties of Hon. Secretary. Mr. SCHIERWATER suitably replied. The lecture set down for the evening was by Mr. FRED CLIBBORN, on

THE LOIRE AND THE ROYAL CHATAEUX OF TOURNAINE.

Mr. Clibborn handled his subject in a very masterly and at the same time amusing manner, and the interest of the audience was well maintained throughout. The lantern illustrations were of a very high-class character, and did much to enhance the pleasure of the evening.

FORTHCOMING EXHIBITIONS.

1900.	
October 5-Nov. 3	... Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
,, 5-Nov. 3	... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square W.C.
,, 17-20	..... Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.
November 7-10	..... Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. The Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
,, 12-17	..... Ashton-under-Lyne.
,, 21-23	..... Hackney Photographic Society.
,, 22-24	..... Hove Camera Club. Hon. Secretary, C. Berington-Stoner, 24, Holland-road, Hove.

1901.
January 14-19 Blairgowrie and District Photographic Association.
The Hon. Secretaries, Blairgowrie, N.B.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

Patent News.

The following applications for Patents were made between September 17 and September 22, 1900:—

PRINTING FRAMES.—No. 16,689. "Improvements in Photographic Printing Frames." L. HOLLAND.

CASES-CARRIERS.—No. 16,758. "Improvements in, and relating to, the Carrying and Exposing in the Camera of Photographic Sensitive Films." J. FLECK.

AMERAS.—No. 16,802. "Improvements in Multiplying Cameras." Complete specification. J. SCHAUB.

ARTIFICIAL LIGHT.—No. 16,804. "Improvements in Apparatus for the Photographic Copying of Drawings and the like with Artificial Light." J. L. DAVIES.

MASURING NEGATIVES.—No. 16,813. "Improvements in Apparatus for Ascertaining the Colour and Density of Photographic Negatives." J. W. DAWSON.

STAMP PHOTOGRAPHY.—No. 16,919. "Improvements in Stamp Photography." Complete specification. H. LANDAUER and E. HACKH.

Correspondence.

* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* We do not undertake responsibility for the opinions expressed by our correspondents.

THE TRADERS IN POISONS OR POISONOUS COMPOUNDS FOR TECHNICAL PURPOSES PROTECTION SOCIETY.

To the Editors.

THE SALE OF POISONS AND THE GENERAL ELECTION.

GENTLEMEN,—The following is a question which my Society is forwarding to be answered by each candidate at the coming General election.

"Are you prepared to support a Bill in Parliament making it legal that chemical compounds (although containing poisons), which are not or medicinal use nor intended for the preparation of medicine, may be sold by traders such as agricultural agents, seedsmen, nurserymen, iron dealers, iron and hardware dealers, and other tradesmen (including pharmacists) for any trade or technical purpose, in original sealed packages as received from the wholesale dealer or manufacturer?"

I trust that your readers who are interested in the subject will use their best endeavours to also bring the question to the front.—I am, yours, &c., T. G. DOBBS.

5, Clements-inn, Strand, London, W.C., September 26, 1900.

PICTORIAL PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—There is an old saying, "When doctors differ, who shall decide?" One cannot be long interested in the photographic world before becoming acquainted with the fact that there are what might be described as photographic schools, particularly in the region of what is known as pictorial photography. There is certainly a good deal of inconsistency as to what constitutes a pictorial photograph, also as to the methods which may be legitimately pursued in the production of a pictorial photograph. You, at any rate, have never hesitated to express your opinion concerning some of the photographs which claim to possess artistic qualities, and some of your remarks on the works at the Salon are emphatic enough, in all conscience.

There comes a time in the affairs of many indiscriminate snap-shotters when they possess a desire to pursue photography somewhat more seriously than has been their wont; but, as I have remarked, there

appear to be great differences of opinion as to what constitutes a serious photographic production, so that they may well ask, "When doctors differ, who shall decide?"—I am, yours, &c.,
Cutcliffe-grove, Bedford, October 1, 1900.

J. A. REID.

COMPRESSED PYRO.

To the Editors.

GENTLEMEN,—We forward for you to try a sample of Messrs. Johnson & Sons new pyro preparation. It is a *very pure pyro* put up in a delightfully portable form; half a pound of it could easily be carried in one's pocket, yet it dissolves as quickly as the bulky flocculent crystals, and is in no way injured by the process of compression. Trusting to have a favourable report,—I am, yours, &c., G. WATMOUGH WEBSTER,
Managing Director Sepac Company.

33, Bridge-street-row, Chester, October 2, 1900.

[The sample of pyro sent is in compressed form, and it packs into a card box $2\frac{3}{4}$ inches in diameter, and half an inch deep. In use the pyro does not appear to be affected by the compression; it easily flakes off in the cake, is freely soluble, while its reducing properties in development are all that can be required. No more convenient way of sending out "our old friend pyro" could have been hit on. E.D.S.]

INTENSIFICATION TROUBLES.

To the Editors.

GENTLEMEN,—It is many years since I had a case similar to that referred to under the above heading (THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 624) in the days when dry plates were *not* to be depended on. I forget the conditions prevailing at the time, and I have no doubt the reticulated film was allowed to disappear down the sink; but, were such a case to crop up now, I think I should make an attempt to entirely "remove the film," using an acid solution (1 part acid hydrochloric to 7 parts of water), which I have invariably found effective, then to soak and wash the film and intensify *de novo*. Probably this suggestion is too late for the case referred to by your correspondent, as, if such a negative be allowed to dry, I imagine the reticulations would show on removal as slightly (but fatally) denser markings.—I am, yours, &c.,
October 2, 1900.

J. PIKE.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24 Wellington-street Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

G. Denney, 21, Sidwell-street, Exeter.—Photograph of Sir Edgar Vincent, K.C.B.
W. Morrison, 11, St. James-street, Nottingham.—Photograph of Lord Henry Bentinck.
A. C. Price, Royal Victoria Studio, St. Leonards-on-Sea.—Two photographs of child lying on cushion.
J. Tyson, 10, Alwyn-road, Fallowfield, Manchester.—Six photographs of the G.P.O. fire, Manchester.
W. H. Warburton, Harris Promenade, Douglas, Isle of Man.—Three photographs of Madame Lucile Hill. Five photographs of D. S. S. Moore.
W. Harrison, Holly Bank, Onchan, Isle of Man.—Photograph of the Hall at Bishop Court, Isle of Man. Photograph of Bishop Sodor in his Study at Bishop Court.
A. J. Ashbolt, 29, High-street, Southampton.—Photograph of group of the Southampton Club football players. Photograph of A. Molyneux. Photograph of Mr. Blackburn. Photograph of B. Sharp.

W. THOMPSON.—For street stereoscopic work we should prefer lenses of five-inches focus.

A. GREENWOOD.—The oxymagnesium light of the Platinotype Company would, no doubt, suit your requirements. We recommend you to write the Company for particulars.

FORMULA WANTED.—ALPHA writes for a good formula for a combined toning and fixing solution.—Formulas for combined toning and fixing bath, are given on pages 1073 and 1074 of the ALMANAC for the current years and they are good ones.

THE THORNTON POSITIVE FILM.—J. H. Baker writes: "Can you tell me where to get J. E. Thornton and C. F. S. Rothwell's patent photographic film for producing positives direct on the camera from, or give me the address of the gentleman mentioned?"—In reply: Address the Thornton Film Company, Altringham, Cheshire.

BOOKS ON STUDIO CONSTRUCTION.—G. S. asks for names of the best books published on Studio Construction and lighting and posing.—In reply: Mr. H. P. Robinson's *Studio and What to do in it*, published by Sampson Low & Co., Fetter-lane; and *Studio Construction*, by Mr. Bolas, published by Marion & Co., Soho-square, W.

PARTNERSHIP AGREEMENT.—W. W. says: "I am about entering into a partnership with my brother-in-law, in the purchase of a photographic business. The agreements are drawn out by ourselves. Can you tell me if it is necessary that they should be stamped? and, if so, should both be stamped?"—Yes, they should both be stamped or they will not be valid.

THINNING COLLODION.—S. WALTERS.—The enamel collodion that has got thick by keeping may be thinned with equal parts of ether and alcohol; but, as the ether has probably evaporated in a greater proportion than the alcohol, it will be better to use, say, six parts of ether to four of alcohol. Methylated alcohol will do provided its specific gravity does not exceed .820.

THICK BROMIDE CARDS.—H. J. J. writes: "Could you give me the address of a firm where I could obtain thick bromide card? I should like it about as thick as an ordinary cabinet mount?"—Messrs. Griffin & Sons supply a very thick bromide paper or card. Some other firms do the same, but whether any as thick as that mentioned is made we do not know. If it were, we should imagine it would be somewhat difficult to manipulate.

SHUTTERS.—SHUTTER asks: "What kind of shutter do you regard as the best for all-round work, and why? What are the advantages or otherwise of fixing the shutter (a) before, (b) behind, and (c) between the combinations?"—All the shutters now on the market are good. Perhaps the form more generally used is the "roller blind," a, b, c: Advantages are claimed for each position, but in actual practice there is very little difference in the results obtained.

THE PHOTOGRAPHIC ERA.—LENS writes: "Could you oblige me with the name and publishers of the *Photographic Era*, mentioned in your issue of September 21, on p. 603, in the "Making of the Lens," and the date of same from which the quotation is made, as I cannot obtain it from Smith & Son?"—The *Photographic Era* is published at Boston, U.S.A. The September number, from which our quotation was taken, may, no doubt, be obtained by order of Messrs. Dawbarn & Ward, 6, Farringdon-avenue, E.C.

AGREEMENT FOR THE SEASON.—OPERATOR writes: "I made an agreement with Messrs. —— for the season, no definite time was mentioned. I have just received notice that I shall not be required after the end of this month. I commenced on August 1. Ought I not to go on till the end of October. What is considered the season?"—The "season" is a very indefinite term and may mean anything. In making such agreements a definite time should be stated. At some places "the season" is very short, at others it is longer. As you are only a weekly servant, we expect you will have to take the week's notice.

EMPLOYMENT IN AMERICA.—H. B. T. asks: "1. Is there any weekly published in America like your *BRITISH JOURNAL OF PHOTOGRAPHY* obtainable in England, and where? 2. Is there any chance of earning a good living at photography in America? 3. If so, can you advise how to get a situation? 4. About what salary do they earn?"—In reply: 1. Perhaps *Wilson's Photographic Magazine*, obtainable, on order, from Messrs. Dawbarn & Ward, Farringdon-avenue, might suit your purpose. 2, 3, and 4. Upon these matters we can give no first-hand information; but we should say all would depend upon your ability and experience.

PHOTOGRAPHING BRIGHT OBJECTS.—C. STUART writes: "I have some silver cups, vases, &c., to photograph. Would you please inform me what is best to be done to them previous to photographing, what preparation is put on to prevent glare or halation?"—There are different ways of dulling the surface of the metal. One is to dab it over with a ball of common glazier's putty. Another is to have the studio warm, and then introduce into the vessels a lump of ice. That will cause the moisture in the room to condense on the metal, and thus dull its surface. Both methods are good. The plates should be backed to prevent halation.

URANIUM TONING.—ENLARGER writes: "Can you oblige me with a uranium toning bath for bromide prints and opals? Will the uranium salts deteriorate if kept in a ten per cent. solution, and can any alteration in tone in mixing different quantities of ferricyanide and uranium be obtained, as the tone I require is a rich brown—as near a carbon as possible—and not the usual rank sepia tint?"—Two short articles on uranium toning are given on pp. 962 and 963. In these you will find directions for obtaining a great variety of colours. We prefer to use the solutions tolerably fresh; they will not, however, keep at their best for a long time.

LENS FOG.—C. GODFREY writes: "Will you kindly tell me the cause of fog in centre of enclosed picture? Two other negatives taken at the same time are similar. The sun was shining slightly at the time of exposure, but I shaded the lens by standing the right side of it. The lens is a single one, the iris diaphragm is slightly bright with wear, a small aperture was used."—The fog is caused by a flare spot from the lens, and probably enhanced by the bright edges of the diaphragm. Altering the position of the stop will often avoid it. Place the stop a little further from, or nearer to, the lens and see the effect. Also blacken the diaphragm afresh.

RAPID DEVELOPMENT.—C. HAMLIN. If you can make a developer that will bring out the image, with full density, in twenty seconds, where is the advantage of it in practice? With such an energetic developer it is so easy to go wrong, for with a second or two, more or less, too little or too much, density may be obtained, and what might otherwise have been a good negative spoilt.

TWENTY-FOUR PHOTOGRAPHS ON A PLATE.—L. MARTIN writes: "Can you inform me where I can purchase printing frame for about twenty-four small photographs on half-plate bromide paper? I have tried several firms, and they recommend the Gem or Victoria Camera, but I have seen them printed from one head or figure."—In reply: Perhaps Klay's multiplying plate-holder may meet our correspondent's requirements. Write for particulars to the agent, Mr. G. Jobson, Adin Villas, Boston-road, Horncastle.

CYANOTYPE LANTERN SLIDES.—IN NUBIBUS asks: "Can you give me a formula for the production of ferro-prussiate or cyanotype lantern slides? Can ordinary lantern slides be treated to produce the result, or must they be independently coated with a special emulsion? In the latter case, can they be procured through any trade channel?"—Ferro-prussiate lantern plates are not articles of commerce, and we know of no method of getting the same results on ordinary lantern plates. Blue slides can be produced by the carbon process, using a blue tissue. Several pages in the ALMANAC are devoted to the ferro-prussiate process; possibly from them you will be able to prepare plates for yourself.

MYSTERIOUS CASES OF FOG.—REX asks: "Can you please help me to find out the cause of apparent fog on the waste negative enclosed herewith? These marks have been annoying me ever since my commencement in business, but they do not always appear to the same extent, and sometimes not at all. I thought it must be from reflected light, so I had two rods fitted to the camera, thereby enabling me to draw the cloth more over and shade the lens, but this did not avail. There is nothing inside the camera that would be likely to reflect, everything being quite black."—The "fog" appears to be a secondary image produced by a minute hole in the camera, either in the front or in the bellows, which has acted as a "pin hole camera." In the negative sent, a figure in light hat can be traced.

CONVERSION OF FORMULE.—VACUUM CAPUT writes: "Not understanding the following, will you please give it me in English weight and measure? I.—Pyrocatechin, 7 grammes; hydrate of potash, 6 grammes; crystallised sulphite soda, 30 grammes; water, 75 grammes. II.—Concentrated developer, 10 c.c.; soda-fixing solution, 1 to 5*, 20 c.c.; water, 20 c.c. See soda-fixing solution marked thus *, please explain this; what is 1 to 5, and should the solution be 3 ounces of hypo to the pint? From p. 861 of BRITISH JOURNAL ALMANAC."—If you turn to pp. 548-60, also pp. 990-91 of the ALMANAC, from which you got the formula, you will find tables of the metric system and the equivalents in the English system. By 1 to 5, one part of hyposulphite of soda to five parts of water is meant—equal to 4 ounces to the pint.

CARBON PRINTING.—G. & J. HALL write: "We have been doing a little carbon printing of late, and in every case we have been troubled with a slight veil or fog over the prints which will not develop away. The sensitising and drying is done in the dark room, and we are very careful in every way. Could you suggest a cause or remedy?"—The tissue is tinted, that is, it has a slight insoluble layer on its surface. This may be caused in different ways. Too slow drying may cause it; exposure to the fumes of burning gas will also produce it. As a rule, an ordinary dark room is not a good place wherein to dry sensitised carbon tissue. We should advise you, after sensitising the tissue, to squeegee it on to a ferrotype or glass plate, and allow it to dry on that. The surface will then be protected against any noxious fumes.

STUDIO-BUILDING.—NEW STUDIO writes: "I am about to build a new studio. The only available "square" space is about 20 x 13 feet, but I can have an extension of about 12 x 6 feet or so wide for long focus when taking groups. The only available light is about E.N.E. I intend making the studio on H. P. Robinson's plan, as sketch, not made to scale, the glass to run the whole twenty feet length of studio proper (or eighteen feet of it). With regard to the glass, my pocket tells me I must economise. I am told that glass plates about 14 x 12 inches to cover the area of 180 feet will come very much cheaper than larger sheets sufficient to cover the same area. My idea, as a former studio worker, is to have the sheets at least 16 x 30 inches, in order to prevent so much overlapping and so many bars of wood to reduce the light. My brother, who is helping me with the needful towards the erection, thinks that the smaller sheets will answer just as well. I may say here that he knows absolutely nothing about photography. What I want you, with your usual kindness, to decide for our satisfaction is whether the smaller panes would be practicable or not. Mr. Robinson does not give any idea at all as to the size of each pane of glass. I shall so arrange matters that I can use both ends of the studio proper, a bust or three-quarter cabinet, &c., but for, say, full figure or group can only use the S.S.E. end, as the narrow extension before mentioned will be at the opposite end. Kindly give me a few hints regarding the colour of blinds and the width of same for the given light and form of studio. I think white or cream, with supplementary dark blinds, at each end at least, all to run to the ridge by means of spring rollers."—The larger size glass will be decidedly preferable, as there will be fewer laps to let in water and dust. 14 x 12 is certainly small for glazing a studio with, and, with that size more sash bars will be necessary than with the larger size. We should prefer the blinds to be light green or dark blue, then, with that aspect one set of blinds will suffice, except, perhaps, a darker one at either end. About four blinds for the roof will answer.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

The ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulae will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages for the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their M.S., sketches, &c., in the course of this month.

We shall be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c.

As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us at once.

* * * The publishers ask us to remind advertisers that most of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them immediately.

* * * Will secretaries of societies who have not yet sent us lists of officers for inclusion in the ALMANAC kindly oblige us by doing so by return in order that this section of the book may be proceeded with.

EX CATHEDRÀ.

An excellent suggestion for promoting the use of the metric system amongst photographers reaches us from an esteemed correspondent. He writes:—"I would suggest that the teachers of photography should be especially appealed to. There are several large schools for teaching where much might be done to encourage the use of metric units, laying especial weight on their definiteness in comparison with the doubts often raised by the present system. Take the ounce. Photographers often mean the ounce of 480 grains: now one by which no dealings are legal save in precious metals. Then the drachm is in weight 30 grains: in measure 60 minims [an ounce weight is legally 16 drachms, whereas an ounce measure is only 8], and (I speak from experience) there is often a doubt as to what is meant. The question, of course, is not whether the speaker or writer knows his own meaning, but what he conveys to others. Even if the pupils of a school are without doubt as to the meaning there, they are liable to mistake when working on their own account, and reading as, of course, they should do in order to keep up with increases of knowledge." The photographic classes at the various polytechnics in London, to the number of some eight or ten, have just commenced their course of winter work, and thus the suggestion of our correspondent comes in excellent time for its adoption by the various teachers.

AT this time of year we receive from the secretaries of photographic societies many lists of winter fixtures. There are some peculiarities about these compilations that call for one or two observations. In the first place it is only too apparent that the benign virtue of self-reliance is not cultivated by photographic societies so much as it might be. It is outside help that the majority of them look for assistance in filling their evening bills. Of the many fixture-cards that have lately passed under our observation not more than two or three exclusively bear the names of members as readers of papers. Trade demonstrators are "starred" with the greatest frequency on those cards. Then, in London, the forty odd societies of the great city and its suburbs make the greatest possible use of a handful of clever amateur photographers who have become specialistic in some particular branch of work. The man who attacks an uncommon or novel aspect of photography, and in a moment of unreflective enthusiasm reads a paper descriptive of what he has done before some society is swiftly pounced upon by the rapacious secretaries of other organisations, who make his life a burden with requests to favour them with repetitions of his lecture or paper. But, in addition to trade demonstrators and prominent photographers society secretaries have an unpleasant habit of levying toll upon another class of people. Those persistent and misguided gentlemen appear to think that a modern photographic journalist should occupy his few leisure evenings in travelling to more or less remote places and delivering discourses on photography to small audiences of languid amateurs, who must be satiated with the printed literature of photography.

* * *

It has always been a mystery to us why the members of the photographic press—as busy a band of workers as you may find in the field of London journalism—should be taxed and importuned in this manner. For ourselves, if we gave way to half the requests to read papers that constantly reach us our free evenings between October and June would be rarities. Home would become a thing in name only. In the course of a quarter of a century's association with journalism of various kinds, we have not come across any cases parallel to this. The conductors of journals appealing to particular classes, with the exception of photography, are not badgered in this manner, or at any rate to nothing like the same extent. Fancy the Editors of "The Lancet," or "The Gardeners' Chronicle," or "The Engineer," being persistently dunne by the secretaries of medical, horticultural, or engineering societies to live laborious nights in lecturing to small organisations on their "favourite hobbies." However, our point in all this is that self-help should be a cardinal feature in photographic society work. Outside assistance can only be relied on for a comparatively short time, and, when withdrawn, experience has over and over again shown that a resourceless society which has failed to develop the abilities and knowledge of its own members sinks slowly but surely into oblivion.

* * *

As we lift the pen from writing the previous paragraph we see at our side a post-card, sent us by a friend, which is circulated amongst the members of the Toronto Camera Club. Under the October list of fixtures the "Secretary-Treasurer"

prints the following series of bright, little hints to his members:

P. S. The above bill of fare, rich, varied, &c though it is, may probably be augmented by a dish of brain food of a new brand. The date can not yet be determined, therefore members should make a point of attending regularly and not miss any extra items. The Committee is most pleased to heliograph that it has other things up its executive sleeve besides its executive arm.

P. P. S. The demonstrations above announced, and which are for the benefit of our less experienced members, will, it is hoped, prove popular. Those who have not yet made slides will be encouraged to get their skates on and break the ice.

NEW MEMBERS. All applications for membership should be forwarded at once to the Secretary. The vacancies will be very few. To avoid the crowd, come early and bring the exact amount with application.

GETTING A BIG BOY NOW. Our Tenth Annual Exhibition will be held December 11th to 15th, 1900. To encourage our members to exhibit, please note that this will be a purely photographic exhibition, a heretofore. The rumour of peanut stands and side shows is entirely without foundation.

AUTUMNAL RAIN. A heavy down-pour of "fives" is expected by the Secretary-Treasurer early this month.

The author of these perky reminders is evidently a very "live" official indeed, laudably anxious to keep his members together, and not afraid to select slightly unconventional methods of arousing and sustaining their interest in the affairs of the Club. If some of the lethargic secretaries of English societies infused a little more go into their administrative methods we should perhaps hear fewer complaints of poorly attended meetings and the decay of enthusiasm for photography, which so surely follows the withdrawal of incentives to continue its practice.

* * *

Dr. Kime, in "The Scientific American," of September 29 describes and illustrates some decidedly attractive and, so far as we are aware, novel experiments in testing the penetrative quality of light by means of photography. He remarks that he has been able to demonstrate that the actinic rays of the sun, when sufficiently concentrated, may be made to pass through the thorax of an adult, from front to back, with sufficient intensity to reproduce a picture upon an ordinary photographic dry plate. The doctor describes the method of procedure as follows: The person on whom the experiments were to be made was taken into the photographer's dark room and the plates were applied with great care, that all rays of light save those that traversed the thorax might be excluded. The direct rays of the sun falling upon the reflector through the skylight are focussed upon the chest of the person upon whose back has been placed the sensitised plate on which the picture is to be taken. A transparency on glass of a valley in the Klondike was used as the original from which the picture was to be made. This was fastened to the sensitised plate, and the two were placed on the back between the scapulae of a man weighing 150 pounds, the transparency being placed next to the body with the new plate immediately behind it. Over these were placed black paper, black cotton wadding, several large black cloths, and over this his coat was drawn and all were securely fastened by means of long black bandages. He was the

aken to the light room, and the reflector was turned upon the chest for fifteen minutes. After exposure he was again taken to the dark room and the plates were removed, and the illustration [a small view is reproduced in our contemporary] was developed on the photographic plate. In producing the picture all sources of error were carefully excluded, and the operation was repeated many times on various persons, and always with like results.

* * *

ANTICIPATING any suggestion that some agency other than transmitted sunlight might have influenced the sensitive plate, Dr. Kime adds that in order to further test the reliability of the procedure, and to insure that the picture was not produced by contact of the transparency with the body, aided by the body heat or by some undetermined influence other than the light transmitted through the body, subjects were arranged in the same manner and for like periods of time, without attempting to pass the light through the body, and no picture developed on the plate. The conclusions of the experimentalist are that the photographs establish the fact that the actinic rays of the sun, when sufficiently concentrated, may be made to pass entirely through the body of a full-grown man. He points out that the rays of light pass through the integument with considerable difficulty, more readily through muscular tissue, and much more readily through bone. In producing a picture through one cheek the light passes through but a single thickness of the skin, and the picture is reproduced almost instantly. Finally, Dr. Kime says that the reflector used in making the experiments is a compound circular mirror, 30 inches in diameter, and is overlaid with blue glass. It is so constructed that all the light which falls upon it is focused upon a spot 6 inches in diameter at a distance of 8 feet in front of it. In concluding his account of the experiments, Dr. Kime points out that light has been applied to the treatment of diseases of the skin, but it has not been supposed that it would penetrate any distance into the body. It should not be a difficult thing to repeat Dr. Kime's experiments. If they are verified the weakness of the sunlight at this time of year would necessarily entail very long exposures—a curious addition to the numerous phenomena of light transference and transmission will have been made.

BLUE PRINTERS' APPLIANCES.

HE photographic reproduction of drawings and tracings, albeit by processes which are as old almost as photography itself, is a department with which professional and amateur alike are very slightly acquainted. Nevertheless, it is of considerable industrial importance, and a by no means insignificant number of hands are employed mostly in large engineering works in working these "blue-line" and "black-line" processes. In this country the existence of an independent blue printing establishment, to draw its custom from local engineers, architects, clerks of works, surveyors, and estate agents, and others requiring plans of any kind multiplied on a limited scale, does not appear to have occurred to any of the photographic craft, although on the Continent the sign "Licht-pans Anstalt" is frequently to be observed in large manufacturing towns—the outward and visible sign that within one may obtain heliographic prints at short notice. We drew our readers' attention to the pos-

sible business in this direction some months ago, but we have not heard of any one setting up.

However, this may be, we take it that blue printers, wherever they may be, are numbered amongst our readers, and will therefore be interested in one or two of the later developments in the craft which have come under our notice. The first is of special interest to those in charge of a blue print house in a large factory in which the difficulty of obtaining a suitable and sufficient printing area is often keenly felt, par-

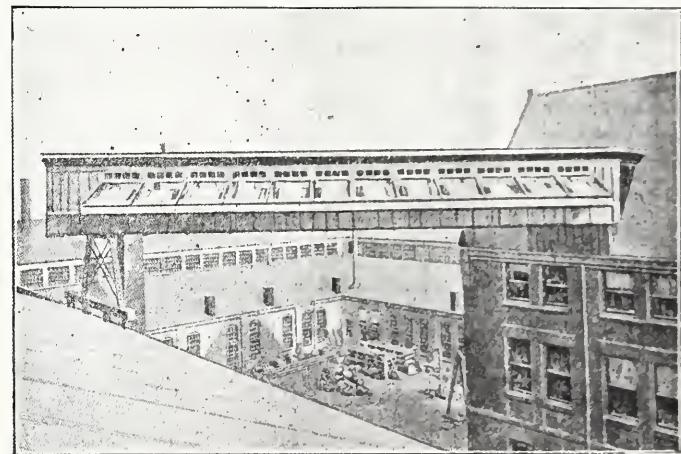


FIG. 1.—South side of Blue Print Gallery.

ticularly in premises within the metropolitan district. As showing how such difficulties can be overcome, we give below a description of a blue printing establishment erected by the Brown Hoisting and Conveying Machine Co., Cleveland, Ohio, for which we are indebted to "The American Machinist." The half-tones which illustrate our remarks are copied from the half-tone reproductions of the photographs of the originals. The rectangular lines of the factory ran at almost exactly 45° to the cardinal points of the

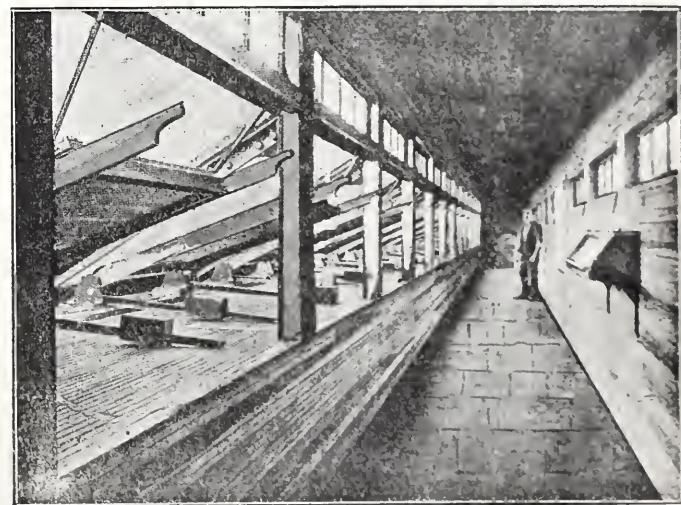


FIG. 2.—Blue Print Gallery (inside).

compass, so that a direct southern aspect from any of the windows was impossible. A gallery, as shown in fig. 1, was therefore constructed from a corner of the block in which the drawing office was situated to the roof of an opposite shop. This gallery runs due east and west, and accommodates 12 printing frames, each taking a sheet of paper 36 by 24 inches.

"The slanting roof of the gallery (see fig. 2) is composed of sheets of plate glass much larger than the printing frames,

and covering the entire spaces between the oblique steel angle beams. This affords a perfect protection from rain, and allows the printing to be carried on in all weathers. The spaces between the large printing frames are used for small tracings, and about fifty 9 by 12 prints can be printed here.

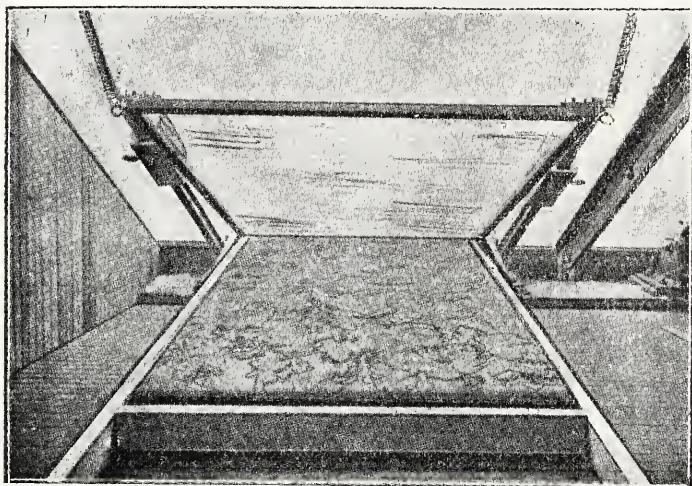


FIG. 3.—One of the Printing Frames.

No frames are used for these, merely a pad of blotting-paper, and then a plate of glass over the tracing, the weight of the glass being sufficient to hold the tracing.

"The arrangement of the large frames will be understood from figs. 2 and 3. The wooden frames are balanced in any

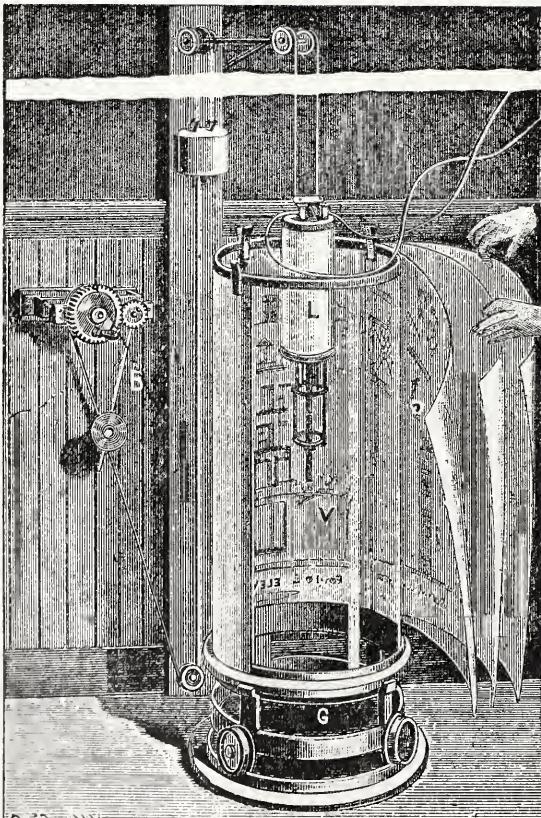


FIG. 4.—Apparatus for Printing Working Drawings. From a Drawing in *La Nature*.

position by a system of levers and counterweights. These as well as the iron frames for the glass, are hinged at the outer end, and at the inner end there are springs which relieve the glass from shocks, stop the frames at a certain point, and allow the wooden frame to drop away and relieve the tracing.

The tracing and blue-print paper are laid upon the carpet padded surface, and the wooden frame is then raised until the glass and the iron frame are reached. The two frames are now nearly parallel, and as the motion continues the entire weight of the glass and its iron frame is thrown upon the tracing. In good light the twelve frames will turn out a print each every minute."

The second appliance we describe is for printing large tracings by artificial light. The arrangement, we learn, is of English manufacture, and is patented, though from the reports we see is received with greater favour on the Continent than here.

The apparatus (fig. 4) consists of two semi-circular sheet of thick glass mounted in a cylindrical frame, which rest upon a base (G in figure) with which it can rotate by means of the three small wheels attached to the latter. The tracing to be reproduced is first placed round the outside of the glass surface, the sensitive paper laid over it, and the two draw into contact by a cloth wrapping, which is placed on and fastened with buckles. An arc lamp is now suspended over the interior. It is connected with a simple mechanism whereby it acts as the motive power for slowly rotating the cylinder as it descends. Everything being in readiness for the exposure, a pendulum is released, and the lamp commences its downward journey, the motion of the print around it securing an even illumination. The speed of the lamp can be adjusted to suit tracings of different opacity or paper differing in sensitiveness. With a lamp of 10 amperes and 120 volts, forty prints (30 by 40) can, it is stated, be made per hour.

Acetylene Purification.—This topic, which has often claimed our attention, has too practical a bearing to be lost sight of, and the method adopted by the Hungarian street railway seems to meet almost all requirements. Formerly acetylene supply works chloride of lime was the agent employed; but there is now used with this material sodium plumbate containing an excess of alkali. It is stated that, when the chloride alone is used, there is danger of explosion through liberation of chlorine. A purifier charged with the new mixture was opened after ten hours' working. When the upper grating covered with lime was removed, spontaneous combustion ensued, and a long flame rose from the apparatus but no explosion occurred. The conclusion was drawn from these results that the new mixture might be looked upon as free from danger.

Algin.—This is a gelatine-like substance of which we shall probably hear more, and which may be found useful for many purposes in photography. It is made from seaweed which is steeped for a day in a solution of carbonate of soda, the product being a mass with extraordinary viscosity—fourteen times that of starch, and thirty-seven times that of gum. This mass is cellulose, with a large amount of the gelatinous constituent, which has received the name of algin, and can be stored for a length of time without change. The pressed-out gelatinous mass is made into cakes resembling cheese, and can be used for a great variety of purposes. The cellulose left behind after pressing out the algin is also a valuable product, and is capable of being turned and shaped like celluloid, and of receiving a high polish. It also makes an excellent paper—tough, transparent, and fibreless. These qualities should mark it out as a very desirable, if not, indeed, already chosen, substitute for celluloid for films, and, the source being almost inexhaustible, it would have the merit of probably stability of cost, unlike cellulose, the price of which, through the rise in camphor, is greatly increased over that of a few years ago.

The Coagulation of Albumen.—Many years, perhaps a quarter of a century ago, the literature of albumen was very copious

but of late years gelatine has taken its place. Here we have another example to add to the perpetually expanding list of decay of English in favour of foreign manufactures. It is within the memory of the older generation of photographers that the best albumenised paper in the world was made in England—there were several eminent makers; any from abroad was foul-smelling and inferior. What is the present position of the trade? Virtually it all is "made in Germany." There are other highly prosperous photographic trades for which this country is pre-eminent for excellence; yet already a start has been made in Germany to supplant them. So far the opposition is negligible and our trade is not touched; but, if the English manufacturers think that the foreign makers will rest, they will make a woful mistake. They can do as they please now; but we advise them to take warning by the trade referred to above, to the state of the coal-tar dye trade, to the mount manufacture trade, to the paper trade, to the pyrogallic acid trade, &c., in all of which once this country was pre-eminent. We have rather digressed from our purpose which was to refer to a paper by J. Bretland Farrar, recently read at the Royal Society upon the effect of heat on various forms of albumen. It would appear that even for the same type of albumen the coagulation temperature is not constant. A sample from fresh-laid hen eggs became opalescent at 60° and insoluble at 64°, while with another sample the figures were 65·5° and 68°. In the new experiments dry albumen was used: it was dissolved in water, which it did readily, and gave 60° and 62–63°. Heated before solution for two or three hours it became coagulated at 80°; but if any contained moisture be driven off at a gentle heat to 52 to 55° it could be heated to 102–110° without undergoing any change. It can be readily understood from these data how easy it is for the albumen used upon paper to vary in its conditions of coagulability, the manner of which and the time needed for it being potent factors in the production of good tones.

Low Prices for Stereoscopic Prints.—A correspondent writes us that he was sufficiently interested in our last ALMANAC article to take up stereoscopic photography. He had a special camera made to order, and secured about ninety views in a picturesque part of the country, which he thinks are as good as any he has seen. Some of the slides have been sent us, and they are somewhat pleasing. But our correspondent was disappointed with the results of his attempt to sell his prints to a publishing house. He asked four shillings per dozen, and could only obtain half that price. Naturally he is somewhat disheartened at his first endeavours to make money out of stereoscopic photography. Two shillings a dozen for stereoscopic prints is a ridiculously small price, but it must be remembered that a publisher buys prints to sell again. Our correspondent, who spent 30/- on his apparatus, says: "I trust you will pardon me writing, my only excuse being to give you some idea of my experience in stereo work, and the poor look-out for any one who might possibly take it up as a means of earning their bread and cheese; there seems no public interest in it whatever, and no inducement to turn out decent work." We are sorry at our correspondent's failure; but we have never glossed over the undoubted fact that in these days, for money to be made out of stereoscopic photography, it must be undertaken on a very large scale. The mere selling of prints from a few negatives offers few chances of financial success rewarding one's efforts.

NOTE ON THE LIPPmann PROCESS.

WORKERS in this process, especially in cases where mixed colours are dealt with, will do well to note Professor Lippmann's recent advance in the matter of isochromatising his plates, an advance not mentioned at all in the latest British handbook (Marion's) which touches on the practice of his fascinating method.

This advance consists in replacing the usual dyes (cyanine, quinoline red, &c.) with a solution of *crystallised* methyl violet (one per cent.) in pure alcohol. A plate, to all intents and purposes panchromatic, results, and reds, greens, and yellows appear with striking fidelity and brilliancy along with the blues in the finished helio-

chrome. In a recent number of the JOURNAL an account was given of Dr. Luppo Cramer's experiments, and the opinion expressed that, in the case of the fine-grain (it is *not* grainless) Lippmann plate, the range of sensitiveness runs further towards the red end of the spectrum than in the case of ordinary plates sensitised with the like dyes. This holds true of plates dyed with methyl violet, which does not seem to sensitise beyond the orange in the case of ordinary emulsions, but, nevertheless, suffices for the registration of rich and deep red in the Lippmann procedure. Two and a half c. c. of the solution to 100 c. c. of emulsion is the quantity that Professor Lippmann favours. His recent results are far the finest.

To turn to another quarter, there is a very curious modification of the usual procedure to be noted. Personally I never succeeded to any satisfactory extent until I hit upon it, the colours being usually too feeble to be of any value. On one occasion, having developed a plate to no purpose, and having vainly tried to coax out colours by mercury intensification, I resorted to a trial of a formula for "development after fixing," which I noted in an old BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, and which was devised by Dr. Neuhaus, some years back with a view to "developing" ordinary plates which had been previously fixed.

This subtle intensifier, to give it its proper name, proved exactly the remedy required. It gave me a heliochrome with bright and accurate colours, the visual density of the deposit being very great. Since hitting on this modification of practice, I never do otherwise than *develop very partially*, obtaining all else, including colours, with the intensifier. Sometimes the colours are wholly absent previous to resort to this intensifying device.

This formula, which I found ready to hand, and merely applied to a novel department of experiment, runs thus:—

Sulphocyanide of ammonia	24 grammes.
Sulphite of soda	24 "
Hypo-sulphite of soda	5 "
Nitrate of silver	4 "
Bromide of potash	$\frac{1}{2}$ gramme.
Water	100 grammes.

works pretty quickly. Usually the best results are obtained when the negative looks ruby-coloured by transmitted light, and green on a putty ground by reflected light. The deposit is very fine.

Possibly the Wellington (or Sterry) intensifier would give equally good results, but I have not tried it. The absolute uselessness of ordinary intensifiers in many cases of thin-filmed plates is so marked that I cannot but urge workers to try this modified procedure, which will elicit detail before invisible, and along with this detail the bright colours which are reflected from interference layers, mere traces of which have been filled in by fresh and fine deposits. The silver intensifier has to be mixed with another solution before use. I generally use about 7 parts of the intensifier to 40 or 50 parts of a metol-sulphite (no alkali) solution which is better than the rodinal mentioned in the original formula—being quicker and giving a richer image.

A heliochrome can be "developed" wholly "after fixing," but in my experience a *prior partial* ordinary development with weak ortol or glycine is better; the exposure required is also much shorter.

E. DOUGLAS FAWCETT.

P.S.—To five or six parts of the intensifier add thirty to forty parts of a metol-sulphite (better than rodinal) solution immediately before use. No special alkali is required in the solution. Rodinal, as originally recommended, is convenient, but works more slowly, gives less density, and is apt to cause frilling.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[SECOND NOTICE.]

PROFESSIONAL AND TRADE PHOTOGRAPHY.

We have already commented upon the fact that for some years past there has been a notable absence from the Society's Exhibitions of portrait work by professional photographers, although at one time such work formed a large proportion and an important portion of the exhibits. We believe that in recent years very little, indeed, of such work has been sent in, for, naturally, when professional photographers,

whose interest in photography is primarily to make money out of it, found that their efforts to make an imposing show of their productions were thwarted by the action of the Selection Committee, and the expense they had been put to was wasted, they ceased to attempt this perfectly legitimate method of advertising. We have from time to time expressed our regret that the business side of photography has not received more sympathetic treatment, but, at the same time, we have loyally accepted the decisions of those appointed by the Society to organise its exhibitions in a matter upon which they are necessarily in a position to form a more correct judgment.

However, the difficulty has now been solved in a manner which should be satisfactory to all concerned. These professional or trade photographers who have been far-seeing enough to secure space upon the walls of the present Exhibition have been at liberty to hang what pictures they pleased, and to hang them in what manner they pleased. They have made a very imposing show, and not the least popular part of the exhibition will be two galleries devoted to this section.

As we have indicated, each exhibitor has been left to satisfy his own taste in the display of his exhibits, and in most cases no exception could be taken to the way in which this liberty has been exercised. There are a few cases, however, in which the desire to achieve importance has resulted in prominence of a very undesirable kind from every one's point of view. Every exhibitor gains by the exhibition presenting a harmonious whole. A jarring note which upsets the harmony will certainly secure attention—and also resentment.

Before passing to the work of the exhibitors in this section, we cannot help noticing the absence from the list of many names we should have expected to find there. The space, of course, is limited, and everybody could not be there, but it certainly seems as if some of the younger firms of photographers have shown more enterprise than many of the firms which are universally accepted as representative of photography in England.

In the South Room R. W. Speaight, of Regent-street, shows a good selection of studies of children, a branch of photography which he has made the staple of his business. He has lined his portion of the wall with a light toned canvas, with a stencilled border, and, except that the canvas is hardly sufficiently covered with frames, the effect is fairly good. The exhibit is, however, an example of the disadvantages of decorating a portion of a wall without reference to any general scheme. It happens, fortunately in this case, that much harm has not been done, for the wall is not a very prominent one, and is already broken by the entrance door.

The exhibit of R. Fellows Willson, of New Bond-street, will meet with general praise. The opponents of the modern school of diffusion and rough paper will be able, with complete justification, to point to the exquisite examples of portraiture here shown as proofs that perfect definition and extreme finish are not inconsistent with artistic effect. The work is some of the finest of its kind that we have seen, and that this method of treatment is successful only in small sizes is disproved by examples of quite considerable size, which may be prints from direct negatives or enlargements. Some one in our hearing described the work as "the idealisation of the usual thing," but the expression was not quite a happy one. The work may be what the usual thing might be like; but it is quite an unusual combination of perfect photography and perfect taste.

Mr. W. Crooke, of Edinburgh, occupies a complete wall facing the entrance, and his display may be taken as a model worthy of study by those who may have occasion to make a show of a similar kind. He divides his wall into three panels, the centre one covered with figured tapestry, and the side ones covered with a plain fabric of deep red. The effect of the whole is rich and imposing, and at the same time there is nothing to disturb due enjoyment of the pictures themselves. The decorative design is extremely refined. Many of the pictures are familiar to those who visit exhibitions, and have received a due meed of admiration. They seem to us to lose nothing by being shown in competition with one another. Perhaps even this is a gain, for an opportunity is afforded of studying the characteristic style of the worker. The individuality is so marked that almost in every case the hand of the author is at once apparent, but there is no lack of variety either in subject or treatment. Some of the smaller portraits are quite as commendable as the more important and better known works.

Miss Catherine Edmonds, of Westbourne-grove, W., has a dainty little panel. Many of the portraits are admirable examples of studio work, graceful in pose throughout, as well as good photographically. One or two of the frames, however, could well have been spared, both because they are not up to the general standard of excellence, and because the arrangement would have benefited by a little more space.

Furley Lewis, of Kensington, has some worthy work. The pictures

are rather unequal in quality, and the arrangement of them leaves something to be desired.

Continuing to deal with professional exhibitors, in the North Room H. W. R. Child, of Bloomsbury-square, includes in his exhibit portraiture and reproductions of pictures. The latter are very good indeed. There is also good work among the portraits, but Mr. Child has been singularly unfortunate in his decorations. The somewhat vivid green drapery he has chosen is quite out of keeping with the general arrangement of the room. He has certainly made his portion of the wall conspicuous, but it is in a way that cannot be commended.

The work of John H. Avery is so well known to visitors to the Society's exhibitions and others that we need only mention that his firm's (J. H. Avery and Co.) exhibit contains a selection of architectural, landscape, and technical photographs of the high standard we should expect.

The exhibit of T. C. Turner, of Hull and Islington, N., will extend his good reputation. If we may put it that way, it is an ideal show case. There is so great a variety of style, treatment, method of printing, &c., that the most fastidious visitor to a photographer's studio can hardly fail to find something to his taste, or to become impressed with the ability of the photographer. Much of the work is admirable from every point of view.

As far as space is concerned, the next important part of the section is devoted to photographers who work for the trade, but before passing to these we must refer to the exhibit of the London Stereoscopic Co., whose business includes both trade work and general photography. They occupy the whole of the end of the North Gallery, certainly the most important position in the rooms devoted to the section, and therein was the opportunity to make the most imposing show of all. This opportunity they cannot conscientiously be said to have made the best of. They have chosen to cover the wall from floor to ceiling, or as near as they could get thereto, with a heterogeneous collection of portraits, architectural photographs, photographs of machinery, collotypes made for illustrating catalogues, and other examples of their work, as closely as they could be hung. We would suggest that at future exhibitions the company should be content with a smaller display in which the commercial specimens are subordinated to the artistic. On this vast wall there is some first-rate photography of all kinds, but visitors would doubtless be content with far less of it, judiciously weeded out and hung with a closer regard for the exigencies of the case.

Thomas Illingworth and Co. have a well-arranged panel, principally of enlargements from negatives by well-known photographers. Their piece de resistance is a portrait of the Queen of more than life-size. Their part in its production, as indeed in all the work shown, has been well performed, and if it is not quite the best example of photography that might have been chosen upon which to show their skill, we, as loyalists, can appreciate their choice of subject. The two frames of miniatures deserve examination.

The Autotype Company divide their exhibit into technical work and fine art reproductions. The former are enlargements, in carbon, of course, from negatives from nature, and the latter are from paintings. The exhibit forms quite an exhibition in itself, and need we say more in praise than that they are autotypes.

Messrs. Elliott and Son, of Barnet, have relied upon the skill of George Walton for their decorations. They show a good assortment of enlargements and direct prints in carbon produced from tissue of their own manufacture. In variety of tint and general beauty of result their carbon work evidently approaches perfection. The enlargement in sepia-carbon from a negative by H. Walter Barnett, which forms their centre piece, certainly could not be excelled.

The Kodak Company make a strong bid for popularity. Their exhibit consists principally of a series of enlargements of South African war subjects, produced on royal bromide paper toned. A very interesting series indeed, and well illustrating what the Kodak is capable of. Their wall is very tastefully arranged and decorated, but it is a little monotonous. The toned bromides, though not wanting in sufficient contrast when looked at individually, appear somewhat weak when viewed collectively, separated only by a framing which approximately matches their own half-tones.

Morgan and Kidd show trade and commercial photographs, including half-tone work and collotypes, and enlargements, up to their usual standard. A large portrait of General Lord Roberts, painted in oil, in the most brilliant of scarlet uniforms, strikes a very decisive note among its surroundings.

The Selke Photosculpt Co., of Berlin, show examples of sculptures produced by photographic agency. They will be examined with interest as an unusual, if not entirely novel, application of photography. The method or methods of their production have already been published.

V. 33

PICTORIAL PHOTOGRAPHY.

The most important gallery of the suite is devoted entirely to pictorial photography, which, for the first time, is displayed apart from the competing attractions of apparatus, &c. In size the room is approximately the same as that at Pall Mall. The number of frames hung is very nearly the same as at last year's exhibition. The Hanging Committee have not attempted any scheme of decoration, but the low warm tone of the walls is far from unsuitable for the purpose in view. The general effect is restful and pleasing, though perhaps a little sombre. A word of praise is due to those responsible for the arrangement of the pictures, especially considering that much of the experience gained at past exhibitions was unavailable. With workmen accustomed to their methods, a different system of fastening the frames to the walls and other difficulties incident to the change, their task has not been a light one.

The selection appears to have been performed with even more than the customary care, and leaves little ground for complaint of any kind, except, of course, from those unhappy individuals whose wails are heard after every exhibition. Certainly there can be no complaint of want of catholicity. Probably no collection of photographs has yet been exhibited containing so much variety in everything that can be varied in a photograph as that at present on view. This is as it should be at the annual exhibition of the leading Society in the kingdom.

The judges have awarded only two medals, and the awards will be received with neither more nor less than the usual amount of criticism. One of the medals is given to W. T. Greatbatch for a print in carbon of a warm brown tint called "The Orchard." It is admirable in the correct rendering of tones, in atmosphere, and in conveying a sense of the joyousness of summer, but many will take exception to the composition. The principal object is a crooked tree trunk, cut off by the top of the picture just where the branches are commencing to spring from it. Its lines are almost precisely repeated in a smaller tree trunk in the middle distance. Whether the lines are offensive or not is a matter of personal feeling. The other medal is awarded to Percy Lewis for "Venice," and this and Mr. Lewis' other exhibit, "A Venetian Waterway," are, we think, the most satisfactory renderings by photography of Venetian scenes we have met with. The portraiture has not been kept together as has been the custom in recent exhibitions, and our impression is that there is rather less than usual of what may be strictly termed portraiture, and, truth to tell, it is, generally, less important in size, and the larger work does not rouse us to much enthusiasm. H. Walter Barnett sends two portraits, one of which greatly pleases us. F. Hollyer, in his portrait of Snowden Ward, has not succeeded in preserving his usual distinction of style. This very nearly approaches the commonplace. A portrait by R. Porteous, of Melbourne, Australia, is particularly interesting as an example of what our brethren in the Colonies are capable of. It is a piece of really sound work. "A Portrait of a Lady" by A. Cochrane, has some good points, but it seems a direct imitation of rather than an inspiration from the work of the early British school of portrait painting, &c. "John Leighton, F.S.A.," by Rev. F. C. Lambert, is totally deficient in the qualities we should expect to find in the work of one who has been so long looked upon as an exponent of pictorial photography. But if the more ambitious work is so tame, there is much among that of smaller size to win admiration. Arthur Hewitt, of New Jersey, U.S.A., sends several portraits and figure studies, and among them are several worthy of notice; though not perhaps the most striking among them, "An Oxonian," pleases us as well as any. The simplicity and even severity of the treatment are so well in keeping with the character of the subject that we can conceive nothing better of its kind. The work of R. Fellows Wilson we have already referred to in dealing with the professional exhibits. It is a testimony to its quality that the two exhibits among the professedly pictorial work lose nothing of their claims to admiration. Miss M. Weil is represented by some half-dozen pictures, some of which may be classed as portraits, in one case as half a portrait, and about this we maintain a respectful silence. The idea is either sublime or ridiculous. "Eleanor" is perhaps the quaintest thing in the exhibition. The seated figure of a little girl in a room, with a large book in her lap. The pose and point of view seem designed to illustrate everything that the instruction books tell us not to do. It is quite a triumph in its way. All Miss. Weil's work is interesting. Among her figure studies, "The Song of the Lark" and "Across the Fields" will probably be the favourites. "A School-boy," by C. Sweet and "A Portrait Study" by F. A. Bolton deserve looking at as examples of the successful treatment of that not very easy subject to deal with pictorially, the boy.

Among the figure subjects, "The Madonna and Child," by R. Eickemeyer, is notable rather for the boldness of the attempt than for the

completeness of its success. The wisdom of attempting such subjects is questionable. W. M. Warneke, who sends but one frame, departs from his usual style. His "Golden Age" represents a child bathed in sunlight on the rustic steps of a garden. The figure is so happily rendered that one can not help regretting that there was not a greater subordination of its surroundings. It narrowly misses being fine. J. H. Gash has a fine thing in "Riveters," a homely enough subject; two mechanics at work on a ship's side. The subject is very skilfully handled. "A Warm Job," by the same artist, is not nearly so good, and it loses by being so thoroughly reminiscent of F. Marsh's "Gas Stokers," without being so successful. J. A. Sinclair's "Scavengers" is a picture that will impress itself on every visitor's mind, it is so strong and bold. Two scavengers, not the Metropolitan variety, but apparently of Spanish or Italian growth and environment, marching along with brooms over their shoulders, strongly outlined against a white wall. The sense of sunlight is perfect. There are at least two pictures in the exhibition which remind us of the bygone days when Diston and Hubbard were leading lights in the photographic world. "The Miser," by H. E. Brightman, is a very good specimen of work of the kind. It is so well got up that one is almost convinced of its truth. "The Spinner," by F. A. Bolton, is more natural, and is fairly successful. "A Question of Cost," by T. Lee Lymns and "In the Smithy," by J. A. Armitage, are both worthy of more than passing notice. Two pictures designed to illustrate the book, "Trelawney," should be carefully studied by those who are interested in the possibility of applying photography in this direction. They are by C. Y. Abbott.

Quite a feature of the exhibition is the figure work sent in by American photographers. But a few years ago all but a few prints from those sent from across the Atlantic had to be rejected on account of their entire want of pictorial qualities. A few workers, such as Miss Weil and R. Eickemeyer, were well known to and esteemed by us, but the bulk of the work sent was of that cold, hard, uncompromising kind which had long since ceased to be attractive here. Now all this is changed. The United States are represented by close on fifty pictures by about a dozen contributors. The American work, speaking generally of it, is the most daring in the exhibition. Old conventions, not only with regard to treatment, but with regard to mounting and other matters, have been thrown to the winds. Some of the work has little but its eccentricity to recommend it, but, in all but the extreme cases, there is a thread of fancy running through it which will make itself apparent to all who choose to look for it with sympathetic eyes. To unsympathetic eyes the kind is excusable. The work of E. J. Steicken, F. Eugene, T. C. Abbott, and Dr. Detelefsen and some others will create surprise amongst those whose ideas of photography have formed from what has been exhibited at the Society's exhibitions in former years, and opinions about it are not likely to be unanimous. It must not be thought, however, that all the American photography shown here is of the extravagant type. A fair proportion of it would be acceptable anywhere.

Architecture subjects do not seem so plentiful as usual, perhaps it is because no attempt has been made to keep them together, and the fashion of the day seems to be for effects of light and shade in carefully chosen corners rather than for open effects in choirs, transepts, and naves. H. W. Bennett maintains his reputation. His half-dozen contributions are all so good that it is a pity to try to make a selection. W. T. Greatbach sends some very pleasing work. C. Barrow Keene has as his one contribution a very satisfactory number entitled "A Cottage Stairway." We paused over work by H. J. Yates, R. R. Rawkins, and certainly the best exterior in the exhibition is "The Temple of the Caryatides," by John Bushby.

Pictures that would be unclassed under the simple grouping of landscapes, figures, and architecture seem singularly few this year. Three pictures of dogs by P. Von Schoeller deserve especial mention for the originality of the treatment, and these with "Rest," by W. Reid, a study of horses, are about all the animal pictures in which the animal interest is not subsidiary to the landscape. We might mention here, though, of course, it is not strictly a landscape, the fine snow scene by Mrs. Le Blond, better known to the photographic world as Mrs. Main, and also a very charming little picture, "The Burning of the Saale," by E. Kingsland.

We now turn to the landscapes, to-day as of yore the strongest feature of the exhibition. We have already referred to Mr. Greatbach's medalled picture. Scarcely less meritorious is his "Summer Reflections." It is a little less uncommon subject, but still it is a worthy fellow. C. Job has never produced anything better than his two works here. They even deserve extravagant praise. The three landscapes of F. A. Bolton impress us almost as favourably. W. Thomas does not

seem quite in his usual form. "The Old Mill" is bold, and as a subject well chosen, but it is distinctly wanting in atmospheric perspective. A. Keighley's work is disappointing throughout; he has adopted a very low tone, to which no exception could be made, but in obtaining his low tone he has lost his truth of gradation. J. B. B. Wellington has a fairly good picture in "Stanmore Common," but it is not the best work he has accomplished. J. Page Croft has several pictures in his usual style. We prefer "Sentinels" of his work. J. A. Sinclair keeps to his preference for illustrating foreign countries. Spain is here his fancy. "The Water-carrier" is a clever effect of sunshine, and as interesting as an illustration of a phase of life as it is pictorially. He has not been so successful with his other attempts. J. C. Mummery sends three pictures. We prefer "Leigh Ray," in which he has used the gum bichromate process to the best advantage in obtaining an effect of atmosphere which is incompatible, or at least, very difficult with most photographic printing processes. "Pagglesham Pool" is hardly less pleasing. C. F. Inston has perhaps attempted a greater variety of subjects than usual, but his most successful work is still by the sea. "Whence and Whither" is remarkable as a picture of the open sea, with no object of interest other than the waves themselves, which might be employed to illustrate composition. Hardly less satisfactory is "Clearing Up," notable for its luminosity and for the truthful effect of the clearness of atmosphere one often finds after a summer shower.

Three works are exhibited by the hands of the late W. J. Warren. They will increase our regret at the loss of so promising a worker. The principal is "Whitby," which we fancy is an elaboration of a smaller picture of the same subject. Dr. Llewellyn Morgan also shows among others some characteristic views of the same place. Our old friend, H. P. Robinson, F.R.P.S., though not occupying the post of honour in the New Gallery, amply demonstrates that his ill-health, which we deplore, though it may have rendered him less active, has not affected his skill. He is represented by two pictures which every one would recognise as his work. We must conclude our notice with a regret that we cannot deal with the numerous good things which we have marked in our catalogue.

TIMING ENLARGEMENTS BY THE RUMFORD PHOTOMETER.

SINCE every enlargement from a given negative requires a different exposure from that of a larger or a smaller one produced by the same illuminant under the same conditions, it is a convenience to be able to determine the exposure of each by reference to a constant. A constant adopted here is the time and distance from a candle required for the correct exposure of a contact print from the negative that is being dealt with. In other words, if we know the time required for a contact print at a certain distance from a repeatable light, we can easily determine the approximate exposure required for an enlargement of any extent.

The method to be described depends on the truth of a proposition that is by no means self-evident, but that is capable of proof, viz., that an enlargement and a contact print from the same negative require equal exposures when the illuminating power of the light and its distance from the bromide paper are fixed, the rays of light in both cases passing through the condenser and objective. When the lantern, that is to say, is set up and an enlarged image of the negative is cast on the bromide paper, exactly the same exposure will be required for that enlargement as for a contact print made by removing the negative from the lantern and placing it in contact with the bromide paper.

At first sight one might argue that, since all the light passes through the negative to form the enlargement and only a small portion to form the contact print, the time of exposure must be different for each, and that, in order to get equal times for each, all the light would have to be concentrated on the negative when the contact print is being made. But this argument is fallacious, as the following reasoning will show.

Suppose a perfectly transparent spot in the negative. When the negative is in the carrier of the lantern a certain quantity of light passes through the spot, grows weaker and weaker by the law of inverse squares, and finally reaches the bromide paper, upon which it impinges with a certain intensity and area. It gives an enlarged image of the spot, and a definite exposure is required.

Now, if the negative be removed from the carrier and pressed against the bromide paper the exposure for that transparent spot will, without doubt, be exactly the same, because the spot, in virtue of its transparency, has in no way affected the intensity of the light falling on the bromide paper. It has merely limited its area.

Absolutely opaque spots—assuming the possibility of such—may be left out of account, since no light whatsoever passes through them; and we now come to the most troublesome question of all, that of half-tones.

A little thinking might incline us to believe that the half-tones will not take equal times for contact print and for enlargement under the conditions specified, and that in consequence the scale of gradation of the enlargement will differ vastly from that of the contact print, but a little more thinking will convince us that exactly the same holds good for a half-tone as for a transparent spot. For a half-tone passing a certain quantity of light may be regarded as equivalent to a transparent spot passing a less quantity of light, since a half-tone which transmits a definite fraction of the light passing through it will transmit that fraction whether its position be near to or remote from the source of light.

Having settled the preliminaries, we may now describe the method. A concrete illustration will afford the simplest means of doing so.

Let us imagine that we are going to enlarge from a given negative. We know, or we find, that a contact print from it requires ten seconds at one foot from a candle. The lantern is set up, the negative is inserted, focussed, and arranged. The negative is then removed from the lantern, and the intensity of the illumination of the screen is determined in terms of the candle by means of a Rumford shadow photometer as follows: Two shadows of a rod are thrown on the screen by the lantern on the one hand, and the candle on the other. The candle is moved to and from the screen till the shadows of the rod are of equal intensity, till, that is to say, the shadows are equally illuminated by the lantern and the candle. The distance of the candle from the screen is then noted. We now know that the light falling on the screen from the lantern is equal to the light from the candle at the distance determined, and a simple calculation gives us the exposure required. Three feet, let us say, is the distance of the candle from the screen. We know that a contact print required ten seconds at one foot from the candle, and we know that the time of exposure varies inversely as the candle, whereupon we know that the time of exposure at three feet from the candle will be nine seconds—which is the exposure required for the enlargement.

This may seem troublesome. In reality it is simplicity itself, and a greater saver of time that is sometimes wasted in exposing and developing trial strips of paper. It is not necessary to make a trial contact print by candle-light if the time and distance for a contact print with any other repeatable light such as a gas flame are known. In such a case it suffices to translate the gas flame into candle power by the use of the Rumford or other photometer, and to calculate the exposure required with the candle. Thus, ten seconds at a foot from a gas flame or five candle-power become fifty seconds at a foot from a candle. The rest of the procedure is the same. It will be found that, unless the light used as a constant approaches in actinic value the lantern illuminant, some allowance must be made for the discrepancy. Hence only an approximately correct exposure may be looked for in a first trial. But by experiment the ratio of the actinic values of the two lights may be determined once for all in the form of a fraction, and allowance made in the future.

J. CAMPBELL SMITH, M.A.

BUSINESS METHODS AS APPLIED IN PHOTOGRAPHY.

[A paper read before the New England Convention at Boston, September 13.]

THERE is a common notion among photographers that business methods mean an elaborate system of red tape—book-keeping, ticketing and checking the customer, his order, and every detail of the day's work. Now, while it is desirable that the photographer should keep his books in good shape, and have an intelligent control of his establishment and its working, the business methods which I propose to discuss do not concern these details particularly. What we are after this morning are those schemes, plans or methods by which successful photographers create business, and make it grow from day to day.

The whole question of business methods was very aptly put to me a few days ago by Pirie MacDonald. He said: "Tell the boys that they must make business; that if they are content to take what comes to them they will end their days in the poorhouse." The man who grasps this idea has taken the first step towards better days. There has been altogether too much waiting for business in professional photography. The day has gone past when a man can hope by good work alone to draw people into his studio. The successes of recent years have been won by men who could think out and put in operation schemes by which business was brought to the studio. Here, then, we have the field for method in photography as a business. It covers the getting

of business, and then the successful management of business when obtained.

Mr. MacDonald has been very busy all summer. His methods (if we knew them) would give us some very interesting data; but he did not tell me anything of them. The fact of the matter is, of course, that it is impossible to set forth any business methods of universal application. What is appropriate or successful in Chicago may have no application in Boston. Methods which would be profitable in New York might be unproductive in Savannah or Kalamazoo. In short, it is obvious that the method must be evolved by the man, to fit the special requirements of his locality or the needs of the moment, or the clientele he has in view.

How shall a photographer turn himself out of his rut and begin to infuse modern methods into the conduct of his business? First of all by realising the factors which are of most importance in business to-day; his personality; his methods of publicity; the character of his work; and his place of business. These must all play their part both in creating and retaining business. Here we have points sufficient for our talk; let us try to cover them.

THE PHOTOGRAPHER'S PERSONALITY.

There can be no doubt about the great influence of a man's personality in his business. Photographers have been very much at fault here. They keep themselves too far behind in the social and business life of their cities. They confine themselves too closely to the mere following of their speciality, and their horizon is too often bounded by things which pertain to "cabinets" at so much per dozen. The successful photographer, or the photographer who would be successful, should take a wide and lively interest in the affairs of his town, or of a good "set" in that town. This is necessary in order that he may know intimately "who is who," what is about to happen, and what chances there are day by day to improve his position in the community, to turn events to good business advantage.

There is a great deal in the point of view from which you conduct your business, the point of view, that is, which you take before your neighbours. It is not at all difficult when one is residing in any locality for a year or two to "size up" the more prominent people in that locality, to tell fairly correctly where they stand, and the estimate they put upon themselves. And you may be very sure that the world will take you pretty much at the estimate which you put upon yourself. If your establishment is obviously behind the times, lacking in attractiveness or good taste, your business stationery crude and out of date, and you are seen to take no part in the public life about you, it is only natural that your townspeople will take you at your own estimate and conclude that you are a "back number." If we could run over a list of the most successful photographers in the United States, and see them as they are at home, we would find them all men vitally interested in the life and progress of their towns, wide awake to every possible advantage which this or that turn of events may bring about, scrupulously careful about their personal appearance, and of their standing in the community. Careful, also, about the appearance of their places of business. In fact, you will find them known among their fellow-citizens as men of intelligent enterprise and public spirit.

THE PLACE OF BUSINESS.

Let us now take up the detail of the place of business. It is most important that your public rooms should be not only clean and attractive, but also easily accessible and properly placed before the public eye. There is, of course, no excuse whatever for dirt or uncleanness in the photographer's establishment, but photographers do not always realise how unattractive their places are. They grow accustomed to the accumulation of rubbish, properties, and discarded specimens which naturally gravitates about a studio. It does not seem to occur to them to look at their places from the point of view of my lady, who is careful about her dresses, and who has no pleasure in visiting the average studio because it is "such a dusty, dirty place." It would be well for photographers to regard their public rooms from the point of view of the physician (I won't say dentist), or the picture gallery. Let us have rooms which are evidently designed to give the visitor a good impression of the profession to which they are devoted; which will give the visitor the impression that the photographer follows an art rather than a mechanical trade.

This brings us to the important matter of display. Perhaps I am wrong, but I think that photographers over-reach themselves in this detail of display. Wherever one meets the photographer's place of business, the conglomerate collection of specimens of his work at every turn, in all sizes, colours, and degrees of freshness, gives one a very "cheap" idea of photography—the idea of the machine rather than of an

art. There is room for better methods here, of which, however, I have little time to speak. A small but choice display, changed every day or every week, will give the public a much higher idea of your profession, and the risk of showing poor or mediocre work will be largely avoided. Let me suggest to you that it would be well to make your displays not only smaller, and more carefully selected, but also more educational. Thus there can be little doubt but that the public would be interested in a series of little exhibitions giving, one after the other, a display of the advantages of carbon, platinotype, sepia-prints, aristoplano, and plain, glossy prints in portraiture. A small descriptive card accompanying each display would, of course, add to the interest of the exhibit. Special displays of this kind, grouped around novel or practical ideas, will doubtless suggest themselves to you. For certain classes of trade a card, embellished with a photograph, of course, inserted in the street cars, would be a profitable method of display. Small exhibits in the public places of your towns also suggest themselves as likely to help in creating new business. It would be possible to talk all morning, or a week, about this one detail of the photographer's display, but I leave it to you, only emphasising the desirability of making your display produce a better impression than can result from the average exhibit of the average gallery.

PUBLICITY.

After display comes the question of methods of publicity. Here, again, the photographer is lamentably behind his times. Take the very simple matter of the photographer's stationery. Every communication you send to your customer is as important in a business way as a personal visit. When you write a letter to your customer you should be as careful about the appearance of that letter as you would be about your own personal appearance if you were to meet your customer. Glancing back over the business letters received from professional photographers of every class during the past ten or eleven years, an experience covering many thousands of letters, I cannot recall more than a dozen instances where the printed matter was worthy either of the photographer or of his profession. Your letter heads, envelopes, announcements, and price lists should reflect your individuality and taste equally with your portraiture. Many photographers excuse themselves in this matter by saying that they have not the gift of putting such things in shape. Nowadays, however, when every town has its artistic printer or its advertising expert this detail of appropriate business stationery should not present any great difficulty. The same thing applies to the "booklet"—the little book which photographers issue to advertise their studio and capabilities, and acquaint possible customers with little details which need attention in preparing for a sitting. It is astonishing that this method of publicity has not been more generally used. No profession lends itself so completely to the preparation and use of a dainty advertising booklet as that of the photographer. Thus, let us suppose that you have prepared for you a little booklet such as I have indicated. By leaving two or three pages blank, and mounting thereon for one effort a sepia print, for another effort a carbon miniature, and for another effort a platinum vignette, you have good material for three profitable excursions among the best people of your locality. And you may be sure that a little booklet, carefully written and printed, and illustrated this way, will not be thrown aside. Several papers dealing with the preparation of such a booklet have been published in the journals of late, and I would advise you to look up these papers and lose no time in putting into circulation a booklet adapted for the trade you are seeking. If you cannot prepare a booklet for yourself, you will do well to get hold of someone skilled in the preparation of advertising matter, and pay him whatever is reasonable for the work.

About methods of handling customers I can only give you a word or two. There should be more elasticity in dealing with your people than perhaps many of you have been accustomed to. Thus, the old-fashioned notions of prohibitory notices regarding the return of proofs, penalties on resittings, too much insistence about prepayment, &c., all these things are out of date, and have long been discarded in progressive studios. If you will look at these things from the point of view of the customer, you will see that they are against, rather than for, the growth of the business—clumsy methods of attaining certain ends which can just as surely be secured in more pleasant ways. A clever receptionist can make sure of payment, get all the proofs returned, and manage the detail of resittings without these clumsy methods of the old time.

THE RECEPTIONIST.

Let me not forget the receptionist—generally, and preferably, a woman of refined and gentle manners, well informed and specially gifted in handling people of varied dispositions. A woman especially who knows how to handle other women, and who can make herself beloved by the

children who may visit the studio. A woman also, who in a thoroughly suave and dignified way knows just how to handle the young man of the period, so that the photographer may be glad to have his business. What a power the receptionist is when properly chosen and trained. It is not too much to say that she can both make and destroy a business, if she has the amount of discretionary power given to her in some galleries. Let me put my finger here upon the mistake made in many galleries when choosing a receptionist. A photographer often values his receptionist according to her power of persuading more business than the customer intended in coming to the studio. The skill to do this is indeed worth a good deal, but the knowledge when and when not to use that skill is altogether more valuable. This "working" of the customer should be done with the greatest discrimination. People quickly jump to the fact that they are being "worked," and if it is overdone they will avoid the studio where such practice obtains.

Let me relate to you how this practice of "working" the customer is followed in one of the largest studios of the West. The receptionist of that studio has a card index containing the names of all the most prominent people of the city, their financial standing, and their circumstances. When a customer comes to this studio, the receptionist skillfully holds him or her in conversation until an assistant has given her the card containing the record already mentioned. According to the information given by the card the customer is thereafter systematically "worked" both at the desk and in the studio. It is unnecessary for me to detail how this "working" is done, but the system is worthy of a word or two. In so far as this and similar methods are useful in aiding the photographer or his assistants to handle his customers to advantage, they are praiseworthy. But, where they are "worked" without the most careful discrimination, they will, I believe, speedily degenerate into blackmail and end in ruin. Especially is this likely to happen in a studio where commissions are given to the employees for all work which they may influence or secure over and beyond that which brought the customer to the studio.

The use of the card index system, by the way, occupies a special place among business methods of to-day. I have not time here to go into it, but I would urge upon you the advisability of looking into and getting a good grasp of the advantages of this system, both in labour saving and in "following up" lists of customers and similar uses.

MODERN versus OLD-FASHIONED METHODS.

Now, let us take an actual instance illustrating many of the points I have mentioned, and contrast modern with old-fashioned methods. Some time ago I had a visit from a friend who has for some years resided in a flourishing western city. As an amateur he had made a speciality of portraiture, and naturally his ideas gradually turned towards the making of portraits in a professional way. His moves were most interesting. His position in his town had given him an intimate acquaintance with the best known men in the business and social life of the place. To complete this acquaintance for business purposes, he cultivated a little group of women journalists who had charge of the "society reporting" for the local papers, and won their interest and help. When he was ready for business they could tell him just who was at the top in current events, could furnish him with lists of desirable patrons, and inform him beforehand of social affairs which he might possibly be able to turn to business advantage. He saw that the local professionals (being asleep) had clung to their down-town studios; were neglectful of modern ideas; and that their places of business were inaccessible, guiltless of elevators or similar conveniences. He perceived, too, that their point of view was too "cheap" for the best people of that town, and that consequently much of the most desirable work was going to a near-by city. What did he do? Selecting a corner lot in the residence section, away from the dust and bustle of the town, he built himself an artistic studio; kept his rooms all on the ground floor; made sure of a spacious skylight, and public rooms with ample room for display; got an expert to prepare a campaign of advertising or publicity to cover the first year; inaugurated, to accompany this campaign, exhibitions of work at the studio; placed, month after month, by means of his society lists, attractive announcements of his studio with specimens of his work, among the desirable people of his locality; would make nothing but platinum and carbon portraits, and fixed his prices at \$10 and \$15 for a dozen cabinets. What happened? He succeeded from the start, and to-day is building the best business in his town, while the old-style professionals are grubbing along, complaining more profusely than ever.

Some days ago the business methods employed by Strauss, of St. Louis, were under discussion. One who knew Mr. Strauss and his methods intimately said: "He has a beautiful place, a staff of clever assistants, and he does beautiful work; but it is my opinion that the

biggest feature of his establishment, the thing which impresses people most when they visit the studio, is the wonderful courtesy which is extended to all visitors, whether they come for business, curiosity, or pleasure. You know, of course, that the Strauss Studio is one of the show places of the town, and that people have got into the habit of taking their friends to see the studio as a local institution. Mr. Strauss has three assistants entirely devoted to the work of showing visitors about his beautiful rooms, making his customers comfortable during their stay there, &c. Then his "convenience department" has been a big feature. There are no banks or express offices within a mile or so of the studio. Seeing this, Mr. Strauss created a department where the people of his locality could obtain small change, or have their checks cashed, or leave parcels for collection by the various express companies, without the bother of sending into the city. These conveniences, and everything else about the gallery, are held open to the public, and the popularity which Strauss has gained in St. Louis has been won quite as much by his generous hospitality and courtesy as by his portraiture." This, of course, refers to the gallcry which was burned down some months ago. I merely relate the conversation to you so that you may have the suggestion which it offers.

In this way we could go on from sunrise to sunset, discussing the thousand and one points at which modern methods or intelligent enterprise along definite lines might be advantageously applied in professional photography. I have, however, wearied you sufficiently for one sitting, and therefore make an end, with my thanks for your patience and attention.

JOHN A. TENNANT.

A CONTRIBUTION TO THE THEORY OF PHOTOGRAPHIC DEVELOPMENT.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

INVESTIGATORS of this subject seem latterly to agree that the greater part of the silver forming the negative is not attributable to the direct action of light. This view receives considerable support from the fact that a plate, which has been exposed and fixed, contains scarcely any silver, and cannot be developed with a developer which does not contain a silver salt. From my former experiments it is highly probable that a plate, fixed immediately after exposure, contains no metallic silver whatever, and that there is merely an extremely attenuated image formed of sulphide of silver, which cannot be destroyed even by prolonged action of concentrated nitric acid, and upon which a silver image may be formed, and repeated at will, by deposition from a super-saturated solution of silver. This was the first complete explanation of the development of a fixed plate.

We have now to consider the mechanism of the deposition of silver upon the particles of exposed silver bromide in development, which, from the experience we know, are more easily reduced. The opinion was accepted for a considerable time, upon the authority of Lermontoff and Eder that processes of electrolysis took place between the silver, developer, and silver bromide, by means of which larger quantities of silver were deposited upon the image. This theory was ultimately abandoned, when it was shown that Eder's experiment, its principal support, was inexact and incorrectly interpreted. It was replaced by the opinion, that the developer took up reduced silver from the unexposed silver bromide, and that this solution becoming super-saturated, even at a low degree of concentration, deposited, in its meta-stable state, the metallic silver upon the very minute particles (formed from sub-haloid) already there. This opinion lends itself readily to experience. The differences in the external condition of exposed and unexposed particles of silver bromide are also sufficient to account for the precipitation. This theory, which is adopted by Ostwald, Abegg, Schaum, Luther, and others, easily accounts for the difference which formerly appeared to exist between physical and chemical development. On the other hand, it suffers from the disadvantage that it cannot be confirmed by direct experiment, for if no silver is found in solution in the developer, it may be answered that the quantity is of necessity extremely small and only momentarily there. In addition to this there is also the fact that a certain quantity of bromine taken up by the developer, which progressively counteracts its assumed capacity to hold silver in solution. This does not agree entirely with Abegg's application of the law of volumetric action to the process of development, which is not unexceptionable in its hypotheses and inferences, but nevertheless it agrees best with general experience, for the deposition of silver attains a maximum in a relatively short time, and then progresses slowly.

On the other hand, the super-saturation theory has the advantage of being independent of any assumptions concerning the nature of the

latent image. Any superficial change brought about by the action of light suffices, whether it be of chemical nature or not. It must, however, extend to the surface of the individual particles of silver bromide, since the surface of the plate does not suffer any possible change, as I have previously shown.

Concerning the existence of the sub-haloid, it may be useful to mention that I do not think its existence proved, despite beautiful experiments made by Luther. Many other compounds may be the cause of similar potential advances in the curves, provided that the relation between haloid and silver remain the same. The hypothetical compound, $\text{Ag}_2\text{O} \cdot 2\text{AgCl}$, may be taken as an instance. Upon chemical grounds, its existence seems quite as probable as that of sub-haloid. As the deposition of the silver must occur at the surface separating the two phases of which the system, silver and silver solution, is composed, or, in other words, at the surface of the particles of silver bromide changed by light, which have in a very short time been covered with a film of silver, it might be expected that the deposition of the silver would first occur upon those particles which had undergone most change, and that in consequence of the larger surface progress would be more rapid. This would give rise to coarser grain at the parts where exposure had been greatest. But microscopic examination contradicts this conclusion. We find a greater number, instead of larger-sized particles at those parts, where exposure has been most. The super-saturation theory avoids this difficulty by the wider supposition that increase in the size of the particles is small in comparison with the direct action of light predisposing to development, which penetrates the film to the depth at which light absorption by the particles of silver bromide attains a minimum. However great the amount of work done by light may be, we can entirely disregard the question whether the change be chemical or physical. In this respect it is well to impose careful limitations. It is, however, important to assume that only those particles are reduced, or bring about deposition of silver from the super-saturated solution, which have received a certain amount of exposure at least equal to the inertia (Schwellenwerth) of the plate.

I consider this supposition indispensable to any possible theory of development. Without it, chemical fog must be formed directly development begins, and it would be possible to develop to any degree of density a plate which had been under-exposed, or not exposed at all. This is not true in either instance. Moreover, it would be possible to develop to any degree of density an unexposed silver bromide emulsion to which metallic silver had been added. Experiments in this direction have been made by Abegg and Herzog, and likewise by Schaum, but in both cases with no results, and the more rapid tendency to fog, which was actually observed in the former case, may have been due to other causes (traces of free silver salt, difference of permeability, &c.).

If the above supposition be granted, the super-saturation theory gives an almost unconstrained explanation of the small lateral extension of development where sharp contrasts occur (irradiation in development). (When experiments of the kind are made the utmost caution should be observed, if mistakes due to the optical properties of a cloudy medium and diffusion of light are to be avoided.) Another objection is likewise obviated, which would be fatal to the super-saturation theory. I formerly described an experiment in which the silver image on an unfixed collodion plate was destroyed by submitting it to the action of nitric acid, so that only a positive formed of silver bromide remained. Such an image cannot be reduced to silver by prolonged action of a hydroquinone developer (more than half an hour was tried). On the other hand, a metol developer, containing a silver salt, at once deposited silver upon the image in such a manner that a normal silver positive was obtained. The deposition in this case, however, is proportional to the extent of surface implicated in the two phases, that is to say in proportion to the surface of the particles of silver bromide, the number of which may be determined for the various thicknesses of film, on account of their approximately equal size. The development with an ordinary hydroquinone developer only occurs after the plate has been exposed to light, which proves the necessity of the enlarged hypothesis, if the super-saturation theory, which is otherwise in harmony with the facts, is to be maintained.

In conclusion, those experiments remain to be discussed, which are regarded as the essential and conclusive basis of the nascent silver theory of development. These refer more particularly to Abney's work, which is so frequently quoted. As fresh experiments are necessary to the treatment of this question, we refer to our paper upon this subject.*

Heidelberg, June, 1900.

J. PRECHT.

* THE BRITISH JOURNAL OF PHOTOGRAPHY, VOL. XLVII., NO. 2109, P. 633, OCTOBER 5, 1900.

COPYRIGHT PORTRAITS.

It is obvious that what would be regarded as "a valuable consideration" in respect of the copyright portrait of one person, might not be so considered in the case of another. The commercial value of copyright portraits must, of necessity, vary greatly. It will vary with the course of events, for one thing. We have many instances of this in respect of the photographs of military men. At one time they may be practically unknown to the average person. In a short time, through some notable military achievement, their names may be on everybody's lips, and the commercial value of their portraits will consequently increase enormously. Most photographers, doubtless, would be pleased to give military officers about to proceed on active service free sittings as a commercial speculation, and, in the case of a general off to the front, most photographers would probably be pleased to offer a handsome cheque as "a valuable consideration" for permission to take their portraits for copyright purposes, to be used for publication purposes if desired.

The commercial history of these diminutive buttons imprinted with photographic reproductions of popular generals, which have recently been selling in such large quantities, would provide interesting, and, very probably, somewhat surprising, reading.

The average photographer has probably few sitters whose portraits would be valuable for copyright purposes. Of course, as has been recently remarked, one can never tell. A person unknown to fame today may be famous to-morrow. But the ordinary photographer cannot conduct his business in speculative lines, and with him "a bird in the hand is worth two in the bush," in most cases.

When a person reaches that interesting stage when he can be described as being "in the public eye," or "somebody" as one of the illustrated journals has it, it would seem that there are only a few firms which are capable of doing photographic justice to his features. So much the better for the favoured few, it will perhaps be said. At the same time, this seems rather hard on the local photographers, many of whom are very capable workers. It would rather seem that a person can not be a celebrity unless he has been photographed by certain eminent firms.

Members of the Royal family, happily for a few photographers within the charmed circle, spend a considerable fair portion of their lives posing before the camera, and in some instances the photographers who have the privilege of photographing Her Majesty make arrangements—no doubt very satisfactory arrangements—whereby the photograph is exclusively published in one journal. This is, no doubt, smart journalism and perfectly legitimate. At the same time, some old-fashioned folk might consider that such procedure is not quite the thing.

The sale of photographs of Royalty is quite a lucrative business in itself, and no less than 80,000 copies of the photograph of the Princess of Wales attired in the robes of a doctor of music were sold, and the well-known "four generations" photograph was almost equally popular.

With all respect to the eminent firms which have the privilege of photographing royal personages and notabilities, it would be absurd to assume that of the many hundreds of professional photographers, only some half-dozen are capable of performing such work.

Although the matter really only concerns the sitter and the photographers concerned, it would be interesting to know what the "valuable consideration" is in such cases.

J. A. REID.

Our Editorial Table.

"THE B.P. COMBINATION KEY."

Manufactured and sold by the Scotch and Irish Oxygen Co., Polmadie, Glasgow.

AMONG the new productions in connection with lantern accessories for the coming season, there falls to be noted a very ingenious tool which the Scotch and Irish Oxygen Co., Ltd., are about to place on the market. Most lantern operators who have to travel over wide areas, and are compelled to draw their gas supplies from different compressing companies, are alive to the fact that the gland nuts and other fittings of the various companies are not the same in size throughout, and it is to meet this difficulty that the Scotch and Irish Oxygen Company have devised their B.P. Combination Key.

By means of this cleverly-conceived tool an operator can manipulate the fittings of any of the different company's cylinders. There is no doubt this handy tool will meet a want that has existed for a long time, and every lanternist ought to possess one. The following description will enable our readers to form an opinion of the capabilities of this key, which may be said to be universal.

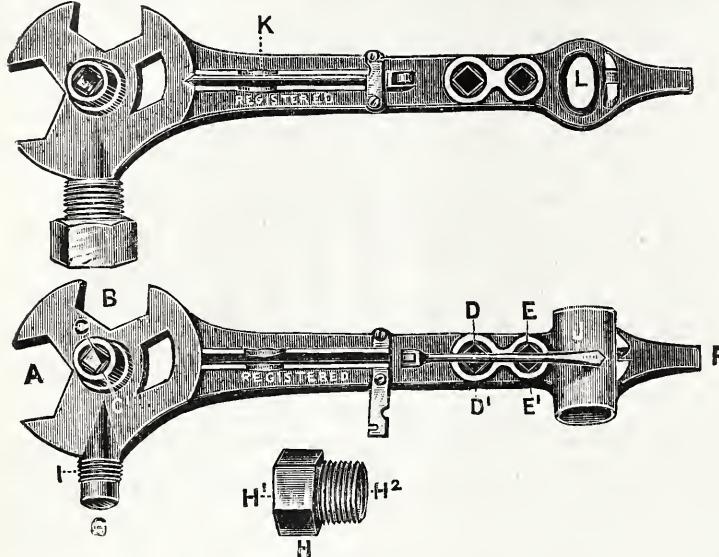
The "B.P. Combination Key" is in stamped steel, case-hardened throughout; the reversible union or coupling H is made in gun-metal.

A To suit Manchester Oxygen Co.'s and other gland nuts.

B To suit Brin's, Birmingham, and Scotch and Irish Oxygen Company's and other gland nuts, also to take reversible union H.

C To suit Manchester, Birmingham, and Scotch and Irish Oxygen Company's, &c., spindles 5-16 in. square.

- C To suit Brin's Oxygen Co.'s, &c., spindles 9-32 in. square, also the advantage of taking 5-16 in. spindle when it becomes slightly worn or rounded on the corners.
 D₁ To suit $\frac{1}{2}$ in. full spindles employed by some gas compressing companies for oxygen and nitrous oxide for dentists, &c.
 D₂ To suit $\frac{1}{2}$ in. bare spindles employed by some gas compressing companies for oxygen and nitrous oxides for dentists, &c.
 E To suit odd or bastard size spindles.
 E₁ To suit odd or bastard size spindles.



It will be noticed that above six different size spindles are provided for, which, we think, is likely to equal everything the operator may require.

- F Screwdriver.
 G Hammer-head
 H Gun-metal reversible union to suit gauge, regulator, or slow valve; the end H' is screwed to fit Scotch and Irish Oxygen Co.'s or other externally screwed oxygen valves, and H² fits the bull-nose or internally screwed oxygen valves of Brin's, Birmingham, and Manchester Oxygen Co.'s, and others.
 I It will be noticed is screwed ($\frac{1}{8}$ in.) gas thread—same as tails of gauges, regulators, slow valves, &c., &c.), to carry the reversible union H.
 J Lime tongs.
 K Lime cleaner; the pin is stiffly hinged and brought to right angles with the lever of key when used to clean out the hole in lime.
 L Wing nut, &c., lever.

Studio Gossip.

SUNDAY PHOTOGRAPHY IN LONDON.—The Sunday street photographer (says the "Daily Chronicle") has been doing good business during the recent fine weather. His clients are chiefly maid-servants out for the afternoon and working men and their families, who are taking their week-end holiday. The "artist's" apparatus is of the most primitive description, and his "pictures" are just such as please an untutored fancy. They are of the tin-type order, and the modest charge is their chief recommendation. The posing of a group, all in Sunday best, at a suburban street corner is a quaint sight. The vagrant photographer knows his audience thoroughly, and his style of adjuring them to look their best, so that he may do justice to them, is a study in itself.

THE POLYTECHNIC.—The winter prospectus of that well-known photographic-teaching institution, the Polytechnic, 309, Regent-street, W., has been issued. From this we learn that the opening night and social re-union will be held on Tuesday evening, October 16, in the large hall at that address. The following is the programme:—7.30 p.m., conversazioni; 8 p.m., exhibition of animated photographs of the latest war pictures, entitled "A Free Trip to South Africa"; 8.40 p.m., the work of the ensuing session, Mr. Howard Farmer; 9 p.m., conversazione. All the teachers will be present, and at either 7.30 or 9 p.m. will be glad to meet old or intending students, and to give visitors information concerning the work of the school or classes. Instrumental music by the Polytechnic Orchestral Band. Admission will be free to artists, photographers, publishers, engravers, and lithographers, and those interested in these trades. The prospectus justly points out that in the area of Greater London the Photographic School of the Polytechnic holds the honourable record that a far greater proportion of those engaged in the various sections of the trade are present or past students of the school than is the case with any other industry and its corresponding school. At

the Polytechnic classes in most branches of photography are conducted by competent teachers. We recommend those of our readers who desire to take up the study of photography at this centrally-situated institution to apply at the address given for a copy of the prospectus.

News and Notes.

THE annual dinner of the Hackney Photographic Society will be held at the London Tavern, Fenchurch-street, E.C., on Tuesday, October 23.

SHEFFIELD PHOTOGRAPHIC SOCIETY.—At the annual meeting of this Society, held last week, Mr. H. Muxlow, of 13B, Steade-road, Sheffield, was elected secretary, vice Mr. G. W. Blackwell, who has retired.

THE YORKSHIRE PHOTOGRAPHIC UNION.—We are informed that the Cleveland Camera Club and the Huddersfield Photographic Society have joined the Yorkshire Photographic Union, which now embraces twenty-one Societies. The Union has our best wishes for its continued success.

ON Wednesday, October 3, Mr. Nightingale, in the course of a demonstration before the Walton (Liverpool) Society, proceeded to develop an exposure made by one of the members on an Ilford Chromatic Plate, two years old. A negative of excellent printing quality, without fog, resulted.

THE PHOTOGRAPHIC COPYRIGHT UNION.—The annual general meeting of the Photographic Copyright Union will be held on Wednesday evening next, October 17, at the Cafe Royal, Regent-street, W., at eight o'clock. Important reports with reference to the proposed new Copyright Bill and the work of the Union will be presented.

GLUE OR GUM.—It is sometimes needed to differentiate these substances in some photographic preparations, and for this purpose a simple method has been discovered by Herr Hugo Borntrager. The substance is heated with 50 per cent. of hydrofluoric acid. If glue or gelatine be present the odour of butyric acid is at once perceived.

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.—At the annual general meeting of this Society the following officers were elected for the ensuing year:—Chairman, Mr. F. W. Bannister; vice-chairman, Mr. R. R. Rawkins; hon. treasurer, Mr. E. G. Hawgood; hon. lanternist, Mr. J. E. Hoar; hon. assistant secretary, Mr. H. A. Norman; hon. secretary, Mr. P. C. Cornford, 103, Borough-road, S.E. The Loan Collection of Members' Slides were shown on the opening night of the winter session, prior to the set being sent round for exhibition at other Societies' meetings throughout the country. The hon. secretary informs us that he has still a few open dates for these slides, which he will be glad to book on application.

THE photograph plays a great part in a work of which Messrs. Hutchinson will publish the first part on Monday. It is a popular account of the living races of mankind (says a contemporary), and is edited by Mr. H. N. Hutchinson, with the assistance of Dr. Gregory, Mr. Lydekker, and other specialists. Portraits for it have been collected from all parts of the world; in simple fact, they have been gathered from China to Peru. Taking the case of the Samoans, there is even a picture of Robert Louis Stevenson's cook, a handsome fellow, who was no doubt a warrior in his spare hours. Our art authorities rather complain that the photograph is being overdone in illustrations. Here, however, is a case where it has a value not to be secured by other means.

MR. GEORGE RUMKER, of the Hamburg Observatory, has been conducting some interesting experiments with a view to measuring the length of a flash of lightning. During a thunderstorm, a few weeks ago, he had set up his camera, and succeeded in recording upon his photographic plate a flash of lightning, which struck a tower about 550 yards distant from his camera. From the distance he was from the tower, and the focal distance of the camera objective, Mr. Rumker succeeded in calculating the breadth of the flash, which was one-fifth of an inch. On each side of the main flash of lightning are seen many ramifications, which Mr. Rumker attributes to the strong gale that was raging at the time; but they have imparted to the discharge the curious effect of a ribbon torn to shreds.

THE Hove Camera Club's Fifth Annual Exhibition will be held at the Town Hall, Hove, on Thursday, Friday, and Saturday, November 22, 23, and 24, 1900. The judges will be Messrs. Charles Job, E. E. Manwaring, and W. Bond. The open classes are as follows:—(a) Landscape and marine, silver medal presented by the Mayor (Alderman J. Colman); (b) figure and portraiture, silver medal presented by A. R. Sargeant, Esq.; (c) architecture; (d) any other subject than the above, bronze medal presented by Charles Job, Esq.; (e) lantern slides (any subject) in sets of four; (f) a set or sets of four pictures by exhibitors who have never gained an award in photography, silver medal presented by Mrs. A. O. Jennings. In each of the above classes silver and bronze medals and certificates will be given. Entry forms and further particulars can be obtained from the hon. secretary, Mr. C. Berrington Stoner, 24, Holland-road, Hove.

A NOVEL USE FOR THE X-RAYS.—A contemporary states that the X-rays have been subjected to a novel purpose in Calcutta. A thief was supposed to have stolen a diamond worth 10,000 rupees, and to have effectually secreted it on his person by swallowing it. Expert thieves in India temporarily secrete small valuables of this description in the throat. It is called "pouching," and the thieves undergo special training in order to render them proficient in the art. The plan is very simple. A small piece of lead is attached to a thread, and this the neophyte

swallows; then by the action of his tongue he guides the lead to the orifice of the sac in the throat. The pupil is prevented from completely swallowing the lead by the piece of thread which the teacher holds. When the man has become skilful in this act of swallowing, the leaden pellet is coated with lime, which has the effect of enlarging the sac so that it becomes capable of retaining large articles. In the case of Calcutta the Rontgen rays revealed the presence of some obstacle in the throat, but its precise identity could not be gathered.

THE IMPORTANCE OF COMMON SENSE.—The address introductory to the autumn session of the Royal College of Science, which preceded the distribution of prizes last week, was given by Professor C. Le Neve Foster, D.Sc., in the lecture theatre of the Victoria and Albert Museum. He took as his subject "The Value of Common Sense." The common-sense man, he said, was not tied down by theory; he did not feel bound to follow the methods handed down by his forefathers; he was always on the look-out for improvements. Students should value their present opportunities for acquiring knowledge, which, if neglected, might never recur. What the scientist did to-day the manufacturer did to-morrow, and the experiments made in the laboratory soon became regular processes of manufacture. Though he had chanted the praises of common sense, he concluded, there was something nobler than the acquisition of knowledge merely with a view to making money. There was the suppression of the love of self, and the cultivation of the love of one's neighbour, which should develop into love of one's country.

A LADIES' PHOTOGRAPHIC COMPETITION.—From a preliminary circular that has been sent us we learn that a grand exhibition of needlecraft, wood-carving, photographs, etc. (under the auspices of the Worcester Diocesan Girls' Friendly Society), will be held at Stratford-on-Avon in May or June, 1901. Prizes will be offered for exhibits in twenty-four classes, of which the following three will be of especial interest to lady photographers:—T. Photographs: (1) Marine views and landscapes, 10s., 5s.; (2) interiors and architecture, 10s., 5s.; (3) portraits and figure studies, 10s., 5s. U. Snapshots: (1) General work, 7s. 6d., 4s.; (2) moving objects, 7s. 6d., 4s. V. Transparencies and Lantern Slides, 5s., 3s. W. Set of three Photographs illustrating Shakespeare, Tennyson or Browning, 10s., 5s. The following are the principal rules for exhibitors:—Exhibits for competition must be the sole work of the exhibitor, and must have been executed since January, 1900. An entry fee of 1s. will be charged for each article sent in. Class T is confined to work done with a stand camera, no limit as to size. Preference will be given to prints with a matt surface. Class U is for hand camera work only, but Classes V and W are not restricted in any way. Photographs in Classes T and U must be mounted separately, and all photograph exhibits must be ready for hanging, but need not be framed. The hon. secretary of the exhibition is Mrs. Arbuthnot, The Vicarage, Stratford-on-Avon.

Commercial Intelligence.

Secco Films (British and Colonial), Ltd., 39, Lombard-street, E.C., have arranged for their demonstrator to give a series of lectures to the members of the principal Photographic Societies and Camera Clubs, and request that Secretaries will furnish a list of vacant dates to the Manager of the Company.

Messrs. G. W. Wilson and Co., Ltd., of Aberdeen, are issuing a series of lantern slides illustrating the Life of Admiral Lord Nelson. Many of the slides are from photographs taken specially for this set of authentic portraits, scenes, incidents in Nelson's career, relics, &c. Eleven of the slides depict the beautiful Lady Hamilton, Nelson's "friend," which should add some piquancy to the lecture.

The Warwick Trading Company, Ltd., of 4 and 5, Warwick-court, High Holborn, W.C., whose motto is "Progress, push, and promptness," send us a copy of their latest catalogue. This is a book of 160 pages, about forty of which are devoted to illustrated descriptions of the Company's specialities in apparatus, and the other 120 to a list of films, which are specified in amazing variety. The catalogue, which is a tribute to the wonderful success of the Company, should be in the hands of all interested in cinematography.

Patent News.

THE following applications for Patents were made between September 24 and September 29, 1900:—

PHOTO-COPYING MACHINES.—No. 16,957. "Improvements in Photo-copying Machines." H. O. FOERSTERLING.

COPYING MACHINE.—No. 16,958. "Photographic Copying Machine." H. O. FOERSTERLING.

CAMERAS.—No. 17,044. "Improvements in Cameras." Complete specification. P. N. ANGSTEN.

DISHES.—No. 17,205. "Improvements in Developing Trays or Dishes for Photographic Films." B. M. ROGERS.

LENSSES.—No. 17,313. "Improvements in the Manufacture of Lenses." W. E. BARRAS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
16.....	Aintree	A Pictorial Exhibition. F. Anyon.
16.....	Birmingham Photo. Society	{ Demonstration: Some Novelties in Velox and the New Developer Kachin. D. A. Nightingale.
16.....	Bootle	{ Demonstration: Platona. J. M. Dulahan.
17.....	Borough Polytechnic	Lantern Night.
17.....	Croydon Camera Club	{ Lantern-slide Making on the Gelatine Plate. Benjamin E. Edwards.
17.....	Photographic Club	{ Some Difficulties in Carbon Printing. E. W. Foxlee.
17.....	Redhill and District	{ Demonstration: Cristoid Films. Sandell Company, Limited.
17.....	Woodford	Annual General Meeting.
18.....	Liverpool Amateur	{ Demonstration: Retouching. F. A. Cooper.
18.....	London and Provincial	Monthly Competition: Landscapes.
19.....	Bognor	Instruction Evening: Developers, their Use and Abuse.
19.....	Borough Polytechnic	Photographic Chat.
20.....	Croydon Microscopical	{ Visit to the Royal Photographic Society's Exhibition. Leader, W. H. Rogers.
20.....	Croydon Camera Club	

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 9, Ordinary Meeting, Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

NEW MEMBERS.

Nine new members were elected, and about twenty-five candidates for membership were nominated. It was announced that the Farnham and District Photographic Society and the Amateur Photographic Association of Tunbridge Wells had been admitted to affiliation.

THE PRESIDENT ON THE EXHIBITION.

The President, before proceeding to present the medals awarded by the Judges at the Exhibition, said he wished to say a few words upon the subject of the Exhibition itself, which he regarded as the most successful annual display which had ever been held by the Society. The New Gallery afforded opportunities for such a classification of exhibits as was not possible at Pall Mall, and enabled the Society not only to give prominence to pictorial photography, but also to its many scientific applications. In 1898 the Earl of Crawford, their President, emphasised the importance of the commercial aspect of professional photography, and pointed out that it was the duty of the Society to aid and to foster it. Major-General Waterhouse, who at that time occupied the position of Hon. Secretary, in his characteristically unostentatious manner, at once set to work to find premises in which the scope of the Exhibition might be enlarged, so that its aims and objects might be more perfectly fulfilled, and it was to him that the Society was mainly indebted for the facilities afforded by the location of the Exhibition at the New Gallery. The present collection was notable as a landmark in the evolution of pictorial photography, not only in respect of the small number of medals awarded, but also with regard to the very high average of the exhibits and the absence of really poor work. There had been generally a great levelling up in all classes of the work, and the original impetus given by the leaders of new departures in pictorial photography had apparently well-nigh fulfilled its purpose. After looking round this section of the Exhibition one was struck by the fact that a good deal of it was reminiscent, but that on the whole a very high level had been attained. Notable advance in pictorial photography was at the present time a difficult goal to gain, and it must be confessed that no such advance had been made in 1900. The President thought the day had come when it might be considered a great honour to be hung in the Exhibition at all, and a very great honour indeed to obtain the Society's medal, a remark which was justified by the fact that the pictorial section comprised some 350 exhibits, while nearly a thousand frames were rejected. It was gratifying to find that professional photographers had so readily availed themselves of the opportunity which had been afforded them, and had contributed a magnificent display, and it was to be hoped that on future occasions more professional work would be submitted for acceptance in the pictorial section. The scientific, technical, and photo-mechanical exhibits numbered over 200, and were certainly of a deeply interesting and instructive nature. He hoped that in years to come this section would be still more comprehensive. Photography was pre-eminently the handmaid or the pioneer process of investigation in every branch of science, and it was fitting that the work carried on in wider scientific fields should find its representation in the Exhibition of the Society whose main object was the advancement of photography itself. The awards in the competitive technical section were of singular interest in connection with the popularisation of photography. The subject of the dissemination of faithful photographic reproductions of rare and beautiful objects was dealt with in the late President's address, in the course of which he expressed the hope that before long the Government would set up an establishment, primarily devoted to photography, for the service of the national museums. Photogravure was not a new method of reproduction, but the award in that section was evidence of the fact that the Society was on the alert to recognise distinguished merit in photo-mechanical processes. Referring to the award of a medal to Kodak, Ltd., for the Panoram Kodak, the President said it was a source of particular pleasure to him that such an ingenious piece of mechanism had been so successful, for he felt that Mr. George Eastman had done

more than any other man in this generation to popularise photographic practice. The Panoram Kodak recorded the image in cylindrical perspective. From a scientific point of view, such a picture should not be viewed upon a plane surface; but the sensuous impressions conveyed by the instrument were more pleasing than photographs taken by a lens of the same focal length and including the same angle. This arose primarily from the fact that small photographs were almost invariably viewed beyond the station-point, and in that case it was to be expected that the Panoram pictures would be more pleasing. At former Annual Exhibitions the apparatus section was restricted to improvements of a distinctly novel character, but the facilities afforded for a more comprehensive show on the present occasion were, he was sure, highly appreciated both by the manufacturers and by the public.

The President, at the conclusion of his remarks, handed to Mr. George Davison the medal awarded to Kodak, Ltd., for the Panoram Kodak. In the pictorial section medals were awarded to Mr. Percy Lewis, for his picture "Venice," and to Mr. W. T. Greatbach, for "The Orchard"; and in the technical section to Messrs. T. and R. Annan and Sons, for photogravure reproductions of paintings by Sir Henry Raeburn; but these exhibitors were not in attendance.

THE PRESIDENT'S ANNUAL ADDRESS.

The President next proceeded to deliver his annual address. The present status of photography as a science, in common with all other sciences, had, he said, been brought about by the classification of facts, their sequence and significance; and as photography is scarcely a century old, one was able to trace with considerable accuracy both the chemical and optical progress of the science from the earliest qualitative experiments to the present qualitative scientific process. The close of the century was a particularly appropriate period at which to review this progress, but in the short time which could be devoted to an address it was impossible to do justice to a subject so vast, or even to any particular branch of it. He proposed, therefore, to give a brief account of the evolution of modern lenses, but the inter-connection of chemical and optical work at the commencement of the century was so peculiarly interesting that he would include a few references to emphasise their early interdependence. Chemical changes due to the action of light had been known for upwards of 2000 years, and were referred to by Aristotle about 350 B.C., and by Vitruvius about 75 B.C. The first public exhibition of photographs took place at the Royal Institution in 1802, when Wedgwood showed photographs on paper and white leather, either unfixed or only partially fixed. The researches of Wollaston, Niepce, and Chevalier were referred to, bringing the subject down to the epoch-making investigations of Petzval, who in 1840 described how he had removed the correction of photographic lenses from the plane of experiment, or trial, and error, to a definite mathematical and scientific basis. From this point the President proceeded to trace the evolution of modern landscape, portrait, triple, doublet, and telephotographic lenses, dealing very comprehensively with the advances made in each type, and describing in chronological order the work of Petzval, Voigtlander, Grubb, Goddard, J. H. Dallmeyer, Rudolph, Andrew Ross, Steinheil, Schroeder, Aldis, Dennis Taylor, Morrison, Davidson, Von Hoegh, Von Rohr, Kaempfer, Miethe, himself, and others. For his address, which will form a very valuable addition to the history of photography, the cordial thanks of the Society were given to the President, upon the motion of Mr. Chapman Jones, seconded by Sir H. T. Wood.

COMING EVENTS.

At the Technical Meeting to be held at the New Gallery on October 23, Mr. Thomas Manly will give a demonstration of the Ozotype Printing Process. On November 6, at No. 66, Russell-square, Mrs. Aubrey Le Blond (formerly Mrs. Main) will open the winter series of Lantern Evenings with a lecture on "Cities and Sights of Spain." At the Ordinary Meeting, on November 13, Mr. E. Walter Mauder will read a paper on "Photography of the Eclipse of May 28, 1900." The Traill-Taylor Memorial Lecture will be delivered on November 16, at 66, Russell-square, by Mr. F. E. Ives.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 4, Mr. A. Mackie in the chair.

The Hon. Secretary, Mr. W. D. Welford announced that as he would be away on several subsequent Thursdays, Mr. T. E. Freshwater had kindly consented to be Acting Hon. Secretary at the meetings, at which Mr. Welford would be absent.

Mr. Freshwater showed two 4-plate negatives on Thornton film, one of which had come away from its support in the washing, and had stretched perfectly to 5 by 4.

Mr. E. Featherstone showed two prints on the new Matt Carbona paper, one being toned to a blue-black and the other to a warm sepia, the toning bath employed being:—

Phosphate soda	...	...	...	...	...	15 grains.
Gold chloride	...	...	...	...	...	$\frac{1}{2}$ grain.
Water	...	...	...	...	...	14 oz.

Mr. A. L. Henderson gave a lecture on "Bordighera, New and Old," illustrated by a number of very excellent slides.

PHOTOGRAPHIC CLUB.

OCTOBER 3, Mr. E. W. Foxlee in the chair.

The exhibits of the Selke Photo-Sculpt Co. at the New Gallery were the subject of some discussion. They take the form of bas-reliefs in plaster or metal, the moulds for which are produced by photographic means. It was stated that a cinematograph camera was used, and some forty or fifty exposures made upon the sitter's face, lighting being varied in a special manner during such exposure. Enlargements are then made

from the negatives, and from these are cut out certain parts, which, all mounted in order one upon another, yield a model of the sitter's face, from which in turn, after retouching, finished moulds can be produced.

The Chairman referred to a method of making bas-reliefs by an old swelled gelatine process, but the difficulty was to get sufficient relief in this way to make it show at all. There was also a German method by which a swelled gelatine mould was made, and from that a plaster cast. This cast is dug out wherever greater depth is required, and then a wax mould taken. This is served in the same way, and eventually a finished mould is secured.

Brentford Photographic Society.—Third Annual Meeting, Oct. 3, the Rev. T. Eland (president) in the chair. The Hon. Secretary read the report of the Committee as follows:—"Another successful year has been completed, and we begin our third year of existence under most auspicious and satisfactory circumstances. Outsiders are beginning to take an interest in us and our doings. The outings have been successful with one exception—the one to Laleham, which had to be abandoned, the date fixed (the middle of July) being far too near the holiday season. The last annual exhibition was a complete success as regards the number both of visitors and exhibits. Financially also it succeeded, and everything points to the necessity of holding the next one in a larger and more suitable hall, such as the large public baths' hall, which, with its gallery, seems specially suited for the purpose. It is hoped that the Society will increase this year, and enable the Committee to provide in an able manner for the wants of all classes of photographers. Your Committee will lay before you a well-thought-out syllabus, prepared after much trouble, as it was thought advisable to get as many outside workers as possible to contribute. They would suggest that members bring their failures or faulty work to be criticised, and have the mistakes pointed out. Then these could be corrected, and a good print obtained and prepared ready for the exhibition. The same thing applies to lantern slides. The Society, being affiliated to the Royal Photographic Society, will be expected to comply with the new rules concerning exhibitions. The Society has been again indebted to the managers of St. Paul's Schools for the use of the class-rooms for meetings. The question whether a change of meeting-place would be advantageous has been raised. The Society is not in debt, having a balance in hand of about £1 to date (Oct. 1, 1900), but the changes advocated will necessitate a larger income; and the Committee therefore suggest that for the efficiency of the Society's work, the advisability of raising the subscriptions should be considered."

The following were elected officers:—President, Rev. T. Eland; vice-presidents, Rev. Percy West, Mr. F. A. Turner, F.R. Hist. Soc., Mr. A. R. Read; hon. secretary and treasurer, Mr. H. Grundy, of whose services the Chairman spoke in very high terms. Committee: Mr. A. R. Read, jun., Mr. W. J. Squires, Mr. Bonfellow, and Mr. Wilfred Liveridge.

Croydon Camera Club.—Following the custom of former years, the eleventh winter session of the Club was inaugurated on Wednesday last by an address from the President, Mr. Hector Maclean, F.R.P.S., in the course of which he touched upon a number of topics of interest to members and to photographers at large. He congratulated the Club upon the interesting outings which had been held during the summer, including visits to Cuckfield Place, Gattan Hall and Park, the home and haunts of Dickens, and a trip up Thames, which latter attracted an attendance of nearly sixty members and friends. As regards the future, a brilliant programme of photographic events was outlined, not the least interesting being the visits of parties of members to the R.P.S., under conditions as regards guidance and admission not generally obtainable. The lantern shows will be more frequent this year than last. Besides the technical fixtures and the annual dinner, it is contemplated to hold a Club concert and also a Club Cinderella. The fourth exhibition is promised for February 20, apropos of which Mr. Maclean plunged into the depths of pictorialism, emphasising that you cannot stumble upon pictorial effect, but must aim for them, and to hit the mark must train the eye and judgment. In the course of further remarks, he dwelt on the works of D. O. Hill, who nearly sixty years ago produced, on calotype, a series of pictorial portraits that held the field for a good quarter of a century. Hill was an artist. The next man heard of—viz., Rejlander—was also an artist, and going through all the well-known names one can scarcely discover any but those who have some considerable art familiarity. But of recent years photographers have trained themselves more by means of the camera than with the brush. Mr. Maclean illustrated his remarks by a large assortment of prints by Hill, Rejlander, and by exhibitors at the lately opened exhibitions, and delivered his opinions upon them as they were displayed. Respecting the two chief exhibitions, he stated that his own preference, as regards landscape only, was that the most meritorious one in the R.P.S. was "After Rain—Evening," by Mr. Charles Job, which was pitched in a delicate half-tone, showing slight coming through haze which softened a riverside landscape. In the above, neither diffusion nor obscurity had been pushed to an extreme. In "The Salon" his preference leaned towards Mr. Charles Moss's gum-bichromate studies. Without bestowing the crowning term "perfect," he admired them, in that they showed design and a large measure of attainment. They evidenced that Mr. Moss is not satisfied to repeat the effects and means of former years. Following the President came a well-arranged demonstration by Mr. Lionel G. Kough, on carbon slides. The lecturer, who is one of the Club's most popular and distinguished technicians, briefly sketched out the advantages of carbon tissue for the production of lantern slides. Not only is it absolutely unchangeable, but it is cheaper and more certain; the results are also not less perfect, and the range of colour very considerable, and yet absolutely constant—a great advantage where a series is required of a particular tint. Following the ex-

planetary remarks was a demonstration of the chief points in procedure. This was carefully noted by a gathering of some thirty members, who subsequently plied Mr. Kough with innumerable questions. In proposing a vote of thanks, which was adopted with a heartiness that indicated that not only the lecture but the lecturer was greatly appreciated, the President said they were particularly beholden to Mr. Kough for giving the session such a good send off. The Club had always endeavoured to provide most of their photographic fare from their own members, and while they could get such demonstrations as that night the policy would be followed with great advantage to all concerned.

Liverpool Amateur Photographic Association.—Oct. 4, Mr. Fred Anyon gave a practical demonstration on "Photography for Beginners." He first explained the various parts of the camera, and then went on to deal with exposures. By the aid of several slides which were thrown on the screen the valuable use of stops was clearly illustrated, also the use of a wide-angle lens. Mr. Anyon then dealt with development, printing, and toning, and gave several formulæ.

FORTHCOMING EXHIBITIONS.

1900.	
October 12-Nov. 3	... Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
" 12-Nov. 3	... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
" 17-20	..... Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.
" 30-Nov. 3	... Sefton Park Photographic Society. Hon. Secretary, G. Birtwhistle, 7, Gainsborough-road, Sefton Park, Liverpool.
November 7-10	..... Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
" 12-17	..... Ashton-under-Lyne.
" 19-24	..... Waterloo and Blundellsands Photographic Society. Hon. Secretary, W. G. Eyre, 2, Mersey-road, Blundellsands.
" 21-23	..... Hackney Photographic Society. Hon. Secretary, W. Selfe, 70, Paragon-road, Hackney, N.E.
" 21-24	..... Cleveland Camera Club. Hon. Secretary, F. W. Pearson, 98, Victoria-road, Middlesborough.
" 22-24	..... Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.
1901.	
January 14-19	..... Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

LEVELLING THE HAND CAMERA.

To the Editors.

GENTLEMEN.—In using a stand camera the camera back is commonly set vertical by a spherical level. Many photographers also have levels on their hand cameras, and they are very useful, though it is rather distracting to glance from the finder of the level while holding the camera in the hand. It adds one to the other causes of nervousness in taking hand camera pictures.

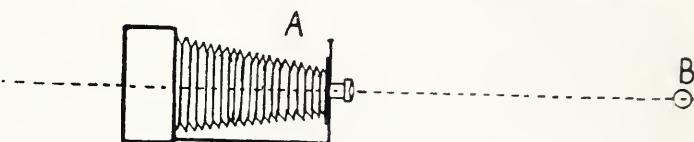
Recently I obtained a hand camera which did not seem to afford any convenient position for attaching a level, and besides had sloping bellows and a swing back, which make it practically very difficult to judge of the horizontality of the camera axis. It occurred to me that a line on the finder would answer the same purpose as a level, and would be in many respects in hand camera work more convenient. Set up the camera A, with its back vertical, square, for instance, to a level table. At a convenient distance set a mark (B) level with the camera axis. The edge of a window sash is a convenient mark, as it can be adjusted in height. Now draw a line on the finder at the image of B. In taking a view choose any point in the view level with the camera, and bring this to the line on the finder. The camera axis is then level. There is only the finder to look at, and it is possible to see also that vertical lines are parallel to the picture sides.

Next as to the swing back. If two lines are drawn on the finder in the way described above, one with no swing used, and one with full swing, the camera can be levelled for these positions by bringing a

point level with the camera to the corresponding line on the finder. Intermediate positions can be judged. At half-swing the level point must be midway between the lines on the finder.

Since I tried this dodge I have had a level fitted to the camera. But, on the whole, I think that for ordinary hand work the lines are more convenient, and they show differences of level more sensitively than the ordinary small levels fitted to cameras. There are cases, no doubt, when the level has the advantage.

Very probably this simple dodge has been used by others, and, of



course, some finders have lines on them. But I have not seen in print any reference to these two points:—(1) That the line on the finder should be on the image of a point level with the camera centre; (2) that in using the line a point level with the camera should be chosen to the image of which the line should be brought.—I am, yours, &c.,

W. C. UNWIN.

Palace Gate Mansions, 29, Palace-gate, Kensington, W.
Oct. 6, 1900.

GELATINE LANTERN SLIDES—CINEMATOGRAPHY.

To the Editors.

GENTLEMEN.—Some time ago an inquiry, which I think has remained unanswered, appeared in your columns about gelatine magic lantern slides. At the time I could not put my hand upon the information wanted. Now, however, I can give an address.

Reinhard Kluge, 13 Schlossergasse, Dresden—A, has such slides of which I enclose you a sample. I should say there are probably manufacturers of such things to be found in Nuremberg.

The first time apparatus of the nature of a cinematograph was exhibited in public was, I believe, at an exhibition of arts or industries at Brussels some ten or fifteen years ago.

It seems to have attracted but little attention (flexible transparent substratum, for photographs was perhaps not then in existence). It was (subsequently, I think), referred to in one or two English photographic periodicals.

I should be most grateful to any one for information or references, which would enable me to trace out this matter, before it sinks into hopeless oblivion.—I am, yours, &c.,

PHOTOGRAPHIC.

[We are much obliged to our correspondent for the specimen of the coloured gelatine transparency—the like of which, however, is fairly common in this country. With regard to early cinematograph displays, we are unable to trace a reference to the Brussels Exhibition, but our correspondent will find much information on the general subject contained in Mr. Henry V. Hopwood's most admirable book, "Living Pictures," published at the office of "The Optician," 125 Fleet-street, E.C.—Eds.]

NATURAL COLOUR PHOTOGRAPHY AT THE R.P.S. EXHIBITION.

To the Editors.

GENTLEMEN.—The fact that the New Gallery is only lighted from the roof created a difficulty in showing in a proper light the first photographs, eighteen in number, ever seen in this country, taken in America by the McDonough-Joly process. This difficulty has only now been surmounted, the photographs being placed on the balcony facing the entrance, where we trust you will inspect them.

The fact that the Government Geologist of the Department of the Interior of the United States, is at the present time using the process in photographing geological formations in the Rocky and Cascade mountains for their geological surveys, is perhaps the best proof that can be given that photography of natural colours has now passed the experimental stage.—We are, yours, &c.,

COLOUR-PHOTO CO.

Birkbeck Bank Chambers, Southampton-buildings, Holborn, W.C.

PHOTOGRAPHIC HALATION (POSTERIOR); EXPOSURE THROUGH THE GLASS PLATE.

To the Editors.

GENTLEMEN.—With some photographers there seems to be some considerable confusion of ideas respecting the principles involved in the phenomenon of photo halation (posterior), which may be rectified very easily by a little reflection concerning the manner in which it is produced, and the nature of the materials employed when the fault is sought to be remedied by exposing the plate or film at the back.

You cannot have a glass plate without two outer surfaces, and, so to speak, two inner surfaces, the uncoated surface having a backing of air, and the film surface a backing of bromide, &c. Now, the light striking the back of the glass, supposing we have the film side the opposite way in the dark slide during the exposure, a portion of the light is reflected, and a portion passes on to the sensitive film forming the image, but a portion is also reflected from it into the glass and passes on to the reflecting surface of air at the back of the plate. This reflects a portion back again on to the back of the film, and exposes it in a diffused form over the adjacent shadows of the picture. As the film is of a pale primrose colour, the active rays of light falling on it in this manner are reflected backwards and forwards during the whole of the exposure, strengthening and extending the effect during the whole time. This has now passed out of the region of theory into actual fact some considerable time. Some writers seem to ignore the fact that the sensitive film in contact with the glass becomes an internal reflecting surface when it is exposed through the glass plate. This, I think, is at the root of the mistaken idea.

The principle here involved was first enunciated by the writer as far back as 1861, and it still holds its ground against all comers, though violently opposed at the time by the magnates of photography, and who at the present time would, if they could, obliterate my name from all connection with the subject altogether, as seen by their own extensive writing on the subject since then, and their present attitude. For why, I know not, unless they are ashamed of the behaviour of their brethren in those far off times. But this, you would think, if they were ordinary human beings, they would be only too glad to rectify. Forty years is a long time to wait for recognition from the parent Society, and when this was suggested to them a year or two ago it was treated with silent contempt by ordering it to be laid on the table, which meant shelve it. Of course, the above refers wholly to posterior halation, which is the result of quite a different set of circumstances to that of anterior when the plate is exposed in the usual way, from motes in the air around windows, &c.—I am, yours, &c.,

G. MARLOW.

80 Lower Sutton-street, Aston-road, Birmingham, Oct. 8, 1900.

THE ALMANAC.

To the Editors.

GENTLEMEN,—For many years back I have had the ALMANAC, and ever since it has grown so fat I have thought that if you could place two stout leaves just at the start and finish of the matter, to divide the advertisements, one could cut through the thick back of the ALMANAC and have a nice-sized book to read. One could save the advertisement part all the same. I do; for four years I have cut through and saved each part. I like to take my ALMANAC to bed for a few weeks and the whole lot is rather heavy to hold up.—I am, yours, &c.,

VACUUM CAPUT.

[We are pleased to learn that our correspondent, an old photographer, finds the ALMANAC such a pleasant bed-fellow! Just now we are in receipt of many suggestions with regard to the make up of the book, few of which, however, are practicable. Nevertheless we thank our friends for their communications. The book, of course, will not be in the hands of the public for at least seven weeks, and yet each day we are favoured with many good wishes for its success.—EDS.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

A. Tear, 5, Westgate-street, Ipswich.—Four photographs of Captain G. Prettyman, M.P.

T. P. BROWN.—The house you name is of the highest respectability, and, of course, still carries on business.

FORMULA WANTED.—T. writes: "Can you give me formula for gum or paste to put on back of stamp-size photos?"—Ordinary dextrine, as sold at the oil shops, made into a mucilage, is as good as anything. A trace of glycerine may be added with advantage.

GEO. MINNS.—We should say, under the circumstances, that the Velox, or other of the gaslight papers, would answer your purpose best. With them you will be able to produce the prints throughout in an ordinary room in the evening. With these papers no dark room is required, and various colours can be obtained.

BOOKS ON PHOTOGRAPHY.—E. CASSON writes: "I have only six months longer before I try for a position as assistant operator and developer. Would you kindly inform me what books I can get which will give me some good advice about posing, lighting, and developing, &c.?"—In reply: Robinson's "Studio, and What to Do In It," Inglis's "Lighting," Henry's "Early Work in Photography," should be of help to you as a start. You may obtain these works of Messrs. Dawbarn and Ward, 6, Farringdon-avenue, E.C.

PAPER FOR TAKING COLOUR.—E. D. asks: "What is the best printing paper for taking water colour? I have tried oxgall for the Ilford matt surface paper, but the result is always more or less smoky. Is there a coarse kind which would take the colour better and have a similar effect to Whatman's water colour paper, and does it require any special process of printing for finishing in water colour?"—We should recommend one or other of the rough bromide papers, or the gaslight papers of the Velox type. Some of them have a surface very like the Whatman papers, and take colours easily.

COPYRIGHT.—A REGULAR SUBSCRIBER asks: "How am I to go about copyrighting a photo? What is the address of the Secretary, the fee for doing so, and how many photos have I to send up, and are they to be on permanent paper? Am I to give the title, or simply only register the negative; and am I bound always to keep to the registered title of the photo?"—In reply: If our correspondent read his JOURNAL a little more carefully, he would have seen that only a fortnight ago we gave full particulars of the course to be adopted in registering photographs. However, let him send our publishers two prints, and 1s. 7d., and they will do the needful for him.

ADDRESSES WANTED.—F. T. TILLEY asks: (1) Where he can obtain small directories of British Colonies, as he wishes to advertise English views abroad. Also (2) the address of a firm who supply views 12 by 10 on plush blocks at wholesale prices.—In reply: (1) With regard to advertising in the Colonies (for that, we take it, is what our correspondent wishes to do), some such firm as George Street and Co., of Cornhill, E.C., or Street Bros., of Serle-street, Lincoln's Inn, would, no doubt, give advice. They might also indicate where the directories required are obtainable. (2) Messrs. Marion, Soho-square; Houghton and Sons, Holborn, and other firms who advertise in the JOURNAL and ALMANAC supply such goods.

COLLODIO-CHLORIDE PAPER.—B. asks: (1) "What are its disadvantages compared with matt bromide paper for prints from small negatives? (2) White Ink Insoluble in Water.—Is there such an ink for numbering negative cut films so that if later washing be required the numbers will remain? (3) Temperature of Developers.—Is there any good developer which works naturally much below 60°F? In winter it is not easy to get a room not used for other purposes (in a private house) up to 60 to 65, as recommended for hydroquinone, kachin, &c."—(1) None that we are aware of. (2) If oil colour paint, such as is sold in tubes for oil painting, be used, it will resist the water, if allowed to get perfectly dry before the films are re-wetted. (3) The developers will work quite well at a lower temperature than that mentioned, but they will require a longer time for their action.

PORTRAITURE BY INCANDESCENT GASLIGHT.—LIGHT says: "I should feel obliged if you will inform me the candle power I should require to take portraits by incandescent gaslight (Welsbach), using Voigtlander portrait lens, at full aperture, and Barnet E.R. plates, giving about three seconds' exposure. I intend having several plates mounted in an umbrella-shaped reflector. Should mantles be used with or without glass shades?"—We cannot say the candle power required by gaslight to take portraits in the time stated, with the plates and lens mentioned, as we have had no practical experience in that direction. Much will, however, depend upon the distance the light is from the sitter. The arc electric lights generally used for portraiture are from six to ten thousand candle power, and require an exposure of from one to two seconds when placed some distance away from the sitter. This may possibly serve as a rough guide. We should say the lights had better be used with a glass.

MICROPHOTOGRAPHY, &c.—W. E. PARKIN writes: "May I ask if you would kindly advise me as to the following:—(1) What apparatus is required for reducing say $\frac{1}{2}$ -plates for microscopic slides, similar to the pictures sold with penholders and at seaside places? (2) What book is sold dealing with this subject, and giving hints, &c., for developing, &c.? (3) Could you give me the name of any firm doing this work from amateurs' negatives, with cost of same? (4) Is it possible to purchase view finders which could be used for taking pictures on a $\frac{1}{2}$ -plate instantograph, where, as in passing views at sea or on board ship, there is no time to focus, &c., and to avoid both a hand and stand camera because of extra baggage?"—In reply: (1) A copying camera, in miniature, similar to those used for making lantern slides from larger negatives, fitted with a microscopic objective of low power, say an inch or inch and a half. With it use the wet collodion process. (2) We know of no work devoted to the subject. (3) Dagron, of Paris, produces this class of picture. We do not know the price charged. (4) Not that we are aware of. Why not employ a hand camera fitted with a scale to which the focus of the lens can be adjusted for different distances? That would overcome your difficulty.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 2111. VOL. XLVII.—OCTOBER 19, 1900.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

THE ALMANAC for 1901 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages for the 1901 ALMANAC. Those of our friends intending to co-operate with us in this respect can help us by letting us have their MS., sketches, &c., in the course of this month.

We shall be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c.

As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us at once.

* * * The publishers ask us to remind advertisers that most of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them by Tuesday, October 23rd.

* * * Will secretaries of societies who have not yet sent us lists of officers for inclusion in the ALMANAC kindly oblige us by doing so by return in order that this section of the book may be proceeded with.

EX CATHEDRÂ.

It frequently happens that a photographer is called upon to execute orders in floral photography in which more or less difficulty is experienced in being able to arrange for a satisfactory method of holding some particular subject *in situ*, and this difficulty crops up quite as often in well-appointed conservatories and greenhouses, where any one would expect to find the utmost convenience for conducting such work, as elsewhere. In photographing what may be termed pot or foliage plants, where no great amount of size has to be contended with, the difficulty generally lies with that class of plants whose form of growth does not permit of their being placed upon a solid iron stool or other rigid support, which can be arranged in position at the most suitable part of the greenhouse, so that the best effects in light and shade may be obtained. A notable example of this kind of subject we find in the pitcher plant, with its overhanging and trailing growths, as seen in its marvellous formation of little water vessels or cups, which are frequently found suspended several feet below the basket containing the root, or body of the plant. It is well known that these wonderfully-formed plants require a very high temperature, and the work of photographing has often to be performed in what are termed stove-houses, with a temperature of 90° F., so that special precautions must be taken to guard against any sweating of the lens, for extreme moisture is always present in these stove-houses. The pitcher plant is just one of those subjects that

can only be properly dealt with by suspension, and in order to obtain the best view of what may be termed the face of the plant (for all plants and shrubs have a best side), so as to depict the charming little cups with their tendrils, they require to be removed from the position they occupy in a stove-house, which is generally at a high elevation over and above the other plants on the stage of the house. The removal of plants of this description to a suitable position for being photographed means the suspending of them by means of long wires or strong cords from a position near the top of the stove-house, and then the difficulty at once begins in being able to get the plants absolutely steady during the time necessary for the exposure of the sensitive plate.

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To many who have never had to deal with subjects of this description, this may appear quite a trivial matter to overcome at any time, especially in a greenhouse, but the fact remains that those subjects often give a lot of trouble to arrange so as to present the best point or face of the plant to the camera, for it must be borne in mind when working in such confined situations as stove-houses there will be found very little latitude for moving the camera to suit the subject, but, on the other hand, it will soon be apparent that the plant must be made to suit the position of the camera. It may be taken for granted, therefore, that one of the first things necessary is the provision of some special means for holding the face of the plant absolutely steady during exposure, for the slightest vibration from any passing vehicle, or even a railway train moving rapidly a hundred yards distant, or a strong gust of wind striking the glass roof of the house, will be found quite enough to cause a movement sufficiently pronounced to be noticeable in the finished picture.

* * *

As a rule, gardeners are very conservative, and careful in all their dealings with rare and valuable specimens, and prefer always to manipulate their plants with their own hands, and in a case of this difficulty presenting itself the first expedient resorted to was the tying of the bottom of the basket, by means of a strong cord, to the iron floor plates of the stove-house; this proved of no use whatever, for not only did the plant present its wrong face to the camera, but the spinning movement was as pronounced as ever for a very long time. The next expedient tried was attaching four black threads to each corner of the basket, and, although this proved somewhat better than the first, it was still of no avail in overcoming movements whenever a cart passed on the roadway in close proximity to the house. After much discussion it was decided to attach a rigid support to one side of the basket, and so fix it that the other end of the bar of wood could be made fast to the wall of the house through the paper background. A firm rod of wood was thus used to place the plant with its proper face to the camera, and this at the same time proved sufficient to overcome any vibration. A rigid support running from the plant to the wall or window of the house was the only means of overcoming the difficulty, and this support was easily so attached to the back of the body of the basket as to be invisible in the finished picture.

* * *

THOSE who have had experience in dealing with another class of subject in floral photography, such as cut flowers, know well how difficult at times it is to arrange the specimens in a

vase so that they yield not only a well-balanced effect but at the same time will permit of the flowers being placed *in situ*, so as to assist the lens in bringing the different planes of the object in fairly good focus all over, for just when it has happened, that after a long and tedious attempt to nicely arrange the cut flowers, and it looks as if success has at last crowned one's effort, a twist in some stalk will give out and a prominent petal will fall out of place and necessitate the whole arrangement being gone over again. A very common method of procedure when photographing subjects of this kind is to place the stems of the flowers in a vase or other receptacle partially filled with water. Now, this is by no means the easiest or most desirable way of undertaking subjects of this kind. In all cases, when possible, the stems of such flowers should be specially prepared for the purpose of being photographed. This may mean wiring them, which is an unfailing preventive of movement, after the stems are once placed in their desired position, but water should never be employed in a vase to hold the stems in position. Let those who have experienced difficulty in this direction just try the effects of substituting sand for water, and they will be surprised at the comfort of the operation, for with such a rigid base as a body of sand, and with the stems of the cut flowers properly wired, they can be made to fall into any position with little trouble.

* * *

THEN as to the other difficulty experienced in bringing the various petals, both at back and front, into a good pleasing focus. Much will depend upon the subject being dealt with, and the size of the object depicted in the negative. It need hardly be said that when working on many subjects of this kind the chief aim is to render the flowers as large as possible. This means the employment of long-focus lenses, well stopped down, and much useful work can be done with single lenses, which are more preferable than many of the double combinations so often used. The best objective, however, of all to use in work of this description is a long-focus portrait combination, for, by unscrewing the back elements of the lens, more or less diffusion of focus, with a delightful softness in effect is introduced, and by stopping the combination down it is surprising what a range of definition can be obtained when an objective of from 21 to 23 in. focus is employed.

* * *

IN floral photography there is no doubt the background that is employed plays a most important part, and novices who for the first time undertake the photographing of such subjects in glass houses or conservatories are not long in finding this out. One of the most common mistakes made in regard to backgrounds is the providing of them too small in size. It is quite surprising the extent of span many subjects will take up. An ordinary paper background of about four feet in breadth by six feet long may permit a large amount of useful work being performed on such small subjects as bouquets or specimens of cut flowers, but for the ordinary run of large pot plants and other subjects in well-appointed conservatories such a small size is quite useless, and any attempt to make it do duty by cramping and other subterfuges will certainly prove most exasperating, and tend to failure. Not only must the size of the background be ample when really serious work of this kind is being done, but some thought must be bestowed upon the colour of the material. As to size, where shrubs and such subjects as palms are con-

cerned, a lantern screen of twelve feet is a most useful adjunct in floral photography. The framework for a sheet of this size is best made of stout bamboo canes not less than one inch in diameter; these canes are very light, and offer no serious trouble in transit. For dark green foliage plants and shrubs an ordinary white linen lantern sheet will work well enough when placed considerably behind the objects, but for flowering plants with a range of white petals a darker tint must be used, and then at times it will be found that a good sample of the homely Scotch blanket, well stretched and out of focus of the lens, will help any one over a stile at a pinch. A good dark grey paper background made by stretching it on cloth and then colour washing the paper surface is also a very useful article to have at command, but where orders have to be executed in outlying situations a blanket and a clean white sheet will do a lot of useful work.

* * *

FROM time to time we hear a great deal about that bugbear halation when dealing with special classes of subjects, but an experienced worker knows how to overcome it; in fact, halation seldom gives those who know how to operate properly any thought whatever. If suitable plates be used, and the exposure be ample, halation will give no trouble in floral photography. Neither will delicate half-tones be clogged up or rendered muddy if proper regard be paid to the lighting of the subject. Properly lighting a subject does not mean flooding it with an overpowering amount of light, neither does it permit of work being done with a poor, weak, dismal light, but rather consists of waiting often many weary hours or days for just that nice amount of diffused daylight that yields brilliant high lights in contrast to half-tone and shadow, all of which may be on one special petal with a close touch of each other. In floral photography it is surprising what a wide and delightful field lies open for those enthusiastic workers who have plenty of time and means at their disposal, and it is gratifying to observe that several of our more important horticultural societies are now beginning to encourage photographic exhibitions in connection with their annual flower shows. This alone will tend to bring this delightful branch of work before the notice of those who have hitherto never given it their attention.

STUDIO BUILDING.—III.

AFTER considering questions more especially forming part of what may be termed the ground plan of the building, there remain to be dealt with the many-sided problems connected with the actual shape of the studio. As this is a subject on which opinions as varied as absolute—we might almost say obstinate—are held, we do not propose to pick out any one form as being best, we intend rather to show the peculiarities attendant upon each shape. There are three well-known types—the ridge roof, the lean-to, and the sloping roof. The ridge roof has two sides sloping to the walls from a side running the length of the studio. The lean-to has a roof of a single slope, the ridge being on a high wall running also lengthwise, and slopes down to the opposite lower wall. The sloping roof has its ridge at the end of the studio, and it slopes down towards the floor in front of the sitter. Then we have as a sub-division common to all three—the tunnel studio.

We will treat of the latter first. As its name implies, this form of studio has its length increased by means of an unlighted extension usually much narrower than the studio proper, and so requiring less ground space. Primarily, we believe it was devised more especially for keeping the camera itself in comparative darkness, and so increasing the brilliancy of the negative. It answers this purpose effectually, but the same end can be attained by covering the camera with a light screen work. Its disadvantages are that when a distance between the camera and lens involving retiring into the tunnel is required, there can be only one light direction, i.e., from the sitter's right or his left. As one side of a face is so often better than the other, it is obviously disadvantageous having to take a face turned to the light whenever the best side of his face is that upon which the shadow falls. Such so-called Rembrandt lighting does not suit every face. It will be noted that these remarks pre-suppose that the skylight is not open on each side, the great objection to such a form being the fact that unless there are outside screens as well as interior blinds, the sun would have too much power, and render it difficult to keep the room cool.

To a certain extent the sloping front shares the same objection, for unless the background end be of very great height this form resolves itself into a tunnel shape, or its analogue. A great difficulty with studios in winter time is the lodgment of snow, and to prevent or lessen this a fairly steep pitch should be chosen. We do not consider an angle of 45° at all excessive for the attainment of this end. This would work out somewhat as follows: Taking 20 feet as a minimum length for the glazed part, and 8 feet a minimum height for the lowest end, we should need a wall 28 feet high for the background end, or, reducing the pitch to the lowest advisable, a wall of 25 feet. This would involve in a detached studio the increased expense of very great thickness, or an equivalent expense in buttresses with a thinner wall. Further, such studios usually being built north and south, the sun would gain entrance for two or three months on each side of midsummer unless an elaborate series of screens were erected outside, while if a diffusing screen were used inside the place would be very hot. When, however, this form is built against an existing building sufficiently lofty, the chief drawback is the number of windows that would be disestablished. Turning now to the lean-to, we find a tall wall again a necessity. A studio 15 feet wide, with an 8 foot lower wall, would, with the pitch above referred to, require the wall which supported the ridge to be 23 feet high—again excessively lofty, and needing substantial thickness, an objection again removed if the studio be built against another existing building, with also the disadvantage attaching to the previously described form. This shape permits of the sitter being placed at either end, a most valuable point, which should always be aimed at if possible.

Finally, we have to consider the ridge roof form. This is the most compact of any; it needs the least height in the walls, and can be built fairly light, yet be as strong as the other shapes that cost far more to build. Once more working on the 45° pitch, and with a 15 feet wide studio, we get with side walls of 9 feet, only $16\frac{1}{2}$ feet as the highest point of the studio; rafters far less heavy and light-obstructing may be used, and as they are much shorter they could easily be made substantial enough to withstand any strain which might crack the putty and render them leaky. There would also be a perceptibly advantageous gain of light through less obstruction from the rafters or bars' lessened width.

Whatever the shape of bars, it is advisable to have them so shaped as in the event of a leak to carry the leakage away, and not permit it to drop into the studio. Some achieve this end by suspending under each rafter a tin or other thin metal trough running the whole length; others adopt the better plan of grooving the rafters so that leakage might run along the groove. This is by far the better plan, and perhaps the best place for the groove is on the top of the rafter just beyond the recess for receiving the putty.

Finally, we must look into the question of glass. Plate glass is sometimes used, but the thinnest kind is very costly, and is also heavier than ordinary window glass. Furthermore, some plate glasses become quickly coloured when exposed to light, and so exposures would be increased. Rolled or fluted glass absorbs a noteworthy proportion of the light, and "ground" or "obscured" glass should not be used on account of the difficulty in keeping it clean. When window glass is used good English sheets should be chosen. They are far less brittle, and the thickness should not be under that known as 32 oz. glass. Any thinner glass than this would be likely to suffer when a shower of hail fell upon it. One word of conclusion. The best preventive of ulterior leakage is to be found in running a thin line of paint round them where the putty is placed when bedding the glass in the required grooves or furrows of the rafters. We now conclude our disquisition upon this important branch of practical photography, feeling assured we have placed before our readers such a description, brief though it be, as may enable them to plan, when necessary, a studio that shall be useful, convenient, and capable of giving any required style of illumination for almost any kind of work.



Oil Lamps for the Lantern.—The lantern season is now about commencing, and many will be unearthing those which have lain by during the summer, and some will find the oil lamps in them in anything but a pleasant working condition, particularly if they were stowed away dirty, or with the wicks and oil still in them. If they are used as they are, with only a perfunctory cleaning, they will most likely smoke and emit anything but pleasant odours. In such cases the lamps should be thoroughly cleaned before they are again taken into use. The oil should be emptied out and the old wicks discarded. The lamp, and all its parts, should be thoroughly cleaned by washing with new paraffin oil and dried, after carefully wiping with clean rag, on a warm stove. New wicks should then be put in, but before they are used they are well dried before the fire, so as to eliminate all traces of moisture, which they sometimes retain with great tenacity. If the wicks are damp when they are put into paraffin lamps, they never burn so well and often emit smoke or inodorous fumes. This is a fact too often overlooked in trimming oil lamps. Complaints are often made that all oil lamps "stink" when used in the lantern. But in nine cases out of ten it is due to the lamps not being clean or the wicks being out of order, things easily remedied. In many cases the smell arises, not from the wicks, but from the evaporation of oil outside the reservoir as it becomes heated. If a well-constructed oil lamp for the lantern is kept perfectly clean, outside and in, and the wicks carefully attended to, there will be no smell from it while burning.

Photosculpture.—From a very early period in the history of photography, attempts have been made to apply photography to sculpture, and with more or less success, but, up to the present, with very little commercial success. The first method we call to mind is that of one François Willème, which he patented in the early sixties, and was taken up in this country by the late M. Claudet, but it did not become popular. Since that time numerous other methods have

been devised, but up to now nothing practical has come of them. The examples by Herr Selke's process, now to be seen in the Royal Photographic Society's Exhibition, are attracting some attention, and many are speculating as to how they are produced. Some little time ago we published the specification of Herr Selke's patent (see the last volume), but from that, we must confess, we do not quite grasp how the process is to be worked in practice—the specification seems a little too vague. The examples shown are bas-reliefs and alto-reliefs, and are really very good, but how much of their excellence is due to the process, and how much to hand work on the matrices, it is difficult to say by merely looking at the finished results. Most of the methods of producing bas-reliefs, previously published, have been based upon swelled gelatine methods, emphasising the relief by scraping away certain parts in a cast in plaster, or wax, of a cast taken from the gelatine relief, and doing the same with a cast taken from that. Then from the second cast or mould the final result is obtained, either in plaster or by electrotyping. But Herr Selke's process seems, from the patent specification, to be different from those, and a fuller description of the method will be interesting.

Carbon Lantern Slides.—As the lantern season approaches, so will the different methods of making the slides receive attention at the various Society meetings. We see from the report that the carbon process of lantern-slide making was demonstrated before a recent meeting of the Croydon Camera Club. It is somewhat surprising that this process has hitherto been so much neglected by amateurs for lantern transparencies. It is easy to work, a greater variety of colours can be obtained with it than by any other process, and any number of slides can be obtained of identically the same colour, and that is not easy of attainment by any other process that depends upon development and after-toning. The carbon process is also of less trouble than any other that requires the pictures to be toned. The chief and only objection that can be urged against this process is that the tissue is not sensitive enough for it to be used for producing slides from larger negatives in the camera, so that it is necessary to first reproduce the negative to the size of the slide. One of the essentials in the tissue, when it is used for lantern slides, is that it be free from tint, *i.e.*, superficial insolubility, otherwise the highest lights will be veiled and thus mar the brilliancy of the picture on the screen. The kind of tissue generally employed for lantern slides is the special transparency, because it is highly pigmented and the pigment is in an extra fine state of division. It is quite possible that, if there were a demand for it, the manufacturers would put upon the market other coloured tissues having the same characteristics.

Business Enterprise in Photography.—The paper read by Mr. J. A. Tennant at the New England Convention, which we published *in extenso* last week, should be read by all photographers about to commence business, and also by many of the older school here, who are now complaining that business is not nearly so good, or so profitable, as it used to be with them in years gone by. What Mr. Tennant said with regard to American businesses applies equally to English ones. At one time, while there was a fair demand for photographs, there were but comparatively few photographers to supply them, and those who did, and could do good work, had only to show specimens and they would quickly build up a good business. The case is very different now. Although the demand for portraits is probably greater now than it ever was, there are very far more photographers to supply them, and, as a consequence, competition is infinitely greater and this competition, unfortunately, has, in too many instances, taken the form of cutting prices, with small profits, accompanied by small returns. Those photographers who, while maintaining their prices, still go on in their old-fashioned reel of twenty years ago, are probably feeling competition most, though their work may be still equal to any. It is those who have greater business enterprise—though not doing better work, perhaps not so good—who are *their* greatest competitors. It is not from the low-priced competition that they suffer most. Although Mr. Tennant's paper was largely devoted to those who are contemplating starting in

business, his remark applies equally well to those who are old-established, if they desire to maintain their businesses against enterprising new comers who do the best class of work.

What is a Silver Picture?—This question has more than once occurred to us, as it, no doubt, has to others. In the catalogue of the Royal Photographic Society's Exhibition we find pictures described as "bromide," "gelatino-chloride," and "silver." In advertisements of printers seeking engagements we often notice that they are well qualified in "P.O.P.," "C.C.," and "silver" printing. Now, are not these processes, one and all, silver processes? Would not the term silver apply to every one of them, for they are nothing else? Sometimes collodio-chloride prints are simply called "chlorides." But are not gelatino-chloride and albumenised paper prints as much "chloride" as the collodio-chloride ones? The term "silver" is generally now considered to mean albumenised paper pictures; then, why, when the picture is on paper, should it not be described as albumen—it would not be confounded with the albumen process on glass, and it would be more descriptive. Those unacquainted with photography, visiting the Exhibition, might well assume that the pictures described as bromides and gelatino-chlorides were not silver pictures. With many it is a very general idea that silver prints must necessarily fade and they may be led to assume that pictures, other than those described as "silver," will prove permanent, while they may really prove more evanescent than those by the old albumenised process. In this way the present nomenclature is apt to be misleading, and so it may be to future generations if silver processes should ever become superseded in general practice. We know how frequently the old *sel-d'or* and the old combined toning and fixing baths are often confounded by some modern writers as being one and the same thing, while they are totally different.

ON THINGS IN GENERAL.

THE event of the year in things photographic has been the fitting of the Royal Photographic Society's Show to its new quarters in the New Gallery. The opening night was a conspicuous success, socially and pictorially. I am not in the Secretary's confidence, but I do not hesitate to say that the numbers present were far in excess of any that I have ever attended. No little of this may be accounted for by the great popularity of the present President, if I may say so without casting a slur on previous occupants of the Presidential chair. Mr. Dallmeyer, in the natural course of events, is a living and known personality to very many members who never attend meetings; previous Presidents, famous and known by their achievements as they are, have been to the many pure abstractions—beautiful abstractions, it may be, from a literary point of view—not concrete entities to everybody, like the genial host of Saturday a few weeks ago. I heard that we were indebted to him for a very pleasing variation—the addition of music to the other attractions of the *soirée*; a happy thought well carried out.

Of the Exhibition itself, words of praise are deserved. The commercial side of photography was well represented, though in one conspicuous case a little weeding out would have made a better show; quantity is not a useful factor in matters artistic. The side shows (free!), as the apparatus stalls might be not inaptly termed, should prove a financial success, seeing that the charge to the exhibitors was so low. I expect that another year there will, at present prices, be a rush for places among manufacturers generally. The Exhibition proper was distinctly good. (By the bye, why were the staring white number-tickets again used? the Society had distinctly scored on previous occasions by toning them down.) The deadly funereal effect of past exhibitions is not conspicuous in the present gallery, which does not leave such depressing memories as of late years have been forced upon us. Another year, no doubt, there will be a still greater improvement, and pictures with white mounts once more exhibited. For some time past it has been evident that the Hanging Committee literally dare not put up a photograph with light surroundings. I know of pictures rejected which could not possibly have been refused on any other ground. It is useless saying "They're not like dumb-driven

cattle," for the hangers and the hung are alike; they have been driven by the current of popular caprice into countenancing a style of framing which must have driven lumber to a premium. Now that in "another place" a ray of light has illumined the hangers in this direction we may be sure that the R.P.S. will let their own taste have some influence. For the style of the last few years has been as inartistic, as ugly, as deficient in taste as originality—an intolerable amount of timber to one halfpenny-worth of photograph, if I may be allowed to play with well-known words.

I freely admit that the Photographic Salon set this fashion, and may claim originality in the matter, whatever it is worth. I had an amusing experience there. An enthusiastic Salonite was expatiating upon the beauties of the contents of the frames. "There's feeling," he said. "That precisely expresses it," said the other, "I myself have a strong feeling of sickness since I came on here." And to the old photographer such a feeling must present itself as he contemplates the inane monstrosities that have been substituted for photographs in such wide profusion. A little opposition is always a benefit to any society or any business; but here the opposition has lost its head and indulged in such grotesque vagaries as to entirely swamp the small residuum of really good work there shown. A well-known reviewer has made an onslaught on the ponderous framing of the Salon, one photograph had, he said, enough timber round it to form a fence to go round the original of the picture. There is some really good work there, not much it is true, and well worth inspection, and not to be pooh-poohed simply because much of it is done by men who exhibit, and exhibit better work, at the New Gallery. I note that the silly preface that has so often afforded merriment has been wisely abandoned, and instead there is an invitation to a cup of tea. Truly, their tea has a better taste than their preface ("Foreword" I believe they used to call it).

When I took up my last *Journal of the Royal Photographic Society*, I began after a while to think that by mistake I must have opened a page of *Alice in Wonderland*, for the most delightful topsy-turvydom prevailed that ever characterised a meeting of that august Society, when a paper on "Stops-lenses and Perspective" was read. I don't know what the Kodak Company will say to the writer's dictum that the best lens makers all use another system than the R.P.S. It will, I think be granted that there are more Kodaks sold than any other camera, and their lens stops are all indicated by what is best known as the U.S. system (by the bye, it is known by few that the use of the letters U.S. as describing the R.P.S. system was invented by THE BRITISH JOURNAL OF PHOTOGRAPHY). Next we find twenty inches given as the usual distance for reading and viewing pictures. Well, all I can say is that when a man begins to trombone his paper (which is certainly the case at twenty inches) he ought to use spectacles. But the gems of the suggestions are that hanging committees should examine the photographs to see if they are taken with a rising front and hang them in accordance. After this one is not surprised to find it recommended to take a church tower in horizontal sections and piece them together, like they make wedding cakes in fact. Infected, no doubt, by the *Alice in Wonderland* atmosphere, most of the speakers seemed to lose their usual aplomb and give us "facts" of most doubtful character. Mr. Bolas can give points to most of us yet we find him quoting books as giving about 60° as the angle included by vision. My recollection is that they give a far larger angle. His proof of the amount seen really is ingenious and correct. Further confusion of ideas was introduced by another clever worker, the Rev. F. C. Lambert, who explained Mr. Bolas's next experiment by saying that the lights falling on the periphery of the retina merely showed that there were nerves in that position and not that the lights were distinctly seen. Well, it is a fact that when an astronomer cannot see a faint star when looking straight at it he brings its image towards the periphery of the retina, and then he can see it; surely that is "seeing in the ordinary sense of the word." Lastly, no one could help being struck by the topsy-turvy state of the discussion when Mr. T. Thorne Baker described a photograph of the original, of which the only way in which one could gain any idea was by lying on the ground face up, and holding the photograph above one's head. Possibly at the next R.P.S. Exhibition couches will be provided for readily inspecting photographs of this nature. I would

commend to every anti wide-angle enthusiast the sober, weighty words of the President, "There was therefore, theoretically, no objection whatever to an extremely wide angle provided the perspective was viewed from the true station point." This might form a permanent text whenever the subject is again discussed. It has been said many times before, but the argument leading up to it was cogent and irrefragable.

Mr. Reed, in his article on "Copyright Portraits," touches a sore spot with many photographers; but he may take it the days of 80,000 orders for Royal, or any other photographs, are gone for ever. The illustrated papers have done that for us. Every one now looks for any specially taken photograph to be visible in "any weekly illustrated paper." A lot of money has been made, and will be made, by copyright fees from the illustrateds. He is, however, a lucky man who often gets more than a five-pound note for such (and they are trying to establish a maximum of five shillings!), but what have they lost by it for themselves and their brother photographers?—hundreds of thousands of pounds of replicas. And who have gained, except the producers of those wretched, feeble caricatures of photography which are published to the utter degradation of illustrated journalism from the proud and high position it once occupied of artistic eminence and exploiters of the very best examples of the now almost extinct British art—wood-engraving. Finally, Mr. Reed has hold of the wrong end of the stick. It is not the photographers who make the arrangements for publishing their Royal photographs in one journal; it is the proprietors of the journal who make the arrangements, and the photographers merely act as their hired agents; they receive, therefore, a weekly retaining fee! So much for what journalism does to benefit photographers in general.

A great deal of interest has been taken in the alleged photographs taken through a human body by nothing but sunlight; are they fakes or not? One well-known photographer was arguing that there was nothing wonderful in it, as the sun was bound to act through the body if the plate was put there long enough. "Look," he said, "how easily we can see a light through the fingers." This seems a fair argument till it is put into figures. Let us suppose that, in the first case, the sun on an open negative, with a plate behind, could impress an image in a millionth of a second; further, that a section of the body, say an eighth of an inch thick, permitted as much as one-tenth of the received light to pass through. (Both these assumptions are extreme; the power of the sun and the transparency of the body would be much less.) Then the light passing through, say, eight inches of human body would take many million of million years to produce a print! The actual fraction representing the amount would be one with one million for a numerator, and a denominator of one followed by a cipher for each eighth of an inch, say sixty-four ciphers—an amount of light whose minuteness would be beyond the power of the human mind to conceive.

FREE LANCE.

DIRECT CARBON PRINTING WITHOUT TRANSFER.

[In sending us the appended note on a non-transfer method of carbon printing with celluloid as a support, Dr. D'Arcy Power remarks: "Accompanying herewith I enclose you a brief description of a method of carbon printing that, so far as I can ascertain, is new, and is certainly not in use. Knowing that carbon printing is more largely practised in Europe than on this continent, I send these notes to THE BRITISH JOURNAL OF PHOTOGRAPHY as the best means of reaching the largest number of workers."]

To obtain an unreversed carbon print without transfer of any kind, and to do this without any greater trouble than is involved in the production of a silver print, is what I purpose to describe.

More than a year ago I experimented on the printing of carbon tissue through a film of transparent celluloid, and found that no perceptible difference of definition resulted from its interposition; on the contrary, that the image was rather benefited than otherwise by its use. In these experiments the carbon tissue was squeegeed direct from the sensitising bath on to the celluloid, the outer surface washed clean, and, when dry, the tissue printed through the celluloid, and, after development in the usual way, the celluloid was backed up by

squeegeeing it in optical contact with paper, or by coating it with a layer of paint. In this way I obtained very beautiful prints, having a highly polished surface, that elicited much praise from those who love that kind of thing, but which on that account did not please me. Some time elapsed before it occurred to me that celluloid with a ground-glass surface could be printed through, but one day I tried the experiment, and I was not a little astonished to find that the image developed nearly as sharp as with unground celluloid. This solved the whole difficulty of direct printing. I coated a sheet of ground-glass celluloid with the usual gelatine and pigment coating mixture. To sensitise it it was only necessary to immerse it in the bichromate solution and hang it up to dry. Printing was done as with silver paper, no safe-edge being required. Development can be proceeded with immediately, the safe-edge being unnecessary, and the moistening and pressure not needed. Direct from the printing frame it passes into the hot water, is washed up, dried, and backed. The backing may consist of paper of any desired tint or grain, squeegeed into optical contact with the print by means of a solution of gelatine, or it may be paint ground in varnish, such as may be bought anywhere. By judicious backing, prints of exceeding beauty may be obtained. The ground celluloid at present on the market gives a surface slightly more matt than is desirable for small subjects with fine details. This however, may be easily reduced to any extent desired by rubbing the matt surface with a mixture of one part of ether in eight parts of alcohol. I expect to soon obtain from the makers a celluloid with a more finely grained surface; and, when this is on the market, and the Elliott or Autotype Company coat the same with pigmented gelatine, carbon printing will be the simplest process in existence. Let me here sum up the advantages of my method of working:—

- First. Tissue, after sensitising, dries flat and smooth.
- Second. Requires no safe-edge.
- Third. No transfer and subsequent waiting prior to development.
- Fourth. No second transfer to obtain correct position.
- Fifth. A surface that can be readily spotted, retouched, offensive high lights toned down, or painted out, or the whole picture tinted as a crystoleum.
- Sixth. After the picture is produced, the power of choosing the tint and apparent texture of the surface it shall seem to possess.
- Seventh. A surface that is indestructible and may be washed, thus allowing of framing without glass, whereby the purity of tint of the print is spared the modifying effect of colour in the glass.

Against these many advantages the only added inconvenience is the trouble of coating the celluloid.

Until celluloid coated with pigment can be bought, the worker desirous of using this process may choose one of three courses.

First. He may coat the celluloid himself, which is a little troublesome, as it is more difficult to handle than paper.

Second. He may sensitise ordinary carbon tissue and squeegee it to the smooth side of the frosted celluloid. If he follow this method, he will need to take care that no air bubbles, even the smallest, interpose between the tissue and the celluloid, and he will also need to be careful that as the tissue dries it does not separate from the celluloid surface before printing, or loss of definition over the detached portion will result.

Third. Tissue may be sensitised and printed in the ordinary way, transferred to celluloid, and then backed up. This last method while the same in all respects as single transfer, gives the correct position without a double transfer. It permits of choice of backing, and has the advantage of absolute sharpness of definition. Until coated celluloid is placed upon the market it will hold the first place with the general worker, and is the method I at present employ.

I have not found that any coating of the celluloid with chromatised gelatine is necessary, but some care is required in squeegeeing to the final support, that no air bubbles intervene. They will cause stars on the print. Spotting and retouching is best done with oil colours, and the power of modification is almost unlimited.

Such in brief is the process I would urge all carbon workers to at least try. The facility of working, and the beauty and permanency of the prints will undoubtedly assure it a prominent place among photographic printing methods.

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THE EVOLUTION OF MODERN LENSES.

[Abstract of the President's Address to the Members of the Royal Photographic Society, October 9, 1900.]

THE first doublet specially intended for photography does not appear to have been made by Chevalier until 1840. These doublets were reported upon in detail by the "Societe d'Encouragement," who awarded him a platinum medal, on the ground of less spherical aberration and adjustable focal length. The latter was brought about by an adjustment in the separation of the component lenses. It is interesting to note that a document exists purporting to be signed by Charles Chevalier, was witnessed by Jombard, describing these adjustable doublets, and, although no formulæ or particulars are given, the employment of the iris diaphragm is mentioned for the first time.

This year (1840) was signalised by the advent of the Petzval portrait lens. At this juncture, a most important one in the history of photography, and particularly in lens construction, it is necessary to examine how far the theory of the subject had progressed. So far as I am aware, the only contribution which contained any reference to lenses constructed for the camera obscura occurs in an early classic contribution by the late Astronomer-Royal, Sir George Airy. "On the spherical aberration of eye-pieces of telescopes," contributed to the Cambridge Philosophical Society in May, 1827. The author here treats of three spherical aberrations; distortion, curvature of field, and astigmatism. It is evident from his writing that he considers that lenses hitherto constructed owed their form to "General Rules of Workmen," and at the conclusion of his thesis, he gives a number of practical rules, which conform to his theoretical investigations. There is a short passage referring to the best forms of single lenses, and the situation of the diaphragm "most favourable to the formation of a distinct image" in the camera obscura; they are a plano-convex with the diaphragm placed in front of either two positions, or a meniscus lens, the diaphragm in this case being placed behind the lens in either of two positions. He shows that if a concave spherical surface is used to receive the image, it will be accurately formed upon it. Sir George Airy points out that Dr. Wollaston's perisopic camera conforms to the theoretical conditions.

With the exception of this notable contribution, which threw important light upon optical theory generally, there was no other advance until the epoch-making investigations of the late Professor Petzval. In 1843, Professor Joseph Petzval, in an address to the Arch-duke Ludwig of Austria, described how he had raised the subject of the correction of photographic lenses from the plane of experiment to a definite scientific and mathematical inquiry. He recited how the errors in the formation of images by lenses, due to the employment of spherical surfaces, might theoretically be eliminated. The outcome of this research was to place a portrait lens of high intensity and good covering power in the hands of photographers and photographic investigators; in so doing he earned for himself undying fame in the science, and conferred upon his generation one of the most important means of raising the status of photography. Petzval's theoretical investigations formed the basis of some subsequent elaboration by Seidel, and up to the present date, the Petzval-Seidel theory of the construction of lenses holds its own.

Petzval's first theoretical results were brought out in 1840 by the house of Voigtlander. Petzval had not only calculated the portrait lens, but also a non-distorting landscape lens; the latter, however, did not make its appearance until 1858, and will be referred to later. Soon after the appearance of the first portrait lenses and the publication of Petzval's theory, manufacturing opticians in every country adopted this form of portrait lens, which held its sway until midway in the sixties.

In order to trace the evolution of modern lenses from this period onwards it will tend to least confusion if they are placed under the following headings:—

1. Landscape lenses.
2. Portrait lenses.
3. Triple lenses.
4. Doublets.
5. Telephotographic lenses.

1.—LANDSCAPE LENSES.

The first, as we have seen, was Wollaston's perisopic lens, an account of which he contributed to the "Cambridge Philosophical Transactions" in 1812. The next was the early form of single cemented lens composed of two glasses already described as having been constructed by Chevalier for Daguerre. In 1859 Voigtlander issued the landscape lens calculated by Petzval in 1840. It was known as the "Orthoscopic lens," and was hailed with delight as the first non-distorting landscape lens introduced. Unfortunately the claims for its entire freedom from distortion, and spherical aberration, were not borne out, for it was found that it pro-

duced "pin-cushion" distortion, in contra-distinction to the "barrel-shape" inherent in the landscape lenses hitherto employed with the diaphragm situated in front of the lens.

In 1857 the late Thomas Grubb patented a view lens consisting of a meniscus crown lens cemented to a meniscus flint lens, with the diaphragm placed in front of the former. In this lens the correction for spherical aberration was more perfect than in those hitherto constructed, though it was not strictly aplanatic. Grubb claimed that: "It forms more distinct images of objects than either the ordinary view lens, or the front compound lens of a portrait combination, as occasionally used by photographers as a view lens. I do not, however, limit myself in the use of my improved lens to that of taking views, or of being used alone. The lens admits of entering with advantage into combination with one or more other lenses of either similar construction to itself, or of other or ordinary constructions." Thomas Grubb, so far as I can trace, did not employ himself to similar combinations to form a doublet, but his statement in his patent that there was this possibility, subsequently give rise to the suggestion that Steinheil's aplanat and my late father's rapid rectilinear were due to Grubb's single landscape lens, although it seems to be more reasonable to look upon these as an evolution of the symmetrical non-distorting perisopic lens of Steinheil.

In 1859 Goddard constructed a landscape lens which he termed a "Double perisopic." It was composed of a double convex crown cemented to a double concave flint placed in close proximity to a meniscus crown, the concavities facing one another, and the components being mounted in a single cell with the diaphragm placed in front of the cemented combination. This lens is of particular interest as being the first published attempt to eliminate the "barrel-shaped" distortion due to the position of the diaphragm with respect to the lens, when composed of a single cemented combination. The late Mr. Traill Taylor states that he was in possession of the only lens of this form made by Goddard. About the same time Goddard introduced a lens which he termed a "combination landscape lens," which I have included under this heading, although it might possibly also be included under doublets. The lens itself consisted of two combinations, the anterior being a double convex crown cemented to a double concave flint, the posterior combination being composed of a double concave flint mounted in juxtaposition to a meniscus crown. The back combination was practically of infinite focal length, and Goddard suggested the substitution of various anterior achromatic combinations, of different focal length, to be used in conjunction with the posterior combination, so as to obtain various focal lengths. Goddard also claimed freedom from distortion and flatness of field. The late Mr. Traill Taylor stated that he had access to Goddard's work-book after his decease, but I have failed to trace any particulars as to the intensity at which this lens worked. It seems in the main to have been an attempt to perfect Petzval's orthoscopic lens.

The next important advance was due to my late father, J. H. Dallmeyer, who in 1865 patented his wide-angle landscape lens. This lens was the first triple cemented lens, and consisted of a meniscus flint sandwiched between two meniscus crown lenses. It worked at an intensity of $f\cdot15$ and covered with fine definition a greater angle than any single lens hitherto introduced.

In 1884 I modified this form of lens and by employing an extra light flint glass, in place of the anterior crown employed by my father, attained the highest intensity of $f\cdot11$. This lens, however, was not designed to cover so great an angle, but on the other hand to include a narrow angle destined to give more pleasing perspective.

In 1887 I constructed a rectilinear landscape lens which history shows was designed upon similar lines to Goddard's double perisopic. The lens itself differed in that the anterior cemented portion was a double meniscus in contra-distinction to Goddard's double convex crown cemented to a double concave flint.

It is necessary at this point to make a brief reference to a subject, the great importance of which is, in itself, sufficient to have occupied more time than is at my disposal in this address. I refer to the possibilities opened up to opticians for improvements in lenses, particularly in the cure of astigmatism, by the introduction of the new Jena glasses. In the early eighties experimental research was undertaken by Professor Abbe, an Honorary Fellow of our Society, in conjunction with Messrs. Schott and Gen., to produce new types of optical glass. Until their labours were completed and the results obtainable in commerce (in 1888), the only glasses which had hitherto been available for the use of the opticians, were characterised in general by an uniform inter-relation of refractive index with dispersive power: the higher the refraction, the greater being the dispersive power. An examination of the new glasses shows that this old order of things was departed from in several instances, and we were given crown glasses which possess a higher re-

refractive index but a less dispersive power than the flint glass formerly, and still, employed.

To proceed with the evolution of the single lens: in 1893, Dr. Rudolph, of the firm of Messrs. Zeiss, constructed the first single anastigmat composed of three lenses cemented together. It was aplanatic and worked at an intensity of $f\cdot14$; later in 1895, he worked out a quadruple anastigmat which was also free from spherical aberration, and works at an intensity of $f\cdot12.5$. This lens is the most perfectly corrected single lens that has yet been evolved, for in the latter, Dr. Rudolph has succeeded, not only in obtaining freedom from spherical aberration and astigmatism, but also made a very successful attempt at the elimination of coma.

II.—PORTRAIT LENSES.

The first, as already intimated, was due to Professor Petzval and constructed by Voigtlander in 1840.

In 1841, probably before Petzval's work was known to opticians in this country, my late grandfather, Andrew Ross, constructed a portrait lens for Henry Collen, in which both lenses externally were plano-convex, the front being composed of a double convex lens in contact with a plano-concave flint; the posterior combination consisting of a plano-convex crown in contact with a meniscus flint. The lens was not aplanatic and gave a very curved field, so much so, that it was necessary to have the sensitiveness surface upon which the image was received, bent into a spherical form. Andrew Ross shortly after this constructed the earliest of the Petzval lenses which were made in this country in accordance with his theory.

The earlier lenses of this form were not "actinic," that is to say, the chemical and visual foci were not coincident. It is therefore interesting to note that in 1854, Lerebours constructed a lens in which he claims to have accomplished the coincidence of chemical and visual rays.

Until the year 1866 every manufacturer of portrait lenses constructed them upon Petzval's formulæ in varying degrees of intensity. In this year my late father patented a new form of portrait lens in which the front combination was similar in form to that of Petzval, but the instrument as a whole differed from it in some essential features. In Petzval's lens the rays emergent from the front combination were received upon the convex surface of a meniscus flint, which formed the anterior element of the back combination, and emerged parallel upon the "crossed" form of crown lens, which practically determined the focal length of the entire Petzval construction. In my father's lens the anterior element of the back combination was a meniscus crown. The rays emergent from this converged to a focus in close proximity to the lens itself, but are intercepted by the back element, which consists of a meniscus flint, the focus being formed at the focal plane of the entire combination, as free from spherical aberration as occurs in Petzval's lens. The disposition of the posterior combination of this lens not only enabled a flatter field to be attained, but eliminated the tendency to "ghost" and "flare-spot" which existed in Petzval's form. As soon as this patent lapsed, the Dallmeyer model was generally adopted by manufacturing opticians, and for ordinary studio work is as much in use to-day as it was at the time of its introduction.

In the year 1874 Steinheil introduced a rapid form of his aplanat, which will be referred to later, but as it possessed the high intensity of $f\cdot4$, I have included it among portrait lenses. Each combination consisted of crown and flint meniscus lenses cemented together so that there were only four reflecting surfaces, a condition which theoretically warrants the claim for increased brilliancy in the image.

The advent of Steinheil's group, "anti-planat," marked an important departure in lens construction, for although the Jena glasses which have been referred to above were not available, Steinheil was first to incorporate in this lens the principle of eliminating astigmatism by combining a "crown shape" lens of high refractive index with a "flint-shaped" of lower refractive index. This he did by constructing the anterior combination of a "crown-shaped" flint cemented to a "flint-shaped" crown, the combination possessing positive focal length, but being very much "under-corrected"; the correction of the whole instrument being brought about by a very much "over-corrected" posterior combination.

In 1895 and 1896 my friend and colleague Mr. H. L. Aldis introduced the "stigmatic" portrait lens which in general terms may be described as my late father's patent portrait lens rendered free from the defect of astigmatism. This lens is constructed of three intensities, $f\cdot4$, $f\cdot6$, and $f\cdot7.5$.

In 1898 Dr. Rudolph issued a lens known as the "planar," which also works at an intensity of $f\cdot4$. It is symmetrical and novel in design, each combination consisting of a single meniscus lens, mounted in close proximity to a meniscus combination composed of a double convex lens

cemented to a double concave. It is thus seen that at the present day we are in possession of two types of lens which maintain the intensity of Petzval's construction, but are free from its defects.

III.—TRIPLE LENSES.

The first triple lens of which I can find any account is referred to by the late Mr. Traill Taylor as having been constructed by Goddard in 1859. "The front was an ordinary shallow achromatic meniscus, the centre being a bi-concave, and the back a deep meniscus. The centre lens was smaller than the others, but neither it nor the back lens was achromatised. The first achromatic, and the back meniscus, were of similar foci, the power of the intermediate being such as to neutralise the magnifying power of either of them." ("The Optics of Photography," J. Traill Taylor.)

In 1860 Thomas Sutton introduced a lens composed of two achromatised plano-convex lenses of similar foci mounted at either end of a tube with a simple bi-concave lens, similar in power to Goddard's, placed between them; Sutton termed this lens the "symmetrical triplet."

In 1861 my late father introduced his "Triple Achromatic Lens," in which each element was achromatised. This lens was employed for many years on account of its considerable intensity ($f\cdot10$) and its freedom from distortion, an essential feature for architectural photography. Thomas Ross subsequently introduced a triple lens of very similar type; he constructed the anterior and posterior combinations of the plano-convex form, whereas those of the "triple achromatic" were of shallow meniscus form.

In 1890 Professor Abbe and Dr. Rudolph introduced a symmetrical triple lens in which the exterior elements were uncorrected meniscus lenses, the middle being composed of a double convex lens cemented between two plano-convex lenses. According to Mr. Traill Taylor, Dr. Schroeder ante-dated this lens in an objective specially adapted for celestial photography.

In 1893 Mr. Dennis Taylor introduced the most important triple lens which has been constructed up to the present time. Mr. Dennis Taylor attacked the problem in a distinctly original manner by constructing each of the component elements of forms free from diaphragm corrections, and placed the onus of complete correction for the entire instrument upon the middle negative lens, which is equal in power to the combined exterior elements. Mr. Dennis Taylor has succeeded in so far simplifying the construction, that in its present form each of the three component elements is a single glass lens. It is known commercially as the "Cooke Lens."

It is constructed in two intensities— $f\cdot6.5$ and $f\cdot8$.

IV.—DOUBLETS.

The first symmetrical doublet was ascribed by Mr. Traill Taylor to Davidson, an Edinburgh optician, who in 1841 constructed a double combination in which each element was composed of a plano-convex crown cemented to a plano-concave flint, with the diaphragm placed between the combinations. But for the lack of rapidity, Davidson's lens would probably have had a longer life.

In 1863 Harrison introduced his Globe lens, and in 1864 Thomas Ross an unsymmetrical doublet, but neither of these lenses were of high intensity.

In 1865 Steinheil introduced the simplest non-distorting lens which had appeared up to that date. It consisted of two single uncorrected meniscus lenses with a diaphragm placed between them. As this lens, and one introduced by Zentmeyer of a very similar nature, were not actinic, the chemical focus had to be arrived at either by trial-and-error, or calculation. The intensity of these lenses was low, but their simplicity and large covering power caused considerable interest to be manifested in them.

In 1866 Steinheil and my late father were both at work upon achromatising the symmetrical meniscus form of lens, and at increasing its rapidity. The outcome of this work was the appearance of Steinheil's aplanat in 1866 and my father's wide-angle rectilinear in the same year. In the following year he introduced the first "Rapid Rectilinear." In point of publication Steinheil appears to have ante-dated him with the aplanat. In both these lenses, each combination consisted of the Grubb-form of landscape lens, but whereas no lens, so far as I can gather, had hitherto been constructed of this form, which was truly aplanatic, these lenses were welcomed as a great advance in non-distorting aplanatic lenses of considerable angular aperture ($f\cdot8$). They practically replaced the triple lenses which had hitherto been in use.

In 1872 Morrison conceived the idea that some advantage would accrue by slightly over-correcting one of the lenses of Harrison's "Globe" and supplying the place of the other with a single crown glass meniscus. It is stated that in the Morrison lens a rather larger angle was included than had been hitherto attained.

In 1887 Dr. Schroder, of the firm of Ross and Co., introduced a very interesting lens known as the "Concentric." In this lens the new high refracting and low dispersing crown glass from Jena was employed, for the first time, in lens construction. Each combination consisted of a plano-convex crown glass of high refraction cemented at the plane surface to a plano-concave lens of lower refractive power than the crown, but of practically the same dispersive power. By this means Schroeder was enabled to strike the internal and external curves of the combination from one centre and still produce a real focus. This lens, although it worked at a low intensity ($f\cdot22$), was the first lens which gave a field absolutely free from astigmatism upon a plane surface.

In 1890 Dr. Miethe is credited with having constructed an anastigmat, but I have been unable to ascertain from him its exact construction, as I have only just come across a record of it.

In this year also Zeiss constructed two or three forms of wide-angle double anastigmat, each component being a double combination. These lenses had an angular aperture of $f\cdot17$ to $f\cdot18$.

In 1891 Rudolph issued his anastigmat-doublet, working at an intensity of $f\cdot7\cdot5$. In this lens one combination was composed of glasses of abnormal character and the other of normal glasses; by this method Rudolph claims to have arrived at a perfect correction of astigmatism.

In 1893 Rudolph constructed his anastigmat doublet of a different form, the anterior lens being a double combination, and the posterior a triple cemented combination, the doublet working at an intensity of $f\cdot7\cdot8$.

In the same year he constructed the single triple anastigmat already referred to under landscape lenses.

Dr. E. von Hoegh, of the firm of Goerz, about the same time introduced his double anastigmat, which consists of two triple cemented combinations similar to the single triple anastigmat of Zeiss.

It is not my province to criticise controversial matter, but a discussion which has recently taken place in the "Archiv fur Wissenschaftliche Photographie" between Dr. von Rohr, of the firm of Zeiss, and Dr. von Hcegh, is, bereft of certain personal matter, very interesting as showing the claims of Dr. Rudolph and Dr. von Hoegh in respect of the originality of the Goerz double anastigmat. That both these gentlemen have contributed largely towards the perfection of symmetrical anastigmatic lenses is beyond dispute.

In 1894 Dr. Kaempfer, of the firm of Voigtlander, introduced another symmetrical anastigmat known as the "Collinear." Dr. Kaempfer had been working on symmetrical anastigmat constructions as early as March, 1892, but I understand that the exigencies of the Patent Office, which were forced upon him by his competitors, compelled him to restrain his claim to the form known as "Collinear." Steinheil was apparently at work on a very similar lens about the same time which is known as the "ortho-stigmat."

In 1895, after the completion of his quadruple anastigmat Dr. Rudolph issued combinations of these single lenses to form doublets which he terms the "Satz-anastigmat." This lens has an advantage over other lenses which are free from anastigmatism, in that the separate elements are individually more perfect when used as single lenses.

In this type of lens again we have been able to trace how the glasses introduced at Jena have enabled modern opticians to increase the angular aperture of their lenses, to produce perfect flatness of field, and freedom from astigmatism.

V.—TELEPHOTOGRAPHIC LENSES.

This subject will require but a brief treatment. In 1891 Dr. Miethe and I were working independently to produce an instrument of practical value to photographers, which should enable them to obtain large images in the camera of distant objects. We both worked on the system of throwing the nodal point of the lens forward, and beyond the lens itself, in order to obtain a large size of image without employing a camera of inordinate length. In the preface to a recent contribution of mine upon this subject I have given credit to Duboscq for ante-dating me, but a reference to his patent shows that he employed the system known as secondary magnification. Dr. Miethe concerned himself more particularly to special combinations of positive and negative lenses, while I attacked the problem in a manner which should make any lens then in existence convertible into a telephotographic system. Since I briefly referred to the history of the subject, so far as I had been able to trace it, Dr. von Rohr has come across a work by Canon Zahn, of Wurtzburg, an extract from which appears in THE BRITISH JOURNAL OF PHOTOGRAPHY, May 11, 1900. It is quite clear that Zahn not only applied the Galilean telescope for forming enlarged images, but fully understood the principle involved. Plateau mentions another work by Zahn published in 1685 "Oculus artificialis teledioptricus," &c. This volume probably describes the instrument itself more fully, and might

throw more light upon the subject, than is contained in the reference-made by Dr. von Rohr. The discovery of Zahn's work was particularly interesting to me, for I take it that no earnest worker can have greater satisfaction than to feel that able men in times gone by have given thought to problems that we may set ourselves at the present day.

In 1895 Dr. Rudolph paid considerable attention to special constructions for telephotographic purposes and introduced single cemented telepositives to be used in conjunction with single cemented triple negatives. The latter are made of such a form that placed in one position they perform best with his telepositives, but when reversed are available for use with ordinary corrected lenses.

During the course of this year I have been engaged upon a new form of telephotographic lens which is specially designed for hand-camera workers; I hope to describe it to you shortly, and that it may be of value.

THOMAS R. DALLMEYER, F.R.A.S.

PAINTING AND BLOCKING-OUT NEGATIVES AND TRANSPARENCIES.

(The following very practical article is reprinted from the *Photographic Record*, the quarterly organ of the Manchester Amateur Photographic Society.)

IT may often happen that the amateur or professional photographer comes across subjects which he finds would be more suitably and better rendered, for the purpose he has in view, were he to remove them entirely from their immediate surroundings.

The background may be unsuitable, or some object close at hand too prominent, the removal of either of which may be impossible. Hence comes the necessity of either removing the object to be photographed to more suitable environment, or if that also is impossible, photographing the subject where it is and by after treatment of the negative correcting this defect. In such circumstances, this process of "blocking" or "painting-out" negatives, will be of great usefulness. By its means any portion of a negative not required to be printed from, can be completely obliterated; and thus a great power is placed in the hands of the photographer. This power may be wielded in a variety of ways, and for an astonishing variety of effects, under the hands of a careful and thoughtful worker, and, though personally my experience has been limited to certain branches, still a few hints which have been gained by that subtle and often expensive teacher, "experience," may prove helpful, and may indeed to the earnest mind suggest some fresh scope for this branch of work.

It is in a spirit of inquiry that I give this demonstration, for many of you have I know some time or other utilised the same process, and no doubt gained some knowledge which may be useful to me. I can only hope that in the discussion afterwards they will give the benefit of what they may have learned, for it is chiefly by such mutual help that advancements are made.

I don't know that my methods are any different to other workers, or that my knowledge is either new or stale, for I never remember seeing an article on the same subject in any of the photographic books or periodicals—what little I do know has simply been "picked up" in the course of about six years' work. Under these circumstances it will perhaps be best to explain how I have been accustomed to work, and give you any helpful hints I know of, treating you all alike as "beginners" and making the explanation in as simple form as possible.

To amateurs, the utility of this power of blocking out portions of negatives will be found most valuable in botanical and floral work, and the photographing of statuary, pictures, coins, &c. It will also be found useful for completely blocking out skies in landscape negatives where it is desired to introduce clouds on a print, or for altering an offending horizon line. The same method of work is applied to all these branches of photography with but slight modifications, so that after describing those I have adopted I will leave you to apply them to whichever branch you desire.

Personally, it is in the photography of machinery that I have found the inestimable value of this process. Being engaged in the engineering industry I have had many opportunities of photographing various new machines, when, in all their glory of new paint and polished steel, they are ready for delivery from the works. Any who have been inside a workshop know the surroundings—the grimy walls, benches and the general disorderly state of all that is near. Amidst these surroundings a new machine has been built up, and is standing ready for inspection and delivery. A photograph of it is of great usefulness both to the designer—and for trade purposes. It is impossible to remove it from its surroundings without pulling the machine to pieces and re-erecting (an undertaking not to be thought of), so that one has to do the best he can with the machine as it stands.

I show you here some photographs of machinery taken under these conditions of environment, also prints from the same negatives after they have been treated with this blocking out process, and you will note the wonderful improvement. The machine previously lost amidst its surroundings, now stands out sharp and distinct, every bit of intricate mechanism previously difficult to locate, now outlined against a perfectly white background, whilst the adjacent machinery, which was so confusing before, is no longer seen. Only a portion of the floor of the workshop remains—just sufficient to show that the machine possesses a foundation. That such an improvement is of a practical value cannot be denied, and it, to my mind, fully justifies the amount of time spent upon the negative.

In some instances the negative, possibly taken under adverse circumstances, or through some error of judgment in exposure or development, has turned out bad. It had been developed some time after the machine had been pulled down and despatched, and though anything but right as a negative it has had to be made the best of, being the only record of the machine.

Here are some lantern slides showing that exactly the same treatment may be applied to statuary. We all know how the statuary in our local museums and public places, are often put up in the most unsuitable spots and corners—that is “speaking photographically,” of course. We want to rid them of their surroundings when we photograph them. How many of us have spent hours in making prints from these negatives—utilising all kinds of dodges to secure a more appropriate background than perhaps an iron railing, a papered wall, or a wall hung with pictures. (For myself I must admit having a rather pet fancy for such work.) Yet how many of these are successful, or even satisfying to the one who produced them. To those who desire the best pictures of such subjects, I would advise the making of transparencies (enlarged to $\frac{1}{2}$ - or full-plate size if their original negative is only a small one). Paint these out in a similar manner to the lantern slides shown, and after suitable mounting hang them for window or lamp decoration. If we wish to produce a print from such a negative with a dark background produced by this blocking-out process, it is necessary to make a transparency from the negative, block out the portions not required on that, and then make another negative from the result, and print in the ordinary manner. But that is rather a tedious proceeding, and there are perhaps other ways more simple—though undoubtedly if we require a large number of prints from one negative this is the simplest and quickest way.

I have selected a photograph of a machine as an example to show you how to work, for on such a negative you need all the combinations and outside aids it is possible to require. Our object with it is to paint out with an opaque varnish those parts which will be found of use, and which will enable a photographer to do any variety of work he chooses, are as follows :—

A couple of sable brushes, preferably a No. 4 and a No. 8 with fine points.

A No. 8 camel hair brush.

A draughtsman's ruling pen.

An ordinary fine writing pen (say a Gillott 404).

A few French curves.

A short flat ruler or set square.

A bottle of turpentine.

A little Indian ink.

A bottle of black varnish or “Photofake” and

An ordinary retouching frame.

The retouching frame or desk is an absolute necessity, and it is of no use to try and dispense with its services. They are to be obtained very cheap, and indeed are such a valuable acquisition to a photographer for a variety of purposes, that few will be found who do not already possess one. I would advise those about to purchase, to secure one which allows the negative to be freely changed from a vertical to a horizontal position. The advantage of this will be explained later.

In working, place the frame in front of a window (preferably looking north to avoid the sun's rays), and by the judicious use of a blind and some brown paper, concentrate the light admitted to the room on to a sheet of paper acting as a reflector, on the base of the retouching frame. Placing the negative in the frame—film uppermost—proceed to carefully examine it. Note all the little corners that have to be filled up, and all the portions of the background which can be seen peeping through the intricacies of the machine. Always have a rough print off the negative at hand for comparison and reference. I generally secure an ordinary ferro-prussiate print for this purpose—they are easily and cheaply procured, and unless there is a lot of most intricate detail work to be blocked out, they are quite good enough.

The first thing I would ask you to remember is this: do not start from the top of the negative and work downwards, always start from the centre and work outwards, turning the negative round on the retouching frame as required. If you have a very steady hand and are expert in the use of a colour brush, pour a little of the black varnish into a small pot or saucer, and, using the No. 4 (fine) sable brush, proceed to paint out all the small portions of the background that are seen through the framework of the machine. Start from a corner (do not work into one) and with a fine line paint round all the small portions of the outline, leaving the long curves and straight lines alone. If you are not thus skilled with a brush, use the writing pen dipped in Indian ink instead. Hold it lightly in your hand at about an angle of 45 deg., with the surface of the plate. Do not press the point of the pen into the film, but pass it smoothly and evenly over the surface. Take care not to try to work too quickly. For the straight lines and long curves it is preferable (whether you are skilled with the brush or not) to use the draughtsman's pen and rule the lines with Indian ink, you are then almost sure to have them smooth and even. The importance of this is made very evident, if enlargements are to be made from the negative afterwards. One must needs be a most expert draughtsman to be able to paint a straight line accurately, by the use of a brush alone. Let those who doubt this statement try and make a line, say a couple of inches long. At first glance it may appear perfectly true, but test it!

It is this difficulty of accurately presenting a long straight line which causes the greatest trouble, and if one judges from the specimen prints of such photographs, exhibited outside many of the leading professional establishments in the city, one cannot help but come to the conclusion that they have not yet mastered the secret of successful work. On a recent negative by one of the principal firms of professionals who make a speciality of this class of work, they had, to their mind, satisfactorily overcome the difficulty by glueing on the film side of the negative a piece of opaque paper that had a clean cut edge. This method is undoubtedly ingenious, but as it could only be brought into use on outside lines, can hardly be called satisfactorily. On the same negative a portion of the background, showing between the different parts of the machine, had been left severely alone. The space was about 1-64th of an inch in width and about 6 inches in length, having about three breaks in that distance. The line was perfectly sharp and true, being between two polished cylindrical surfaces. Had they attempted to put it in by the use of a brush it would have ended in disaster, and this they evidently knew. Yet by means of a ruling pen this would be a comparatively easy undertaking.

In using a ruling pen, hold it perfectly vertical to the surface of the plate and do not try to make the lines too broad. See that it has a smooth and well-rounded point, and in using it hold it lightly and loosely between the first three fingers and the thumb, allowing the little finger to act as guide and to steady the hand as it passes over the plate. Unless you do this you are apt to cut into the film with the point of the pen.

As Indian ink dries very rapidly on exposure to the air it is necessary to constantly wipe out the ruling pen with a piece of rag. Do not take up too much ink in the pen at a time, and before using carefully wipe the outside of the nibs perfectly dry. Use ink that is entirely free from grit and dust, and of such a consistency as will allow it to flow freely and evenly from the pen.

If you require to smooth a jagged edge or to remove a line or any portion of a line which has been put on the negative by Indian ink, this can be very easily done by using a brush dipped in water; but care must be taken to wait until that portion of the negative has completely dried before going over it again with a pen, or disaster will result in the shape of a torn film.

The use of xylonite set squares and curves, such as can be obtained from any drawing material dealers, is to be commended, as, being transparent, they enable you to see exactly the place and length of line you require.

When the negative has been completely outlined by these means, then proceed to fill up the spaces left, with the black varnish, using the large sable brush for the purpose, remembering the note previously given about working outwards from a corner (not into it), and being careful not to have the brush too full of varnish. Should it happen that you accidentally overstep the borderline of Indian ink with the varnish, immediately wipe it back with the tip of a dry finger before it has time to set: the smear, if one should remain, can be easily washed off afterwards by a brush dipped in clean turpentine.

Always have an old piece of cloth or duster handy to wipe off any varnish that may from time to time thus find its way on your hands, otherwise you may cause yourself a lot of extra trouble and annoyance. Whenever you are washing out, whether with turpentine or water,

always wash away from the parts that are to be left showing—that is wash on to the portions blocked out. Should the varnish become too thick to be used evenly, thin it down by the addition of a little turpentine, but only do this sparingly as the turps makes the varnish sticky to the touch when used, and very considerably increases the time of drying.

Always clean your brushes after use, and do not allow the varnish to set hard on them, for nothing so soon destroys the points. Varnish brushes can be cleaned by dipping in a little turpentine and afterwards washing with soap and water. Use brushes with tin ferrules, not with quill holders. An old negative glass will be found useful to be at hand for the purpose of working up a point on the brushes, when a delicate piece of detail work has to be done.

In leaving a portion of the floor showing I generally follow out the lines of perspective, ruling four lines around the base of the machine with Indian ink, and painting up to that with the varnish. Decide how much of the floor you think it suitable to leave in, and, using the ruler, mark this out in black lead on the print. If the object has been placed square with the lines of the floor or wall, these perspective lines can be put in without much difficulty. When this has been done to your satisfaction, rule corresponding lines on the negative with Indian ink, taking care when doing the floor lines on the far side not to cross over any protruding portion of the machine.

If objection is taken to the hard lines caused by the abrupt termination of the floor, this can easily be softened down by means of stippling with a stiff stencil brush dipped in Indian ink. The perspective lines are set out as before, but half an inch wider all the way round to allow for the stippling. Take a piece of paper with a smooth stiff edge, and laying it along the line so marked upon the negative, proceed by means of short quick dabs with the brush to work along the whole length of the line. Start with the brush protruding about half its diameter over the edge of the paper, and after once doing the length of line in this manner go over it again with, say, quarter of the brush projecting, and so until the intensity of the black varnish has been reached along the edge of the paper. Corners are done by placing a piece of paper along each of the two lines, thus forming a V shape.

When first I commenced this painting of negatives I used to coat them with the ordinary transparent protecting medium and worked on the top of that with Indian ink and black varnish, but now I do all blocking out required on the original film and varnish them afterwards for protection if required. This I find answers more satisfactorily, as the bare film is decidedly more easy to work upon, and the protective medium applied when all is done, has the double advantage of preserving both the film and paint out from possible injury.

True, it is easier to make alterations if the negative is first varnished, but these are not growing necessities, rather the reverse, and if the worker decides exactly where and how far a line has to go, before putting it on the film, he will find very little need for the wash brush.

It may be asked why I use this black varnish in preference to other mediums sold for the purpose. Well, its advantages are hardness, quick-drying properties, cheapness and extreme durability. It stands an astonishing amount of rough usage without even the need of a protecting medium. But above all else I use it because of the ease with which it can be used in combination with Indian ink. When we went to block out flower studies, street scenes, and statuary, on lantern slides I undoubtedly recommend the use of the new production called "Photofake." For this class of work there is no ruling to the done—all the work can perhaps be done best by means of a finely pointed brush. It is composed almost entirely of small curves, graceful and sweeping. To do these one undoubtedly needs an artist's hand and tools, not a draughtsman's. They who have a good knowledge of free-hand drawing, or are accustomed to the use of a water colour brush, are the ones who will succeed best in this class of work. Lightness of touch is the main thing to be considered, whether one be using brush, writing pen, or ruling pen. The delicacy of touch can only be attained by constant practice, and to those who would excel in this work I commend this as the first stepping stone to success.

Need I enumerate the many uses this process can be put to? How cloudless negatives can be improved and perfected? How offending trees on a landscape negative can be "stippled" totally away? Trees that offend against the picturesque, and the common laws of composition. How subjects such as those characteristic of Paul Martin can be evolved from a study of humanity in our own crowded streets? No! as I started I will leave off—leaving you to work in whichever direction your tastes or impulses may lead you, hoping that the explanation of one method of working may be of help to another, giving freely of what little knowledge I possess in the hope of further help and assistance being gained from amongst you.

J. W. PRICE.

NOTES FROM THE NORTH.

GLASGOW Corporation have appointed a Special Committee to prepare an illustrated free course of lectures on the leading enterprises under Corporation control. The lectures will be illustrated with lantern views, the intention being to make the ratepayers better acquainted with the leading schemes on which the rates are at present being spent. For many winters past the Art Galleries Committee have carried on a free course of Saturday Evening Lectures by the aid of the lantern. These lectures have been mainly intended to promote a fuller appreciation of the art treasures in the possession of the city. This winter it is proposed to devote the course to a series of lectures bearing specially upon the various departments of the Art Section of the 1901 Exhibition. Every winter witnesses the opening up of new fields of usefulness for the limelight lantern.

A year ago, when the whole country was agog with excitement over the attempt of "Shamrock" to win back the America Cup, the "Glasgow Evening News," by the help of Mr. Lizars, organised an open-air lantern and cinematographic entertainment on a huge scale, the slides and animated pictures being interspersed in the course of the evening with bulletins showing the progress of the races. Crowds estimated to number from thirty to fifty thousand witnessed the displays nightly. Last week the proprietors of the "News" repeated their demonstration in connection with the General Election, and the crowd each evening was as large as those which took an interest in the yacht races. Impromptu slides were prepared by Mr. Forrest Niven, the "News" artist, as the results came in, the "hits," imperial and local, being greatly relished by the street audiences. These impromptu slides were written or drawn on cover glasses with a soft pen charged with thickish Indian ink. The drying was accomplished in a second by holding them over a gas flame, and in another second they were put into the slide carrier and thrown on to the gigantic screen. Although produced in this rough and ready fashion, they were thoroughly effective.

Mr. John Stuart, owing to indifferent health and bereavement, was unable to send any examples of his work to the Royal Exhibition. He is arranging to pay an early visit to the Metropolis. Like most provincial readers of the "B.J.'s" trenchant criticism of the Salon exhibits, his curiosity has been whetted, Queen of Sheba like, to see if the reality is in accord with the report. He is also planning his exhibit for the International Exhibition in Glasgow next summer.

Several very good 15 by 12 enlargements, taken by Mr. A. Cowie, Alloa, with a $\frac{1}{2}$ -plate "Challenge" camera are on view at present in the window of Mr. Lizars' retail warehouse in Buchanan-street. Mr. Cowie is an excellent amateur exponent of pictorial photography, but as he belongs to the non-exhibiting school, few, outside the circle of his friends, have many opportunities of seeing his work. His "Melrose Abbey" is a splendid piece of architectural photography.

Another amateur, Bailie Primrose, who has of late years almost forsaken his favourite hobby, is re-entering the field. The "Challenge" type of camera has been his choice since its introduction, and he, too, has several enlargements on view in Mr. Lizars' window.

Mr. W. M. Warneuke recently completed two sumptuous albums to the order of the heads of the numerous departments of the Caledonian Railway for presentation to Sir James Thompson, ex-General Manager, and Mr. William Patrick, his successor. The albums contained the portraits of the donors to the number of over forty, while the front covers were richly decorated with oxidised silver in alto reliefo, the arms of the Caledonian Railway Company being in the centre.

Another commission Mr. Warneuke has in hand, and one in which his talent for pictorial photography is finding free scope, is the preparation of an album for Mr. R. B. Cunningham Graham, ex-M.P., and one of the heroes of the Trafalgar-square riot, for his participation in which he was sent to prison. Mr. Graham has sold the ancestral estate of Gartmore, with its ancient mansion house, and Mr. Warneuke has been occupying every spare day of late photographing the mansion, its most interesting interiors, and the numerous scenes and picturesque spots associated with the family history on the beautiful estate. The memorial volume is to go with Mr. Graham to his flat in London to serve as a visible reminder of the Graham family's ownership of the Gartmore estate for six hundred years, and of his own thirty-five years of happy married life in the mansion he quits for ever at Martinmas.

"Photography as Applied to the Register of Lasines" was the subject Mr. J. C. Lennie chose for his presidential address to the Edinburgh Photographic Society last week. For the benefit of non-Scottish readers, it may be advisable to state that "Lasine" is a Scots Law term meaning the act of giving legal possession of property, or the legal instrument or document by which the fact is proved. It was in the second sense Mr. Lennie used the term, his aim being to show how the process of photo-zincography might be applied, and, under the Land Registration Bill, was likely to be applied to the copying of writs. The old process was slow, and apt to become congested, while the labour of collating was very harassing to those engaged in it. The abolition of the old method and the introduction of photo-zincography would, in his opinion, confer undoubted advantages upon the public, while the cost of the new process was, at any rate, not greater than that of the old. Mr. Lennie exhibited an experimental volume of the writs of Fife for one month, illustrating the exact facsimiles, a necessary condition of the process, produced by photo-zincography.

A Limited Liability Company has been registered—George Bell and

Co. (Ltd.), 152, Sauchiehall-street, Glasgow—to acquire the business and assets of the sequestered estate of George Bell and Co., Photographers; capital, £1,000 in £1 shares. The first subscribers are William D. Whyte, optician, 144, Broomielaw; James Whyte, photographer, 152, Sauchiehall-street; John Walker, photographer, 152, Sauchiehall-street; James Neil, jun., shipowner, 101, St. Vincent-street; Arthur M. Crossley, inspecting engineer, 52, St. Enoch-square; and Dugald B. Johnston, solicitor, 13, York-street—all of Glasgow. This business, originally located in Argyle-street, was subsequently removed to Sauchiehall-street, to a very high building without an elevator.

Professor Mills, of the "Young" Chair of Technical Chemistry in the Glasgow Technical College, is the only one in the city who conducts a class in the chemistry of photography and the technical side of the subject. His course, which has just begun, covers the preparation and testing of photographic chemicals and materials; testing cameras, slides, shutters, and lenses; determination of equivalent focal length of lenses; the preparation of gelatino-bromide and similar emulsions, and their application to paper, glass, and other surfaces; testing and comparison of plates; making negatives and transparencies (direct or reverse) with the mirror, and by other methods; use of various developers; enlargement, reduction, and copying; photo-micrography; methods of intensification; retouching; varnishing and varnish making; printing-out methods; combination printing; washing; vignetting; printing by development; collodion processes; collotype; preparation of line transfers; half-tone screens, half-tone transfers, and their printing; photogravure; zincotype; lantern slides, &c. Photographers' assistants are received for short terms of instruction in special departments at a fee of £1 1s. for the first week, and 10s. per week thereafter.

In "The Photographer," a monthly journal of jottings, Messrs. George Mason and Co., 120, Buchanan-street, have provided their customers over a lengthy period with a very readable summary of the month's doings, while laying before them their latest trade announcements. The Albion Albumenising Company have decided to follow suit by issuing "Albion Photographic Chat" once a month in the interests of amateur photographers. This new champion for popular favour at a penny a month prints this "Foreword":—"One distinctive feature of this journal, which, we believe, will recommend it to the photographic public, is the exclusion from its columns of the advertisements of dealers in, or so-called manufacturers of, photographic goods, these goods being palmed off at prices considerably over their market value, by the aid of specious puffery, and through the medium of the Parcels Post—for cash paid in advance. If anything more than moral certainty of being overcharged were needed to accentuate the unwisdom of buying a 'pig in a poke,' it would be safe to say that this could be established more easily in connection with the mercantile system endorsed, or at least supported—we regret to say—by some contemporary journals. For apart from the obvious fact that it is always unwise to make purchases 'in the dark' from irresponsible persons, located at some distant or obscure address, the photographer commonly learns to his disappointment, that there are unaccountable delays in the completion of uneconomical bargains, entered into through the post, as we have described. There is this added source of annoyance, besides the intrinsic badness of such bargains in themselves. A feature of our paper will be the description of materials and apparatuses, new and old, so that they will be well tried and approved. That irritating thing, the mere trade 'puff,' will be excluded. We shall be chary with our adjectives, and stick to facts. And we shall endeavour to recognise those circumstances under which 'comparisons are odious' and misleading."

Studio Gossip.

COLOUR INFLUENCES.—Mr. Havelock Ellis, in the "Popular Science Monthly," has an article on "The Psychology of Red," in the course of which he points out that plants growing under blue glass become insensitive and make no progress; those under red glass attain extraordinary development, but the red is not favourable to the ripening of fruit. The foliage under red glass is lighter, under blue darker than under other colours. Red or orange produces the greatest amount of vegetation, but the finest and earliest fruit is from under clear glass, violet glass causing an increase in the amount of fruit, but at the expense of quality. Marshall Ward and others have shown that the blue, violet, and ultra-violet rays, but no others, destroy bacteria. Finsen makes use of this fact in treating bacterial skin diseases. The physical effects on animals seem opposite in character. Beclard found that the larvæ of the flesh-fly raised under violet glass were three-fourths larger than those raised under green glass: the order was violet, blue, red, yellow, white, green. Young found that violet or blue was specially favourable to the growth of frogs, and that fish hatch most rapidly under violet light. The varying effects on plants and animals, Davenport says, are due to the chemical metabolic changes—what is waste for one being growth for the other. Violet rays are, however, often too powerful a stimulant, irritating the skin. The conditions of sun-burn, snow-burn, and snow-blindness are due to them. This can be averted by wearing a yellow veil or painting the skin brown. Freckles can thus be a positive protection to the skin. Finsen's treat-

ment of small-pox in red-lighted rooms, it now appears, was also known in Europe in the Middle Ages, as well as in Japan and China, red bed covers, curtains, and carpets being used to obtain the effect. Red is also beneficial in measles, the rash speedily disappearing and the fever subsiding under its influence. Marti found that feeble irritation of the skin promotes the formation of red corpuscles, while strong irritation diminishes them and also the haemoglobin. Darkness also diminishes the red corpuscles, while continued exposure to intense light increases them and in some degree the haemoglobin. Finsen has shown that inflammation of the skin caused by chemical or violet light leads to contraction of red corpuscles. As to the influence of colours on the nervous system, Father Secchi, in 1895, suggested trying it on the insane. Red rays are found more soothing and less irritating than the total rays of uncoloured light. Garbini found that the only light that soothed angry infants was the light through red glass. Red increases the muscular power and the volume of blood in the limbs; so that red is literally a "warm" colour. Nervous patients are more sensitive to colour influences than are normal beings. Blue glass soothes some insane persons. A sombre and taciturn maniac was benefited by remaining three hours in a red-lighted room, and a man with delusions of persecutions became rational under its influence. A violent maniac after a few hours in a room with blue-glass windows became calm and gave no further trouble. After many years' experience, Osburne has found that in the absence of structural disease violet light (from three to six hours) is most useful in the treatment of excitement, sleeplessness, and acute mania; red is of some benefit in such cases though to a much less degree. (Violet, it should be remembered, contains red). Gruber found that animals which prefer the dark are lovers of red, while those that prefer the light are lovers of blue. A worm, even with its head and tail cut off, still preferred red to blue. The cochineal insect with eyes removed and head covered with wax still had delicate sense for colour and brightness. The flea had a finer colour sense than the bee, and nearly all the animals that Gruber investigated were more or less sensitive to the ultra-red rays. Among birds, sparrows have an aversion for red and a preference for blue; most other birds seen unaffected by colours. Red, however, is obnoxious to turkey cocks. The fury which red arouses in some quadrupeds occurs among bulls, buffaloes, hippopotami, and sometimes horses.

"A PLACE WITHIN THE MEANING OF THE ACT."—Last week, at the Marlborough-street Police Court, a question of some importance to the ordinary pedestrian was dealt with by Mr. Denman, on a summons taken out by the police against Mr. Frank Curzon, lessee and manager of the Prince of Wales' Theatre, for wilfully obstructing the free passage of the footway. Mr. R. Atkins, barrister, defended. Inspector Brogan stated that on the morning of the 2nd inst. he saw a crowd of thirty of forty people standing on the pavement in front of the Prince of Wales' Theatre looking through lenses at animated pictures of a scene in the piece played at the house. The machine was in the vestibule of the theatre. Witness saw the defendant, and pointed out the obstruction. He replied, "The pictures are on my property, are they not?" Witness replied in the affirmative. "Well, then," answered the defendant, "the crowd outside is for the police to deal with. I shall not remove them till the magistrate makes an order, and then I will." The exhibition was continued, and during the week a constable had to be posted there from ten in the morning till seven at night to keep the people moving. Mr. Atkins: Did you see the pictures? Witness: Yes. Mr. Atkins: Then you helped to increase the crowd. Sergeant Sheppard gave corroborative evidence. For the defence, Mr. Curzon said that no part of the machine projected beyond the premises, and it was so adjusted that to see the pictures a person had to stand at least seven feet from it. The pavement was twenty feet wide, so that there was a clear passage in front of and behind the crowd, but the laying of the electric wires had reduced it by a fourth. It was the taking up of the flagstones that caused the obstruction. Mr. Henry Jalland, the Acting Manager, added that he was in and out all day, and had no difficulty in passing through when the pavement was in its normal state. The number of people looking at the pictures ranged from six to twenty-three. It would interfere with their own booking business if a crowd collected, and there was a switch in the booking office by which the pictures could be stopped. Mr. Atkins argued that there was no wilful obstruction by his client, any obstruction being due to the pavement being up. Mr. Denman: The more you show the pavement was up, the more you show the necessity for everybody to give free passage to the public. Mr. Atkins: Supposing a man went up in a balloon, would you hold that he should be summoned because a crowd collected to see it come down? Mr. Denman: I will settle that when he is down and comes into court. In giving his judgment, the Magistrate said that he looked on these questions as very important, as bearing on one of the great questions of the future—how the rights of the public to the free use of the highways were to be maintained in the crowded cities in which we had the misfortune to live. The more the rights of the public in general were maintained, the more the excess of the rights of the individual must give way. That was the law of Nature, and it was the law of England. The public was entitled to every inch of every highway without the slightest interference by any private individual. In the present instance they had a modern invention which gave enjoyment and amusement, but which could not, by any strain of language, be termed a necessity. There was a similar case some little time ago, in which patriotic tunes were blown off by a gramophone out of a window, and people were prevented from getting along. It was perfectly clear that Mr. Curzon had caused an obstruction, but if he would give an undertaking to discontinue it no fine would be imposed. Mr. Atkins agreed, subject to an appeal. Mr. Denman: I have no doubt about the law. It cannot be said in these days that the streets can be used for shows, that what little remaining room the public has

eft can be used as an auditorium for seeing plays, whether enacted by human beings or pictures. There will be a fine of 40s. and 2s. costs. Mr. Atkins was understood to give notice of appeal.

News and Notes.

THE Gospel Oak Photographic Society.—Mr. W. A. Palmer having resigned the Secretaryship of this Society, Mr. H. Billingsley, of 6, Burghley-road, Kentish Town, N.W., has been appointed his successor.

"**THE Intensification and After-Manipulation of Carbon Prints**" is the subject to be treated and demonstrated by Mr. Ernest Human, at the London and Provincial, on Thursday, the 25th, White Swan, Tudor-street, E.C. Visitors always welcome.

CRIPPLEGATE Photographic Exhibition.—Intending exhibitors are reminded that entries for this Exhibition close on Monday next, the 22nd inst. Exhibitors at the R.P.S. deciding to exhibit at Cripplegate will have their pictures collected free. The Hon. Secs. will be pleased to forward entry forms on application to Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C.

THE Southsea Amateur Photographic Society hold their Thirteenth Annual Exhibition on January 29, 30, and 31, 1901, at their headquarters, 5, Pembroke-road, Portsmouth. There are to be six Open Classes, with silver and bronze medals, also certificates in each class. Full particulars may be obtained from the Hon. Secretary, Mr. Gilbert Wood, 10, Pelham-road, Southsea.

WHEN Mrs. Bishop, who is a member of the Royal Photographic Society, was travelling in China she took many photographs of the people, of typical scenes, and of little-known places. Some of these are being collected into a picture volume, which Messrs. Cassell will publish. Each photograph will be accompanied by notes from Mrs. Bishop's pen explaining its bearing.

MESSRS. J. J. GRIFFIN & SONS, LTD., of 20-26, Sardinia-street, Lincoln's Inn-fields, write:—"We regret to find that in the brief report which we sent you of a demonstration by our Mr. Nightingale, before the Walton Society, in which he developed an Ilford Chromatic Plate two years old, which resulted in a perfect negative, without fog, no mention was made of the developer. The developer, of course, was kachin."

A PHOTOGRAPHIC Society for Blaydon.—A meeting held at Blaydon-on-Tyne on October 11, 1900, Mr. Cowling, of South Shields, in the chair, brought into being "The Blaydon and District Camera Club." The following officers were elected:—President, Mr. Arthur Payne, F.C.S.; Vice-Presidents, Mr. R. Cubey and Mr. A. Cunningham; Secretary and Treasurer, Mr. C. E. Hudson, The Bank, Blaydon-on-Tyne.

DEVELOPMENT of Platinum Prints.—A correspondent writes: "I have come across a French formula for platinotype developer, which, as I find it very good, and as to me it presents some features of novelty, perhaps might interest you:

"Water	1000 parts.
Ox. potash	300 parts.
Alum	25 parts.
Tartaric acid	3 parts.

"I use it half strength."

ROYAL Photographic Society.—Technical Meeting, Tuesday, October 23, at the New Gallery, Regent-street, at 8 p.m. A demonstration of the Ozotype Printing Process, by Thomas Manly. The following are the next lantern fixtures at the New Gallery: Saturday, October 20, "On the Peninsular Coast with a Camera," by R. Child Bayley; Monday, October 22, Illustrated Lecture on Colour Photography, by E. Sanger Shepherd; Thursday, October 25, "The Islands and Highlands of Scotland," by John A. Hodges; Saturday, October 27, "Wonders of the Paris Exhibition," by S. J. Beckett. The Exhibition of American Photographs at 66, Russell-square, is open daily from 10 to 4, Wednesdays, 10 to 8. Admission on presentation of visiting card.

OPEN CLASSES will be omitted at the forthcoming Sixth Annual Exhibition of the Borough Polytechnic Photographic Society, to be held during the Christmas week. This step has been taken on the ground that the large amount of work and expense incurred in connection with Open Classes is not warranted by the quality of the work entered. The executive view the matter in the light of open competition being an incentive to better work amongst members of the Society, but when the best workers do not enter, and, further, when the quality of the exhibits received from outside sources is inferior to that shown by the members themselves, then it is thought that the omission of these Classes altogether is justifiable. The next Exhibition will, therefore, consist solely of members' work, in which there will be no sub-division into subject classes, but awards of equal value throughout will be placed at the discretion of the judges.

Commercial Intelligence.

MR. ANDREW H. BAIRD, of 33-39, Lothian-street, Edinburgh, N.B., is issuing a monthly journal of photographic chat for amateur photographers.

MESSRS. YAMANAKA & Co., of Osaka, Japan, have opened a branch establishment at 68, New Bond-street, London, for the sale of Japanese Art Work, both ancient and modern.

A PHOTOGRAPHER'S ACCOUNT.—Richard Wicks, trading as the Brighton Photographic Company, 57, Clarence-square, photographer, against Phil Newman, 91, King's-road, Brighton, photographer, was a claim for £9 0s. 6d. for goods sold and work done. Mr. J. Laidman was for the plaintiff, and Mr. A. V. Treacher for the defendant. It was not disputed that the plaintiff had done the work, but whether defendant was personally responsible, or Mayall & Newman, Ltd., liable. Plaintiff stated that when he heard the firm of Mayall & Newman, for whom he was doing the work, was being wound-up, he saw the defendant, who said if witness would continue the work he would make it a personal matter, and see that he was paid. Witness consented, and afterwards received three payments on account of £1 each, leaving the amount now claimed due. Miss Taylor, secretary to Mayall & Newman, was also called, and said the Company's business was now being carried on by the defendant. Mr. Treacher pointed out that all the plaintiff's accounts were rendered to Mayall & Newman, and contended that the liability was the Company's, and not the defendant's personally. Defendant stated that he had recently acquired the business of the Company from the Receiver, but the purchase was not quite completed. Witness never agreed to become personally liable, but promised plaintiff that, as Managing Director, he would give the matter his best attention. The £3 paid on account was the Company's money. His Honour found for the defendant.

THE Warwick Competitions.—The following is the list of awards of the Warwick Competition for October:—£10 Prize, H. Price, Dennis Vale, Stourbridge, "A design for a Fan"; £5 Prize, W. Kilbey, 57, Pagoda-avenue, Richmond, Surrey, "Diving"; £1 Prizes, J. W. Anderson, Darncombe-street, Moss Side, Manchester, "Conway Castle"; W. Baker, 215, Lewisham High-road, London, S.E., "An Animal Study"; Miss Nelly Blakeley, 5, Wild-road, Birkdale, Southport, "Roses"; Mrs. Delves Broughton, 4, Embankment, Bedford, "The Fallen Monarch"; J. S. Carbines, 13, Warbreck-road, Aintree, "The Quay at Smyrna"; Albert Durn, photographer, Wotton-under-Edge, "Mammy's Pet"; Evan Griffiths, The Square, St. Columb, "Companions"; H. A. Briscoe Harrison, Montague-road, Edgbaston, "Cottage at Knaresborough"; W. Ives, 21, Edinboro'-grove, Armley, Leeds, "Reredos, The Priory"; J. McCleery, Stranmillis-road, Belfast, "Golfing at Newcastle"; F. J. Mortimer, 10, Ordnance-row, Portsea, "Washing Up"; D. Murray, 49, Queen-street, Wolverhampton, "Homeward Bound"; J. D. Murray, Quarry Wood, Ore, Hastings, "Highland Children"; J. C. Oliver, 2, Royal-terrace, Glasgow, "A Good Aim"; W. Page, 36, Ash-street, Walworth, "A Kitchen Interior"; W. R. Prior, Finchley-road, South Hampstead, N.W., "China Tea Service"; A. J. H. Roberts, 5, Castle-arcade, Cardiff, "A Difficult Landing Place"; R. C. Ryan, 43, Compton-avenue, Brighton, "A Somersault Dive"; H. D. Trenchard, 34, Fengates-road, Redhill, "Supplication"; J. Waterall, 387, Chester-road, Manchester, "Doorway in Gloucester Cathedral."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
23	Birmingham Photo. Society ..	Atmosphere. C. T. Cox.
23.....	Royal Photographic Society ..	{ Demonstration: Ozotype Printing Process. Thomas Manly.
24.....	Borough Polytechnic	{ Orthochromatic Photography. E. Sanger Shepherd, F.R.P.S.
24.....	Oroydon Camera Club	{ Film Photography. Hector Maclean, F.R.P.S.
24.....	Photographic Club	{ Demonstration: Meyer's Silver Phosphate Process. G. E. Brown.
24.....	Redhill and District	Prize Slides.
24.....	Sefton Park	Liverpool to Niagara. Rev. C. C. Eleum.
25.....	Bognor	{ Demonstration: Kodak Films, &c. J. A. Heir.
25.....	Hull	{ Demonstration: Velox Novelties. Donald A. Nightingale.
25.....	London and Provincial	Paper by Ernest Human.
26.....	Borough Polytechnic	{ Instruction Evening: Printing and Toning P.O.P.
26.....	Croydon Microscopical	{ Exposure and Development. Rev. F. C. Lambert.

WEST LONDON PHOTOGRAPHIC SOCIETY.

THE Twelfth Annual Meeting was held on Friday, October 12, Mr. G. F. Blackmore in the chair.

The Secretary's Report showed that the Society had enjoyed a prosperous year, that the membership had increased, and that the attendance and the interest shown in the discussions had been very gratifying to the executive. In addition to a number of practical demonstrations and lantern lectures, a series of lectures to beginners had been successfully carried through. The Annual Exhibition was held in February, and was well attended by the public. Mr. C. O. Murray had kindly furnished a written criticism of the pictures from an artist's point of view, and the thanks of the Society were due to him for his valuable services.

The following officers were elected:—President, W. J. Bull, Esq., M.P.; Vice-President, W. Collett; Hon. Treasurer and Assist.-Secretary,

A. E. Cockerell; Hon. Librarian, W. Taylor; Hon. Lanternist, R. Horton; Council, A. C. Beard, G. F. Blackmore, W. A. Brown, M. W. Cockerell, A. Ebbs, G. Lamley, H. Selby, L. Selby; Hon. Secretary, J. Brown, 28, Weltje-road, Hammersmith, W.

The newly-elected President briefly thanked the members for his election. He said he took a considerable interest in photography, and hoped to be more than an ornamental President, and he would do all he could to further the interests of the Society.

The arrangement of the winter programme was then proceeded with, and all dates filled up. The next meeting will be held at the Society's rooms, Broadway Hall, Hammersmith, on the 26th inst., and intending members are requested to write to the Secretary, who will be pleased to furnish information.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 11.—Mr. R. Beckett in the chair.

Mr. E. A. Robins, of Messrs. Kodak, Ltd., gave a demonstration on the latest cameras of this Company. Among them were the No. 1 Panoram Kodak, which takes pictures 7 in. by $2\frac{1}{2}$ in., including an angle of view of 112° , and an entirely new Kodak $\frac{1}{4}$ -plate size (not yet on the market), which is to be called the No. 3 Cartridge. Mr. Robins also successfully developed a length of film, and showed how the curling up could be avoided by soaking the film for about five minutes in water prior to development, the developer recommended and employed being in a single solution as follows, to which is added a few drops of ten per cent. potassium bromide as required:—

Metyl	.....	8 grains.
Hydroquinone	.....	30 grains.
Sulphite soda	.....	$\frac{1}{4}$ ounce.
Carbonate soda	.....	$\frac{1}{4}$ ounce.
Water	.....	10 ounces.

Mr. A. L. Henderson then read a paper on "Films in Photography." He showed some waxed paper negatives that were made in 1845, and were still in perfect condition. A number of negatives on various kinds of paper were also shown as results of recent experiments.

In the opinion of the meeting, the film giving the best result was that prepared on coagulated albumenised paper, and which, Mr. Henderson remarked, was extremely difficult to procure.

Mr. Bullen asked Mr. Henderson if he had found any great difficulty in coating waxed paper supports, and also if there was any difficulty in getting the finished negatives to strip. Mr. Henderson replied that he had found no great difficulty in either.

Mr. Everitt remarked that he thought the chief obstacle in the way of the manufacture of paper film was the difficulty of obtaining a suitable support; a film must, to a considerable extent, be permanent, and until a suitable support was found glass only could be used. Mr. Everitt warned those members who intended following up Mr. Henderson's experiments to use pure bees-wax only, as very few combs now were pure wax, owing to adulteration, and Mr. Everitt suggested that the wax be very carefully selected.

CROYDON CAMERA CLUB.

THE Platinotype Company's portrait lamp, which was first made known by its inventor, Mr. W. H. Smith, at the Club last year, has since been both simplified and improved. Hence Mr. Smith on Wednesday, the 10th, gave a short address, partly explaining how and why he had modified his original pattern, and partly directing attention to the correct way of using the lamp, and what to guard against. For, as already announced, one of Mr. Smith's lamps will be shortly at the disposal of members of the Club for making figure studies after dark.

Some eight years ago Mr. Smith attempted to take portraits by a less perfect form of oxymagnesium lamp, and, to overcome the excessive shadow, used a swinging lamp; with this arrangement a portrait of Capt. Abney was taken by Mr. Smith at the London Camera Club. A few weeks after Mr. Smith brought out his new lamp last year at the Croydon Camera Club, a German wrote him a curiously funny letter, insinuating that Mr. Smith was merely a plagiarist, in support of which he cited the lecture and demonstration above referred to at the London Camera Club, quite unconscious that Mr. Smith was the man who gave the lecture in question. Prior to making some negatives with the lamp, the lecturer handed round about forty panel portraits taken by himself at the Photographic Convention. They included speaking likenesses of many of those well known in photographic circles. As an example of the power of the oxymagnesium light, Mr. Smith has succeeded in taking a portrait with the light screened by canary yellow medium. Several portraits of members present were taken, including Messrs. Hawkins, Bennett, Stanley, &c. After remarks and questions by Messrs. Salt, Watson, Irving, Isaac, and others, at the instance of the President a hearty vote of thanks was adopted with much applause, in replying to which Mr. Smith stated that the way in which his demonstration had been received by the goodly assemblage of his fellow-members was in itself ample reward for the trouble he had been put to, and if any member required further instruction in the use of the lamp, screens, &c., he would with much pleasure give it during any evening arranged.

Aintree Society.—At last week's meeting, Mr. Nightingale, on behalf of Messrs. John G. Griffin & Sons, gave a demonstration on their new developer kachin, a particularly clean developer, and from which there is no fear of fogging the plate, even during prolonged development, and with good keeping qualities, either in bulk or solution, with the advantage of entire absence of stain, which is one of the disadvantages with our old friend pyro. Kachin is also very suitable for isochromatic plates.

FORTHCOMING EXHIBITIONS.

1900.

- October 19, 20 Rotherham Photographic Society. Hon. Secretary, H. C. Hemmingway, Tooker-road, Rotherham.
 .. 19-Nov. 3 ... Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
 .. 19-Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
 .. 30-Nov. 3 ... Sefton Park Photographic Society. Hon. Secretary, G. Birtwhistle, 7, Gainsborough-road, Sefton Park, Liverpool.
- November 7-10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
 .. 12-17 Ashton-under-Lyne.
 .. 19-24 Waterloo and Blundellsands Photographic Society. Hon. Secretary, W. G. Eyre, 2, Mersey-road, Blundellsands.
 .. 21-23 Hackney Photographic Society. Hon. Secretary, W. Selfe, 70, Paragon-road, Hackney, N.E.
 .. 21-24 Cleveland Camera Club. Hon. Secretary, F. W. Pearson, 98, Victoria-road, Middlesbrough.
 .. 22-24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.

1901.

- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Patent News.

THE following applications for Patents were made between October 1 and October 6, 1900:—

- CAMERA SUPPORT.**—No. 17,429. "Improved Camera Support." Complete specification. G. W. HALL.
NEGATIVES.—No. 17,581. "Improvements in the Production of Autotype Negatives." Complete specification. A. BRANDWEINER.
STANDS.—No. 17,632. "Improvements in and in the Construction of Supports for Cameras, Telescopes, Theodolites, and other like Articles." Complete specification. A. KAUFMANN.
OPTICAL EFFECTS.—No. 17,707. "A New or Improved Apparatus for Producing Optical Effects, especially suitable for Advertising and like Purposes." H. F. STANDING.
SHUTTERS.—No. 17,716. "Improved Means of Operating the Shutters of Photographic Cameras." J. V. WELDON.
STEREOSCOPES.—No. 17,727. "Improvements relating to Stereoscopes and other like Apparatus for Exhibiting Pictures." A. E. WOODS.
STANDS.—No. 17,736. "A New or Improved Means for Attaching Cameras and other Instruments to their Stands or Supports." J. J. HACKETT.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

BLUE PRINTING.

To the EDITORS.

GENTLEMEN,—I have read the article in the current issue of THE BRITISH JOURNAL OF PHOTOGRAPHY on blue printers' appliances with considerable surprise. For instance, you state that "in this country the existence of an independent blue printing establishment, to draw its custom from local engineers, architects, &c., &c., does not appear to have occurred to any of the photographic craft." I may say, however, that in Manchester alone there are five or six firms who make a speciality of this kind of work, and there are also a large number in London, Liverpool, Glasgow, Leeds, Derby, and other places, so that you will see there is very keen competition in this business.

You have also evidently been misled as to the time required for printing, as it would indeed be an exceptional light that would give prints every minute, especially in large towns. Then, again, with reference to the cylindrical copying frame, you say that it is stated forty

30 by 40 inches) prints can be turned out per hour. In my place of business this copier is in daily use, and I venture to state that he would be a good printer indeed who could load and unload only the frame 40 times in one hour with 30 by 40 in. prints without allowing any time for printing. The maker of the apparatus, according to his circular, only claims to be able to print two 30 by 40 blue prints in three minutes, and this, allowing, say, four minutes for loading and unloading the frame, gives two 30 by 40 prints every seven minutes, or, say, 17 prints per hour. According to my experience, however, 10 to 12 blue prints per hour from one machine is good work; black and white prints take considerably longer, and can be produced at the rate of about six or eight per hour.

The description of the action of the electric copier is also slightly inaccurate. You say: "It is connected with a simple mechanism whereby it acts as the motive power for slowly rotating the cylinder as it descends." The cylindrical printing frame, however, does not rotate, as being circular and the light being at the centre of the circle, every part of the sensitised paper gets evenly illuminated as the arc light descends from the top to the bottom of the cylinder at a uniform speed.

I may say that I look upon THE BRITISH JOURNAL OF PHOTOGRAPHY as an old friend and adviser, and have written this letter, not in a fault-finding spirit, but merely to correct any false impressions that may be formed of the large amount of work that can be turned out by the blue and kindred printing processes in a short time, and also to point out that the English photographers are as far ahead with the industrial applications of photography as are our confreres on the Continent and in the States.—I am, yours, &c., H. ENTWISTLE.

29, New Cannon-street, and 45A, Market-street, Manchester.

To the Editors.

GENTLEMEN,—In the article on "Blue Printing" in last week's BRITISH JOURNAL OF PHOTOGRAPHY, you wonder why professionals do not add his to their ordinary work.

Let me give my version. I approached an engineering firm on the subject some time ago, and their reply was that they never allowed their plans or tracings to be taken off the premises to be printed, as it would be very easy for the printer (outside) to steal copies of their plans, and dispose of them to rival firms, who would thus profit by their unpatented ideas and improvements.

They evidently possessed a high opinion of the honour of photographers, so I said no more about the subject.—I am, yours, &c.,

October 15, 1900. OTHELLO. [We shall refer to this subject in our next. Eds.]

THE TRAILL TAYLOR MEMORIAL.

To the Editors.

GENTLEMEN,—I shall be much obliged if you will inform the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY that the third Traill Taylor Memorial Lecture will be delivered by Mr. F. Ives, on November 16, at the rooms of the Royal Photographic Society. The subject of the lecture will be "The Optics of Trichromatic Photography." Mr. Ives informs me that he will treat the subject from the historical and practical aspects, with illustrations and demonstrations, and that he will have some quite new things to exhibit.—I am, yours, &c.,

P. EVERITT, Hon. Sec.

88, Evering-road, London, N., October 13, 1900.

THE IMPERIAL DRY PLATE COMPANY, LIMITED.

To the Editors.

GENTLEMEN,—Owing to the continued growth of our business, we have again found it necessary to increase premises, plant, and staff. We now have our new factory in full working order, and hope to be able to clear up all outstanding orders during November. Meantime we beg the forbearance of our friends, and assure them that no efforts are being spared to supply all needs.

We take this opportunity of announcing that we have arranged with Mr. John Howson to take a position in the Company as from Dec. 1.

Thanking you, in anticipation, for allowing us to address the trade and public through your columns?—We are, yours, &c.,

THE IMPERIAL DRY PLATE CO., LTD.,

J. J. ACWORTH, Ph.D., &c., Managing Director.

Cricklewood, London, N.W., October 13, 1900.

AN INVITATION.

To the Editors.

GENTLEMEN,—I shall be glad if you will allow me, through your columns, to announce that the members of the Photographic Club will be pleased to see at their meetings any amateur or professional photographer from the provinces who may be in London for the exhibitions. The meetings are held at Anderton's Hotel, Fleet-street, every Wednesday evening, at eight o'clock.—I am, yours, &c.,

EDWARD A. NEWELL, Hon. Sec.

4 Maiden-lane, Queen-street, London, E.C., Oct. 11, 1900

THE LIPPMANN PHOTOGRAPHS AT THE R.P.S.

To the Editors.

GENTLEMEN,—I found in the course of a visit to the R.P.S. Exhibition that the only lighting available is fatal to the unfortunate Lippmann exhibits which—all exceedingly bright with a suitable side-light (diffuse)—show hereabout as flat and uninteresting as Salon prints. As the poor effects (worsened by the placing of the heliocromes at wrong points of view in some cases) may well disgust the interested visitor who hears so much of them, and will see so little, I dare say a timely caution might not be thrown away.—I am, yours, &c., E. D. FAWCETT.

Livermead House, Torquay.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

J. A. Horsburgh, 4, West Maitland-street, Edinburgh.—Photograph of G. M. Brown, M.P.

BORDER.—(1) Not to our knowledge, which goes back to 1885. (2) They are not now to let.

J. H. A.—Qualitatively between the five you name there is perhaps nothing to choose. For lightness and compactness No. 2 possibly stands first; as regards the others, each meets your special requirements.

COPYRIGHT MATTERS.—P. W. M. asks us how to copyright a photograph, and also if it is necessary to mark each print.—In reply: Send our publishers 1s. 7d. and two prints, and they will effect registration for you. It is not necessary to mark the prints.

PHOTO-RELIEF PORTRAITS.—J. H. WILLMORE. For depositing the copper on the relief a Daniel or a Smee battery is suitable. The latter is the form in most general use by those who do not employ a dynamo. It is more cleanly and convenient in use than the Daniel form, but both are good.

SEASON ENGAGEMENT.—PRINTER. We have answered several queries similar to yours lately. An engagement for "the season" is an indefinite term, and may mean any period. Unless you have an agreement for a specified time, you are liable to be discharged at a week's notice, as you are only a weekly servant.

METAL SPOTS ON PRINTS.—N. H. H. The spots on the prints sent are clearly due to the paper, and not to the manipulations. They appear to be caused by metallic particles in the paper itself, as they show even more strongly on the back than they do on the front. There is no way of avoiding them, except by changing the paper.

G. WILSON.—The only way of ascertaining if the photograph is copyright or not is by searching the register at Stationers' Hall. If, however, as we surmise, it was produced in Germany, and it is copyright there, no register of it will be found at Stationers' Hall, but it is copyright nevertheless under the International Copyright Act.

PERMANENCE OF SEPIA-TONED BROMIDES.—M. W. asks "whether sepia-toned bromides are likely to be as permanent, or more or less so, than the ordinary black ones?"—In reply: Without knowing the toning process employed we cannot say. But our experience of uranium-toned bromides is that they are prone to change colour in a very few years.

BARYTA PAPER.—THOS. CLAYDEN asks where he can get a quire or so of the baryta paper, such as is used for P.O.P. and collodio-chloride. This paper is generally supplied in rolls, and in wholesale quantities. Messrs. Otto Konig and Co. are the wholesale agents for it, but we rather doubt if they supply it in retail quantities. Marion and Co., who use it for their papers, may supply you with it by the quire. In quire of them.

DESICCATED DRY PLATES.—S. VOLMAR asks: "Can you give me any further information about the desiccated dry plates referred to by Mr. Howard Farmer at the Convention? Is there the advantage in them that was stated at the meeting?"—We can add nothing to what was stated in the paper. Mr. Farmer, in it, promised further information later on. You will have to wait for it. Why not test for yourself by drying a few plates after the method given?

A BEGINNER'S DIFFICULTY.—PYRO writes: "On several of my negatives, when placed over a dark cloth, I can see the portrait quite plainly, and it appears very satisfactory, and as a general rule the prints taken from such negatives are thoroughly bad. Could you tell me the reason for this?"—In reply: Not without seeing a negative and a print therefrom. Send us one of each, and we may be able to indicate where you are failing.

COMPRESSED PYRO.—T. S. M. W. writes: "Will you kindly tell me in what way ordinary pyro is injured by being compressed? I have used it so compressed for convenience in travelling, but have not noticed any difference."—In reply: We doubt if the reducing powers of pyro are affected by compression. In recent months we have used several samples without noticing any difference in behaviour between them and the flocculent form.

COMBINED TONING AND FIXING.—B. MAHON asks for a formula for a combined toning and fixing bath that will keep, so that it can be used from time to time, and not require further additions, and yield permanent prints.—We know of no such bath. We are no advocates of combined baths, unless, indeed, they are used under their best conditions, and that would certainly not be when they are used from time to time without further additions.

CARBON ENLARGING DIRECT.—W. S.—Carbon enlargements can be made direct from the negative by means of the Solar camera, but that can only be used when the sun is shining. Therefore it is seldom, if ever, employed commercially in this country. There is no carbon tissue sensitive enough to permit of direct enlargements being made by diffused daylight, as with bromide papers. With the limelight enlarging on carbon tissue direct is quite out of the question.

ENLARGING LANTERN.—W. CONWAY says: "I want to get a good enlarging lantern, with paraffin light, for winter use. Whose do you recommend for a professional?"—It is one of our set rules not to recommend any particular maker's goods, and from this we never depart. Better consult the advertisement columns of the JOURNAL or ALMANACS, and write to the different makers for prospectuses. All the leading makers' apparatus are good, and which is the best is very much a matter of opinion.

UNDER-EXPOSED NEGATIVES.—W. JONES says: "Will you please tell me the cause of the want of detail in the enclosed negatives? They are on —'s quickest plates, and exposed the fiftieth of a second, $f-22$, the same as I have always given on such subjects and got good negatives; so that it cannot be under-exposure."—But it is, and very much under-exposure. You must bear in mind that although the light looks good now, it has not nearly the actinic value it had a few months ago; hence longer exposure is necessary.

INSTANTANEOUS PHOTOGRAPHS IN WINTER.—R. GREENE writes: "I wish to take some instantaneous pictures during the winter months in the country, if the lantern size, if the thing be possible. Will you please tell me the quickest lens I can get for the purpose?"—About the quickest lens that can be had for that size is the "Instantaneous Stereo Lens." It is of the Petzval form, and has a working aperture of about $f-3\frac{1}{2}$. With that, and extra rapid plates, and the shutter set at a moderately fast speed, there should be no difficulty in a fair light.

GLASS POSITIVES.—T. GRIGGS asks: "Is it possible by the old wet-collodion process to get really good pictures; that is, if they are taken in a well-appointed studio, and with a fair amount of skill used in the work? I have been told it is."—The information is quite correct. A good glass positive is a very beautiful photograph, next to the Daguerreotype in detail and gradation. But to produce such results as much skill is required as in the production of a high-class negative. This skill is not expended on the production of this class of picture nowadays.

REMOVING PAINT FROM STUDIO WINDOWS.—LIGHT writes: "In the early summer, when the sun was troublesome, I painted the glass in the studio roof over with blue paint. Now I want all the light I can get. Can you tell me how to get the paint off again? I have tried turpentine, and that does not seem to have any effect."—Make a strong solution of American potash. Apply that to the paint, and it will dissolve it, and in a short time it can be washed off with warm water. Of course, if any of the potash solution gets on to the paint on the sash bars, that will also be dissolved; so care must be used.

ENAMELLING PHOTOGRAPHS.—H. W. writes: "Can you inform me how to enamel photographs, so that they will be washable? Some time ago we had a man from London, who did them for us, and I have been asked to do some like it, but for the life of me I cannot."—Coat a glass plate with enamel collodion, and then, after it has thoroughly set, place it in a dish of water to wash out the ether and alcohol. Then transfer it and the print to a dish containing a warm dilute solution of gelatine, bring the two together and remove. Then squeegee and allow to dry. Before the print is dry, however, a backing paper should be applied, and when the whole is dry the picture is stripped off. We need scarcely mention that the glass must be treated with French chalk, or waxed, before the collodion is applied, to facilitate the stripping.

MOTTLED ALBUMEN PRINTS.—W. H. S. writes: "Will you please give your opinion on the cause of the mottling of the enclosed prints? They are on —'s ready-sensitised paper, a piece of which please find herewith. My printer tells me he takes every care, and he cannot account for the appearance. Some are all right, others like these. I think it must be some fault or other of his."—No, it is not; it is the fault of the paper. It has been sensitised on too weak a silver bath, for we found, on exposing the piece sent to the light, it darkened, with the mottled appearance, instead of an even colour.

RUST ON GLASS.—A. WILMOTT says: "I have a very excellent portrait lens (no name on it) of three and a quarter inches diameter, and one of the back glasses has a sort of yellow stain on the surface. I have tried to get it off with methylated spirit, but that does not touch it. How can I clean it off?"—The glass is what is called "rusted," and there is no method of getting rid of the stain except by repolishing the surfaces, and that should be done by an optician. The stain, however, does not make any practical difference in the performance of the instrument, except that, theoretically, it is a trifle slower. We should advise you to let the lens be as it is.

DAMAGE IN TRANSIT.—PROVINCIAL says: "I sent a negative, from which I expected large orders, to London, to have an enlargement made from it. When it was received back, although it appeared to have been carefully packed, it was broken into several pieces, and the case it was packed in was also broken by the rough usage it had received on the railway. Who is responsible?"—The railway company, of course. But you did wrong in receiving the parcel, seeing the dilapidated state the box was in, without opening it, in the presence of the railway company's servant, and in not signing the delivery form as "received damage." Had you done this, the company could not deny liability. Now they may, as they hold your receipt for the parcel, and that implies that it was received in good condition.

STUDIO BUILDING.—IXION writes: "I am about starting in business as photographer, and would value a few hints from you as to the best way in which to build a studio, and the most convenient size of same. Can you give me the address of a reliable maker of portable studios? What would you advise for material of roof—wood or galvanised iron? Any other information you can give me, such as the best form of blinds, &c., to be used, will be valued."—As our correspondent is evidently a novice in photography, we should recommend him to get Mr. Bolas's work on studio building, published by Marion & Co. From that he will see the form best suited to his requirements and for the site available. A suitable size for professional works is from twenty-five to thirty feet long by from twelve to fifteen feet wide.

THE COMBINED BATH.—W. W. D. writes: "Owing to the fact that I have not time to tone and fix my prints in separate baths, I intend to use a combined one, supplemented by an additional fixing bath. Some months ago I saw an account of the following mode of working with a combined bath for crown tones:—First wash prints five minutes. Then transfer to a bath made as follows:—(a) Hypo solution, 2 ozs. to pint; (b) gold chloride, 1 gr. to oz. For use add 3 ozs. B to 30 ozs. A slowly, constantly stirring. When the required tone is reached, wash five minutes. Then place in a fresh hypo (2 ozs. to pint) bath for five minutes. Finally wash two hours. (1) Please say if results will be permanent. (2) Would results be permanent without the additional fixing bath if I don't use combined bath for more than one lot of prints?"—In reply: (1) If the work were carefully done, we see no reason why the prints should not be reasonably permanent. (2) Doubtful, unless the prints were allowed to be a long time in the bath. If the two baths are used, we don't see that much, if any, time will be saved over the usual method of toning and fixing separately, which is preferable.

RECOLOURING A DAGUERREOTYPE.—W. J. REED writes: "Can you inform me of where I could get an old Daguerreotype recoloured? A friend of mine, a jeweller, had one, and has met with an accident, in not knowing what he was handling, and trying to take off dust has taken the colour off, too. It being a red coat, it is much damaged, and he is in a great way about it, the people he did it for being very put out, and he does not know what to do. Myself I do not know of anyone that can do this kind of work, even if it can be attempted, which I very much doubt; but I should like to know your opinion of the matter. If you could write me direct, or through the JOURNAL, I should feel very much obliged; but, if possible, by letter, as he is most anxious to know, and give some answer to his clients."—We do not know anyone now who could recolour the picture. The Daguerreotype process has not been practised for many years past, and the old Daguerreotype colourists have become an extinct race. We fear, however, that your friend, in removing the dust, has injured the delicate image of the picture; in which case the injury is irreparable. We do not undertake to reply to queries by post.

* * Owing to exceptional demands upon our time and space this week, we are obliged to hold over several answers to correspondents, reviews, articles, &c., including a notice of the American Photographic Exhibition, "Plastic Psychological Syntheses at Russell-square."

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EX CATHEDRÀ.

WE have been pleased at the receipt from Messrs. A. E. Staley and Co., 35, Aldermanbury, E.C., the British agents of the Bausch and Lomb Optical Company, of Rochester, New York, of a copy of the latter house's microscope catalogue. This well-produced book reminds us that in a very important branch of optical work English firms have to face competition, as stimulating as it is keen, from Germany as well as from the United States. We have quite recently heard that at least two prominent London firms contemplate an attempt to recover some of the supremacy in microscope work that has been lost by this country of late years: Let us hope, on patriotic grounds at least, that they will be successful. The book before us deals very fully with a large variety of microscopes and accessories, and prefatory notes which run to 23 pages, describe respectively the facilities for manufacture possessed by Messrs. Bausch and Lomb, and the points to be kept in view when selecting an instrument. There is, too, a chapter on the construction of the American

type of microscope. The factory and the machinery it contains appear to be perfect for the delicate optical work produced at Rochester: and we are obliged in strict justice to compliment Messrs. Bausch and Lomb on the well-directed enterprise which animates all their undertakings. We know only too well that it is the custom of numerous British manufacturers to treat complaints from customers with high-handed indifference and neglect. Mark the difference in the American style of doing things. Messrs. Bausch and Lomb give a guarantee that the apparatus they produce is inspected and tested before being sent out, and they sensibly add: "It is almost impossible for faulty work to pass unnoticed, but in a business so extensive as ours this may occasionally occur. In such cases we cheerfully remedy any defects at our expense." What could be better calculated to secure a client's confidence than the sweet reasonableness which disclaims workshop infallibility, so often hurled at his clients by the stubborn Britisher? Again, say Messrs. Bausch and Lomb, "suggestions regarding improvements in our apparatus and the making of new and useful instruments are desired at all times." Here manufacturers seldom invite such suggestions, and when they are offered neglect is only too frequently the return.

* * *

THE Annual General Meeting of the Photographic Copyright Union, which was held last week, supplied very little business of importance for the consideration of those who attended. Some useful work has been performed during the past year, and the various Copyright Bills that have been introduced into Parliament have been carefully watched. These attempts to supersede the excellent Act of 1862, which, as we have so often remarked, treats photography very well indeed, number three. Evidently the shameless artists, publishers, and others who have vowed a vow to make photographers "sit up" do not know their own mind in the matter for five minutes. Early in the year they introduced their first Bill, the effect of which, if carried, would have robbed the photographer of all legal protection for the work of his brain and hands; later, the wicked measure was withdrawn, and a second Bill was put forth. This gave general satisfaction to photographers, and, indeed, would have left undis-

turbed the rights conferred on them by the Act of 1862. But it was never seriously meant, for so recently as the end of last July a third Bill was presented. This we saw the other night for the first time: and it appeared to us that those responsible for drafting the Bill must have designedly set themselves the task of making some of the clauses as ambiguous as possible. One clause, in particular, which deals with the ownership of the negative, simply defies interpretation: but its aim is apparent. At present the Courts uphold the right of the photographer to the ownership of the negative, but the opponents of photographic copyright would rob him of it. Of course, the Bills to which we have referred are just now only so much wastepaper: we must wait till Parliament assembles to see what new move the haters of photography will make in their disgraceful attempts to injure it by uncalled-for and brigandish legislation. So few photographers seem to realise the dangers of their position that we submit no excuse for again emphatically warning them of it. As regards copyright, we have no faith whatever in the wisdom of the legislature, which, in matters of minor importance, often very stupidly blunders. Hence, next session the proceedings of the anti-photographic copyright party must be closely followed, as, the matter being of no public interest, there are great possibilities in the way of legalised interference with the existing order of things.

* * *

ONE of the oldest and most respected houses in the photographic trade is that of Messrs. Edwin Oborne and Co., Red Lion-square, London, W.C., whose special work is the supply to photographers of every kind of card mounts and stationery for professional and amateur use. The firm has been established for half a century, and for 20 years of that time we have been personally cognisant of the fact that Oborne's cards and mounts have been highly esteemed by photographers. We have very great pleasure, indeed, in drawing attention to the fact that the firm desires to make two special and enterprising offers of their mounts, &c., to photographers and the trade. Before us are two boxes of samples. One includes a large number and variety of specimen cards, envelopes, and photographic stationery generally. Messrs. Oborne ask us to state that they will forward a similar set, post free, to every professional photographer who applies for it. The second box includes samples of tasteful mounts suitable for amateur use. A similar set will be sent, post free, by Messrs. Oborne, to every photographic dealer who applies for it, and encloses a trade card with the application. These two offers of free samples of photographic stationery and mounts are unique in their way, and Messrs. Oborne will no doubt receive a considerable number of requests for them.

* * *

THE colour photographs by the stained film process of Mr. E. Sanger Shepherd that are being shown at the Royal Photographic Society's Exhibition are generally admired by visitors. We had an opportunity of recently examining a considerable number of these beautiful productions in the binocular, as well as the monocular, forms. There is no gainsaying the fact that in the reproduction of coloured artificial objects the process yields results of striking beauty and fidelity. But it is seldom that an outdoor natural scene quite permits of accuracy of translation by any one of the four colour processes now before the public—the colour record or stain of an open view usually falls short of satisfying, even though it may please, the colour sense of the non-scientific individual. Having regard to the years of experimental work

which Mr. Sanger Shepherd has devoted to the subject of colour reproduction by means of photography, and cognate subjects of study, it may not be out of place if we draw the reader's attention to the fact that a little while back he, in conjunction with Mr. R. L. Cocks, established himself in business at 5, 6, and 7, Gray's Inn-passage, Red Lion-street Holborn, as a scientific instrument maker. But this latter description is singularly unindicative of the wide scope of work embraced by Messrs. Sanger Shepherd and Co. For the above-mentioned system of three-colour work, the necessary apparatus is supplied, whilst light filters for three-colour work, orthochromatic photography, photomicrography, and colour block making in half-tone, form an important department in which great accuracy of adjustment and measurement are demanded. The business, in fact, is unique of its kind, for it is the aim of the firm to supply every requisite for the system of colour-photography specified, as well as for ordinary half-tone and colour block making. We saw on a recent visit to the firm's premises that they were well equipped for these purposes. It is quite needless for us to detail Mr. Sanger Shepherd's qualification as one of our leading experts in colour-photography, but to those photographers especially interested in colour and half-tone work, and to men of science requiring specially-constructed apparatus for experimental purposes connected with light and colour, it may be said that the firm's skill and knowledge should be of especial value. The facilities they enjoy and afford are quite special, and in these times of accuracy of measurement in photographic methods their services should be in constant and increasing request.

* * *

"NATURE" of last week prints Professor W. Stroud's British Association paper on range finders, one of which credited to Messrs. Zeiss, of Jena, may have some interest for photographic readers, as it utilises the idea of Helmholtz's well-known tele-stereoscope, in which, as Professor Stroud points out, two parallel reflectors are placed with reference to each eye in such a position as to produce the optical equivalent of an increase in distance between the two eyes, for the purpose of increasing stereoscopic effect, or, as it might be expressed, exaggerating the relief. Now, still quoting Professor Stroud, by placing a telescope before each eye (and the two telescopes may conveniently be incorporated in the frame-piece supporting the reflectors), we multiply the stereoscopic effect still further, e.g., if the distance between the eyes has been artificially increased tenfold by the reflectors, and if the telescopes magnify tenfold, the stereoscopic effect will be increased altogether one hundredfold. This tele-stereoscopic system is thus adapted to range finding: Suppose, says Professor Stroud, we imagine for the moment the instrument fixed, and that we see in the field of view of each eye the image of a pole 1000 yards away. Let permanent marks be made in the focal plane of each telescope exactly coincident with these images. Then, whenever we look into the instrument we shall apparently see a pole at a distance of 1000 yards. Let a similar pair of marks be fixed corresponding to 1100 yards, and so on. Of the several illustrations to Professor Stroud's interesting paper one is a stereograph showing marks in the field of view of a range finder of this kind, so that if the picture be viewed stereoscopically a mental impression as to the distance of any part of the landscape is obtainable by comparison of the marks. The illustration conveys in a graphic manner the application of the stereoscopic range finder.

PHOTOGRAPHING SILVER PLATE, &c.

NOTWITHSTANDING all that has, from time to time, been written on the subject of photographing objects with highly-polished and reflecting surfaces, it seems that this class of work still presents difficulties to some. Only a few weeks back we had to reply to a query, in the Answers column, from a correspondent on this subject. The question was thus put : "I have some silver cups, vases, &c., to photograph. Would you please inform me what is best to be done to them previous to photographing? What preparation is put on to prevent glare or halation?" Now, there is nothing very extraordinary in such a question had it come from a novice in photography, but this one came from a professional—a portraitist—who has been some years in business, and has more than one studio in London. We mention this somewhat by way of justification for once more writing on a subject that has several times already been dealt with in these columns. However, what we shall say now may be of service to those who, like the correspondent referred to, have occasionally to do something out of their usual every-day rut, and have not read what has appeared on former occasions on photographing objects with strongly reflecting surfaces.

Let us consider the photographing, say, of a bright silver vase, by way of example. Here, we usually have a part of brilliant white frosted, or matt, silver, while the highly-polished portions are black—as black as the shadows of a Daguerreotype picture—when seen in shadow; though where the light strikes, it will be reflected as a glittering white. Here it will be seen at once that we have strong contrasts to deal with, and a highly reflective surface. It is true that may be subdued by various dodges. One is to dull the surface of the metal in some way or other. A plan frequently adopted is to dab, or stipple, the metal evenly all over with a lump of glazier's putty. Another is to place a piece or two of ice in the vessel, so as to rapidly cool the metal, and thus cause moisture to condense upon it in the form of dew. With this method it is, of course, presupposed that the atmosphere of the studio contains moisture, although, if it does not, it is easily added by sprinkling the floor with water, or by ejecting some through a scent sprayer. But there are cases where the owners of the articles will not permit any tampering with them. Therefore, they have, perforce, to be dealt with in their integrity, and that is what we shall assume has to be done in the present instance.

Now, here success depends entirely upon the illumination of the objects, and that, after all, is a very simple matter if the well-known law is kept in mind, that the angle of reflection is always equal to the angle of incidence. Thus at whatever angle the light falls on a bright object, it is reflected back at the same angle. Keeping this fact in mind, it will be obvious that, if the reflecting object be illuminated by a front light, the reflections from it will be forwards, and into the lens. Hence, front light must be studiously avoided. In fact, all front and direct front top light should be carefully stopped off. Indeed, it is necessary, in order to secure the best results, to stop off all extraneous light, and to use it from one direction only, and then somewhat concentrated. About the best angle for the illumination of most objects of the kind under consideration is one of 45° , then the reflections from its surface, whatever shape it may be, will be at a corresponding angle and well away from the direction of the camera.

We have just said that the light should be somewhat

concentrated on the object. This, at first sight, may seem somewhat an anomaly, as it will tend to increase the contrasts, which are already strong. Still, it is the best course to pursue in practice. When the subject is illuminated in this way there will be no reflections seen on the focussing screen of the camera. The shadow side will, however, be somewhat dark, but this is easily dealt with by softening the shadows by reflected light. A white screen, placed at an angle corresponding with the angle at which the light falls upon the object, and at a suitable distance, will soften them to any desired extent, and, of course, the reflection from that will, again, be away from the lens. Now, we have our subject illuminated in such a way that there should be no reflections that can be seen from the camera, or will show in the negative.

Having secured a suitable lighting of the object, the next question is that of the exposure. We now have brilliant white metal in the lights, and, if the metal is tarnished, practically black in the shadows to deal with, and, perhaps, an ebony plinth or stand in addition. The great fault with many photographs of silver plate is that they are much under-exposed—too black and white and hard. In all cases the exposure should be a very full one. The old axiom should be kept in mind, "Expose for the shadows, and let the lights take care of themselves." The development must receive care. It should be commenced with but little pyro in the developer—that is supposing pyro is used—so as to get out all the details in the shadows before the lights begin to acquire printing density. In this way, with suitable lighting, perfectly harmonious negatives may be secured of what some consider difficult subjects to deal with.

If there happens to be an inscription on the vase, and that cannot be tampered with by filling up the lettering with a dark pigment, it may be desirable to illuminate it with a still more direct side light than one at an angle of 45° , so that stronger cast shadows are thrown by the sides of the letters. Sometimes the inscription is on a tablet fixed to the plinth. That will usually be allowed to be taken off. When that is the case it should be taken to a copperplate printer, who will fill in the lettering with printing ink, which will simplify matters very much, as then the inscription will be very distinct in the picture. The ink can be quickly cleaned out with turpentine or benzole after the photograph has been secured. It goes without saying that, in all cases when photographing silver plate, backed plates should be employed.

The Use of Gas for Heating.—At the Bradford Meeting of the British Association, Mr. T. Fairly, F.R.S.E., F.I.C., read a paper bearing on this subject containing many points of interest to those employing gas. We recently referred to the work done by Mr. Jones of the Manchester Grammar School showing the effects upon the purity of the atmosphere of the burning of coal gas, a question which, we are sure is not sufficiently considered by the public generally to the extent that is desirable. With regard to burners for heating it may be said that efficiency and perfect consumption go together, or, as Mr. Fairly puts it, "to obtain the best lighting or heating effects, the apparatus must be adapted to the gas." As bearing upon the suitability of gas for heating purposes, the writer of the paper shows the extent to which its illuminating capacity governs its heating efficiency, a matter of considerable importance in view of the belief that is gaining ground that some day Mr. Siemen's idea, of a concurrent supply of two kinds of gas of different prices—one for heating, and one for lighting—will be realised. But, for whatever purpose it be required, Mr. Fairly's

dictum, that "from a health point of view the less gas that can be made to supply the light required the better." The heating valve, he states, is affected by the heavy hydrocarbons, which are of such prime importance for illuminating purposes, though he observes the chief value lies for the former use in the marsh gas and hydrogen. Water gas is coming into much more common use, either enriched with hydrocarbons or as a cheap diluent of coal gas, but we must point out now how very undesirable is it for open burners, used for heating burners, that is, which have no attached flue for carrying away the products of combustion, as there is always danger to health from possible escape into the air of the carbonic oxide which this gas contains so largely.

Portable Gas-producers.—In connexion with the question of cost of gas, there is in last week's *Nature** a remarkable article by Mr. J. A. Purves, upon "Portable Gas-producers," which, if we mistake not, is likely to rouse very general interest. It is, in fact, a description of means for producing with an extraordinary simple apparatus gas of high quality for heating or illuminating purposes. Atmospheric air is charged with the vapour of light petroleum or other similar agent, the action of charging being analogous to the system of dissolving crystals in water (placing them in a loose bag near the surface of the water), the solution as it is formed falling, through its increased specific gravity, to the bottom of the vessel. Mr. Purves points out that air containing hydrocarbons is also heavier than ordinary air, and hence tends to fall towards the ground as it forms. The new apparatus takes advantage of this principle. We have, virtually, a tin canister containing some inert substance soaked with volatile hydrocarbon placed on a perforated shelf two-thirds of the distance from the top of the receptacle. There is a hole in what might be termed the lid of the canister for the admittance of air, there is another hole (to which a top can be fitted) for the exit of the charged air. And that is all. Fuller details will be found in the article referred to; but the broad lines are as simple as we have put them.

Phosphorescence Experiments.—A writer in *Nature*—"A.M.M."—describes some experiments he has made bearing upon those of M. Le Bon upon dark light, which we lately gave an account of. It will be remembered that a statue painted with "luminous paint" was rendered luminous by the radiations from a lamp entirely surrounded by an opaque screen. A. M. M. has obtained a similar result by using a slightly heated object, and his inference is that M. Le Bon's results may have been brought about in a similar manner. The writer exposed a surface similarly painted to the heat radiated from a vessel of boiling water, result *nil*. Substituting a smoothing iron at a "temperature ordinarily used," the paint in about a minute's time "glowed brightly;" but the luminosity differed from that produced by light by the quickness with which it disappeared, the visible light being "comparatively transient."

Lantern Slides ex-Cathedra.—We have every praise for the action of the Sanitary Institute. Frequent applications having been made to it for the loan of slides and diagrams for lecture purposes, the Council have got together a large number of slides relating to sanitary arrangements and appliances, diseases, &c. These slides, numbering altogether over six hundred, may, by application to the Secretary of the Institute, be borrowed at a small charge for lectures purposes, by members and associates of the Institute. The step is a wise one. Lantern slides form one of the most efficient and popular means of imparting instruction, and, if a few more institutions would follow this excellent plan, an amount of information might be conveyed to students and others who could not readily be reached by ordinary channels.

Blue Printing.—Our leader of a fortnight ago seems to have attracted some criticism, some of which is due to misconception. The

* October 18, p. 601.

first of our correspondents whose letters appeared last week will find on reference to our former article that we had in mind the production of "blue" copies by ordinary photographers when we penned our remarks. At the same time we repeat here that we have been surprised to find no work of this kind done (except in the factories of engineers and manufacturers), in large industrial centres of 100,000 and more population. We know that the difficulty suggested by our second correspondent is a real one; but, as we also know from conversation with those interested, one which would disappear in the course of time. Engineers, too, are not the only *clientèle* of such an establishment. Architects, surveyors, estate agents, and inspectors of all kinds are constantly wanting work of this kind, and would make use themselves of heliographic copies more than they do were they more easily obtainable.

The exposures in the Cleveland Works are not, we consider underestimated. We have ourselves superintended the printing of copies at the rate of seventy seconds each, and, in the clear atmosphere of America, printing may reasonably be supposed to be rather quicker. The efficiency of the electric printer was quoted as stated in the original description, the claim of which, as our correspondent has pointed out, is obviously excessive. We had no wish in drawing up our remarks, to depreciate the state of the blue printing craft in this country, and we are glad to learn that the practitioners in our northern cities are fully abreast of the latest improvements in their trade.

DEVELOPMENT WITH PYROCATECHIN.

I APPEND a developing formula for pyrocatechin with tribasic sodium phosphate as accelerator; this substance, suggested to me by Mr. E. Merck, is a convenient substitute for the mixture of ordinary sodium phosphate and caustic soda, and like the latter gives a more vigorous developer than an equal weight of potash or its equivalent in soda. The most marked property of pyrocatechin in comparison with pyrogallol and most of the other developers is its freedom from stain. In consequence, the concentration of the sulphite of soda may be largely reduced, which increases the speed, and has the further advantage that the development may be prolonged without danger of fogging or of obtaining veiled shadows. The solution of pyrocatechin seems, as far as I have noticed, to keep as well without the addition of sulphite, and since discolouration, are more marked in slow development, and slow development usually follows from under-exposure where more alkali is used, it seems to be more rational to put the sulphite with the tribasic phosphate. The amount of the latter given in the following formula is also small, for, since slow development is not accompanied by stain or fog, it is to be preferred, because a greater proportion of incorrectly exposed plates can be thereby saved.

I have tried the following formulæ on several dozen plates of all degrees of sensitiveness, both in the field and studio, with under-normal and over-exposures.

No. 1.

Pyrocatechin	5 grammes or 80 grains.
Water.....	250 c. c. or 10 ounces.

No. 2.

Tribasic sodium phosphate ..	25 grammes or 1 ounce avoird.
Sulphite crystals	10 grammes or 3 drachms.
Water	250 c. c. or 10 ounces.

For normal exposures take—

1 part No. 1 .. 1 part No. 2 .. 1 part water.

For slight over-exposures take—

2 parts No. 1 .. 1 part No. 2 ..

For more marked over exposures take—

2 parts No. 1 .. 1 part No. 2 .. $\frac{1}{10}$ -part of ten per cent. bromide solution.

For under exposures take—

1 part No. 1 .. 2 parts No. 2 .. 3 parts water
followed, if necessary, by more of No. 1 for density.

The normal developer has about the speed of pyro soda, and yields negatives with well covered lights, and clear shadows with plenty of detail, well suited to ordinary P.O.P.

The developer with bromide of above strength acts very slowly, so that an over-exposed plate, three to five times over-exposed, will not appear for a minute or two, and yet yield a normal negative. One should wait patiently until the image appears, and continue with the same developer unless it has an under-exposed or an over-exposed appearance. In the latter case add more bromide, in the former transfer to a normal developer, or add a small amount of a saturated solution of the tribasic phosphate (about 1 : 5). This procedure is to be recommended when the exposure is uncertain. Bromide has a very great effect in slowing the action, greater in proportion to the effect upon the character of the negative than with pyrogallol. It has, however, a sufficient effect upon the negative, more than with most of the other organic developers. The saturated tribasic phosphate solution neutralises this slowing, but at the same time also the good effect upon the result.

The developer for under-exposures also works very slowly, and is exceedingly effective in bringing out detail when so diluted that the development requires twenty minutes to half an hour. The resulting negatives are not too dense in the lights, and have clear shadows with good details; this procedure is to be recommended for flashlights which are usually harsh and somewhat under-exposed.

A more vigorous quick-working developer, yielding good, strong negatives from normal exposures, may be obtained by increasing the tribasic phosphate in No. 2 by 50 per cent., or even 100 per cent., the latter being approximately a saturated solution. This developer corresponds to the ordinary formula with phosphate and caustic soda.

The tone is a neutral black to a warm black. If the prolonged development of over-exposures results in a sepia black, the strength of the sulphite may be increased by adding ten grammes of sulphite crystals and a few drops of sulphuric acid to No. 1.

One used to a pyro-soda developer, who substitutes pyrocatechin for pyrogallol, will not find that he has the same old developer with the stain left out, but a new one the acquaintance of which must be made in due form. On this account, and also because the old pyro is still supreme in yielding negatives of beautiful gradation and harmony, it is not probable that "stainless pyro" will replace the old pyro amongst the old friends of the latter.

If pyrocatechin becomes popular, it will be because of its property of being at once very effective for under-exposures and controllable with bromide for over-exposures.

W. S. DAVENPORT.

PLASTIC PSYCHOLOGICAL SYNTHESES AT RUSSELL SQUARE.

A FEW years ago, when Mr. Rowland Briant showed some of his "astigmatographs" at a Society of Arts meeting, Sir William Abney, who presided, dismissed those photographic abortions to the oblivion from which they never emerged, with the feeling remark that they made him sick. He called the things *nauseographs*. But there is some soul of good even in an emetic, for it relieves the stomach of that part of its contents which owe their presence there to a perfunctory application of the laws of scientific dietetics. At least 300 of the 375 prints by the "new school of American photography" now to be seen at 66, Russell-square, have no such redeeming quality, for, by themselves, we fully believe that they would afflict one with permanent colic, if it were not corrected by the presence of a few singularly beautiful and interesting productions, the admiration and appreciation of which neutralises the unpleasant sensations caused by the larger number of the exhibits. All photographic exhibitions are mixtures in varying proportions of the good, the bad, and the indifferent; but to "the new school of American work," as defined by Mr. T. Holland Day, whose qualifications for his self-assumed task of selection and rejection have to be taken for granted, belongs the uncoveted distinction of including the repulsive, and the offensive.

Cluck! cluck!

A month ago, when writing of the so-called plastic psychological syntheses at the Photographic Salon, we gave a quotation from an American "appreciation" of Mr. Holland Day, written by Mr. Hartmann, whose portrait hangs at Russell-square, W.C. As Mr. Day apparently considers himself the master of the new American school, a

further extract from the writings of his obsequious disciple may serve to inform the British photographer what manner of man it is that has come among us to spread abroad the Cult of the Spoilt Print, and bearing aloft a banner with the strange device, "Behold, it is I."

To quote Hartmann :

"He (Mr. Day) has always lived the life of an aesthetic, who appears to all, at the first glance, as an extraordinary extravagant personality, one that excites immediate curiosity. Strange stories, both astonishing and ridiculous, are told about him, and he in no way objects to them. In serious dignity, he applies more of his imagination, for instance, to his mounting of prints than to his artistic productions themselves. To pose is a necessity to him, as it is only when he believes himself something out of the ordinary that he can accomplish good work, which is always an endeavour to realise something out of the ordinary. Many anecdotes are circulated about him. Once a stranger visited him, and, knocking at the door, heard a most cheerful 'come in,' but, entering, found to his great astonishment nobody present. He looked around everywhere, but could find no trace of Mr. Day; then suddenly he heard a clucking sound. he looked up and saw Mr. Day sitting on a shelf right under the ceiling, wrapped in an Oriental costume, smoking a water pipe! There exist also dozens of variations of the curious theme, how he made his 'Christ studies.' He left Boston with a whole troop of male and female models, accompanied by a waggon load of costumes, a wooden cross, and other paraphernalia, for some secluded country spot in the vicinity of the modern Athens. Out there he went at once to work, had the cross erected on the top of that hill, built a sepulchre, and prepared for a long stay. Then began the rehearsing of his company, and the sacred tragedy was played more than a hundred times on the top of that hill, while curious farmers on their waggons with their entire families, came from far and near to gaze at the strange spectacle. There is still some doubt in the profession whether he posed himself for the Saviour or not."

So now we have the essential part of the formula for the very newest kind of American photograph. You must believe yourself something out of the ordinary; sit under a shelf near the ceiling; smoke a water pipe; and make a "clucking" noise—which is what a brooding hen does.

It is such pitiful rubbish as this, seriously published in an American photographic paper some months ago, which makes us suspicious of the sincerity of some of these American photographers. Into their spoilt prints they read—or affect to read—qualities which a conveniently imaginative appreciator is also willing on the smallest provocation to perceive: but which are not apparent to a healthy-minded person with steady nerves and a clear vision. Who does not remember poor George du Maurier's scathing pictorial satire on the aesthetic craze of 20 years ago, of which the explanatory text was something like this: *HUSBAND* (fondling over teapot): "It is consummate; is it not?" *INTENSE WIFE*: "It is! Oh, Algernon, let us live up to it." Then that arch-humbug Postlethwaite who into a lily placed in a glass of water read so much that was utterly utter—to himself alone. Nor have we forgotten the impostor Grigsby, the art critic, who sustained a brief reputation by means of the flabby gush and oleaginous admiration which he flung at works of art. Postlethwaite and Grigsby seem to have revisited the glimpses of the moon and "broken out" in photography!

That curious production, the photo-faker, who, not having succeeded as a professional photographer, takes up the exploitation of "pictorial" photography as a matter of business, objects not unnaturally to the analysis of methods and motives in matters of the kind under review, for if he and what he says and does were understood he would be found out, and people would have no more of him. In the present case there are some i's to be dotted and t's to be crossed. Mr. Holland Day has come to this country to engage in business as a professional photographer. We are sure that in that capacity he will be heartily welcomed, and every one will wish him success. But we very much doubt if he will succeed by some of the methods he has chosen, and we are sure he does not deserve to. When by the acquiescence of the authorities of the Royal Photographic Society he was permitted to advertise himself and his work at Russell-square he, in our opinion, showed a very poor return for the courtesy extended to him by deliberately courting the risk of giving offence to any of the hundreds of visitors to whom, we believe, he and others sent tickets of invitation. A year or two ago some of Mr. Holland Day's sacred photographs with himself as the central Figure were exhibited and reproduced in this country, and the almost unanimous condemna-

tion with which they were met—clever though they were—should have warned him that a repetition of the offence was not desirable. It is to be regretted that he has ignored English feeling in this matter by showing at Russell-square a number of crucifixion subjects, the crowning objection to which lies in the fact that he himself poses before the camera as representing one whom so many millions of the earth's people revere as the Divine Founder of Christianity! If this were Mr. Day's first offence it would be open to us to hope that he had acted in ignorance, but as this is not the case we are constrained to say that it has been reserved for a photographer from Boston to be guilty of the most flagrant offence against good taste that has ever come under our notice. If this be the new school of American photography the less we, in this country, have of it and its professors the better.

Among the exhibits at Russell-square there are some by Mr. Yarnall Abbott; Miss Zaida Ben-Yusuf; Mr. A. D. Cook; Miss Sarah I. Eddy; Mr. S. H. Hollinger; Miss Frances B. Johnston; and Miss Weil, chiefly portraits which are good in the two cardinal respects of pictorial and photographic qualities. They comply with Constable's requirement that "a good picture should be seen at a glance." And without feeling ourselves "anything out of the ordinary," "smoking water pipes," or "making clucking noises" we can perceive much beauty and power in some of the work shown by Mrs. Kasebier and Mr. Day himself (whose "first person singular" portraits of some well-known English photographers are grotesque in their falsification of likeness and their frankly bad technique), but most of the productions of Mr. Eugene, Mr. Watts Lee, Mr. Steichen, Mr. Keiley, and their imitators we refuse to accept at any price. In occasional moments of lucidity they stop short at masking their meaning, and then perhaps, we behold in the "I" of those productions some effects which are intelligible if not convincing to others besides their producers. Such things as Keiley's "Study of Hair" (No! we cannot conscientiously repeat the London *gamin's* catch word, for the lady's hirsute adornment is not obvious), Eugene's "Madonna of the Vine"; Steichen's "Vampire" and "Apple-blossoms" certainly tax the imagination, and thus as pictorial puzzles are not without their uses. But if these and other things at Russell-square are put up for our appreciation, admiration, or comprehension, then Constable's glance requires to be lengthened from a second of time into more years than we care to live on this earth—especially with "clucking" photographers for our company.

To do our American friends justice, they show much taste and distinct originality in the mounting and framing—the ensemble, as it were—of their exhibits, and on that account the show is decidedly worth a visit. In the prints the capabilities of the gum and platinoglycerine processes for producing the "sort of things" which the very newest photographers regard as the "last word" in pictorial advance are very fully shown. To the very end of what it is or professes to be this show upsets all the old-fashioned ideals of the English photographer. The teachings of the new American school are frankly heterodox. Fake your negative or your print or both to the limit of your wishes and get a result as unlike the popular idea of what a photograph should be as possible. This is the philosophy of the new American school in a nutshell. But why should we weary the reader with a repetition of that "appreciation" of the Cult of the Spoilt Print which we wrote and printed on September 28th last?

There are still some more i's to be dotted and t's to be crossed. In the United States nearly every responsible photographic writer severely condemns the extreme things to which we have referred. Our brethren across the Atlantic style them "freaks." The wordy Hartmann deludes his neurotic dupes that these faked camera images are plastic psychological syntheses, and the authors of the things, at any rate, appear to believe him. We have a Hartmann this side, smitten just as badly with the curse of words, and whom we need not particularly specify. What holds good here in the matter of schools is duplicated in the States. Two or three "superior" persons make eccentric photographs; gather round them individuals similarly afflicted, and use their best endeavours to persuade the public to believe that outside their small circle of mutual admiration pictorial photography does not exist. To students and onlookers like ourselves who have no mission to boom pictorial photography as a business, the whole thing is funny to a degree. The episode of the three tailors of Tooley-street is a fool to it.

Now, let not the English student of the new American school be persuaded that the Russell-square exhibition is properly representa-

tive. It is not. Suppose a collection of the "British school" to be sent to the United States without including the best samples of their work by William Crooke, H. Walter Barnett, Fellows Wilson, Mendelssohn; Alice Hughes; the Speights; T. C. Turner, of Hull; Warneke, of Glasgow; Alfred Werner, and a dozen other first-rate portrait photographers whom we could name. This would be a perfect parallel to the case of the Russell-square display. The little coterie which calls itself the new school of American photography is so wrapped up with a sense of its own importance that it has clean forgotten such men as Dudley Hoyt, Pirie Macdonald, Strauss, Falk, Bremner, and scores of other masters of American photographic portraiture. Half a dozen portraits of Crooke's memorable Sheriff Comrie Thomson type, the like of which is also produced in America, would make the Russell-square display look what it largely is—though fortunately not entirely so—a travesty of photography.

But new or old, representative or the reverse, and with all its cleverness, its daring, its suggestiveness, its excellences and its failures, the Russell-square show will not in the least advance the revealed ambition of Mr. Day and his two or three friends to get photography ranked as a fine art. "You are beating the bars of your cage in vain," wrote one well-known art critic a few years ago. And that is a process which may be continued to the crack of doom without persuading universal exhibition executives, or painters, sculptors and composers, to say to poor little photography: "Cafe and be an Art!"

FOREIGN NEWS AND NOTES.

Improvement of Blue Prints.—In an article upon this subject, which appears in the *Photographisches Wochenblatt*, N. Grün recommends the use of peroxide of hydrogen for giving greater intensity of colour. A blue print, when it leaves the washing water, is much less intense than after it has been dried and exposed to air for twenty-four hours. This change, doubtless due to oxidation, may be accelerated by adding a few drops of peroxide of hydrogen to the washing water. It also has the advantage of not imparting a blue tinge to the whites, which usually follows the use of ferric salts and hydrochloric acid. Those who have to produce blue prints quickly should find the use of peroxide of hydrogen of some value, as the colour is of full intensity as soon as the print is dry. It will also be found useful when the sensitised paper is rather old and gives veiled prints. Sensitised paper that has turned greenish-blue should be considerably over-exposed until a decided image is visible. A little washing soda solution should be added to the washing water, but very sparing use should be made of it. Repeat the washing, if necessary, until the whites are clear. Give the prints a final wash in water, to which a small quantity of peroxide of hydrogen has been added, which will intensify them.

A Caution to Holders of German Patents.—H. and W. Putaky, of Berlin, give notice that the date for the payment of fees has been changed, and that it is now one day earlier. If, for instance, the patent is dated October 9, the annual fee falls due on October 8 following. If tendered on October 9, a fine of ten marks must be paid. The six weeks grace, during which fees may be paid subject to a fine, also expires one day sooner. Consequently, if the owner of a patent dated October 9 tenders his fee later than six weeks from October 8, he will find his patent void.

Indelible Ink.—We read in the *Photographische Chronik* that the government of the State of Massachusetts has found an ink of the following composition withstands washing and all kinds of atmospheric influence:—

Tannic acid	23·4 parts.
Crystallised gallic acid	7·7 "
Sulphate of iron	30 "
Dilute hydrochloric acid	25 "
Carbolic acid	1 to 2 "
Water	902·9 "

Mix thoroughly.

Reversal.—The *Moniteur de la Photographie* reprints an article from the *Photo-Revue*, by Louis Fuilla, concerning direct positives, in reply to the objection that they are the wrong way round when taken in the camera. He points out that a second positive may be obtained by a fresh exposure in the printing frame, by which means the correct position of right and left will be restored. He gives the following table as the result of numerous experiments, from which an idea may be obtained of the exposure that should be given:—

	EXPOSURE.			
	Very hard.	Hard.	Medium.	Thin.
	m. sec.	m. sec.	m. sec.	m. sec.
In sunlight	2	15	1	45
In shade out of doors ..	10	—	7	—
In a room, two metres from an open window } 25 — 20 — 17 — 15 —	25	—	20	—

He remarks that it is preferable to expose in the shade if the original is of medium density or thin, and that a green glass should be used if such exposures are made in sunlight for sake of speed. He also finds that, the more rapid the plate, the more satisfactory is the result. Unfortunately, the writer gives no indication of the speed of the plates used for compiling the table quoted above, and it will be seen that the exposures do not harmonise. The exposure indoors varies between 15 and 25 minutes, whilst in sunlight it ranges from 45 seconds to $2\frac{1}{4}$ minutes.

Preserving Cut Flowers.—The following hints, given by a reader of the *Photo-Revue*, M. G. Lefebvre, may be of service to those who are interested in the photography of flowers. Cut flowers should not be placed at once in a vase. They should first be lightly sprinkled with perfectly fresh water, and, when quite wet, placed in the vase filled with the following solution:—

Water	1000 grammes.
Curd soap	30 "
Chloride of sodium.....	3 "

Cut the soap into shreds and see that it is quite dissolved. Add a small pinch of borax to the solution. This is not absolutely necessary, but the writer finds that flowers of brilliant colour retain their brightness better when a small proportion of borax is added to the chloride of sodium. If the flowers are to be kept several days, they should be taken from the vase every morning, turned downwards, and the stalks washed under a stream of running water for about three minutes. Sprinkle them with water again as on the first day, and replace them in the vase. The soap and water should be changed every two or three days. The most delicate flowers may thus be kept for several days, and the writer has seen some that have remained three weeks in splendid condition.

Reduction of Negatives.—In the *Photographische Chronik* a communication is published from C. Mischewski, of the Photo-chemical Laboratory of the Technical High School, Berlin, concerning the action of cerium sulphate as a reducer. Sulphate and nitrate of cerium have been recommended by MM. Lumière and Seyewetz as reducers and they seem free from the disadvantages attending the use of ferricyanide of potassium and hyposulphite of soda. C. Mischewski's formula is as follows:—

Distilled water	100 c. c.
Sulphate of cerium	10 grammes.
Strongest sulphuric acid	4 c. c.

Dilute this stock solution with three times the quantity of water for use. The bath at this strength works with moderate rapidity, and the negative retains its blue-black colour. The solution does not deteriorate if kept in the dark. If the negative is very dense, the concentrated solution may be used, and it acts with such rapidity that the negative is reduced to printing density in a very short time. The concentrated solution appears to act more upon the high lights than does the usual ferricyanide bath.

The Dangers of Flashlight Photography.—It is with much regret that we learn that Mr. Ch. Gravier, an advocate of the

advantages of flashlight photography, has met with a serious accident. In the gardens of the Paris Exhibition there is an automatic machine for photographic purposes. As the apparatus is placed in an unfavourable position, a magnesium flashlight is used to supplement the exposure. M. Gravier sat for his photograph, and after the charge of magnesium had been used felt intense pain in the right eye. He complained to the operator, and recommended him to be more careful with other sitters. When the operator handed him the photograph, which was badly over-exposed, he explained that he was not a photographer. For three days M. Gravier could only read with pain. A yellow film then formed upon the eye and afterwards changed to a deep blue. Specialists state that M. Gravier is suffering from injury to the retina and that recovery is rare in such cases. We trust that M. Gravier, who is a sexagenarian, may, with care, regain his sight.

Reversed Negatives.—In a paper communicated by Professor Namias to the Congrès de Chimie appliquée et de Photographie, the following process is recommended for obtaining reversed negatives. After full exposure of the plate, which should have a very even film, develop with the following developer:—

Sulphite of soda	30 grammes.
Carbonate of potash	50 "
Glycerine	10 "
Bromide of potassium	1 grammme.
Water	1000 c. c.

The plate is left in the developer until those parts corresponding to the high lights of the negative are visible from the back. To obtain this effect it is necessary that the plate should remain at least half an hour in the bath. Slight fog is immaterial. Rinse the plate under the tap and immerse it in the following bath:—

Permanganate of potash	30 grammes.
Sulphuric acid (commercial)	20 c. c.
Water	1000 "

This bath dissolves the silver reduced by development and as soon as the operation is complete clear the image by immersion in a one per cent. bath of oxalic acid. This may be done by daylight. The plate should then be redeveloped. The following solution has been found most suitable:—

Metol	10 grammes.
Sulphite of soda	40 "
Caustic soda	5 "
Water	1000 c. c.

Wash and dry the negative, and if too dense reduce it with permanganate of potash, acidified with sulphuric acid.

A PRESIDENT'S HINTS.

[Notes of an Address by Mr. Thos. W. Robertson, Glasgow and West of Scotland Amateur Association.]

At the annual meeting of the Glasgow and West of Scotland Amateur Association, the new President, on taking the chair, said:—Another summer has passed away since last we met, a summer which, I hope, to all of you has been a prosperous one, and one in which you spent many pleasant hours with the camera. From a photographic point of view, the season has not altogether been everything that one could desire. The weather has been so uncertain that work with the camera suffered a great deal; but perhaps it is consoling to remember that it is often during such uncertain weather that some of our most beautiful effects are secured—effects of sunshine and shadow so dear to the heart of the artist, be he photographer or knight of the brush.

As a change from the cares and worries of our daily life, the practice of photography must ever remain a pleasant and most entertaining relaxation. Our hobby, also, is a means of leading us from many of those undesirable influences that surround our daily life, bringing us to have a fuller and deeper appreciation of all that is good and beautiful in this world. As an educative medium for young and old alike, I know of nothing better than photography.

Nowadays one cannot fail to notice the vast increase in the votaries of our art. Turn where you will by road, or rail, or steamer, the camera is always in evidence, from the pocket instrument to the lordly,

though cumbersome, 15 x 12. One naturally concludes that no matter what hobby may have lost favour with the public, amateur photography has certainly not suffered. As a science, it has advanced by leaps and bounds, improvement has followed improvement, until there seems little or nothing more to be achieved, so far at least as perfection of apparatus is concerned. What a contrast to the olden days, when one had to carry forth into the field, dark room, chemicals, glass plates, and all the necessary paraphernalia for the wet plate process!

At one time, and that at no very distant date, the amateur photographer was looked upon with feelings akin to amusement, and occasionally ridicule, and was generally put down as a cranky individual whose pastime, if not a nuisance, was, at least, harmless. Now all that is changed. The dark days are gone, and the amateur shines forth not only as an artist, but as a benefactor of all his professional fellow-workers. I use the word benefactor advisedly, for to him is due much of the improvement that has taken place in the manufacture of apparatus. In fact, the amateur has been the means of creating the demand for superior appliances the manufacturers have so fully met.

Perhaps the greatest change that has taken place in pictorial photography has been due to the advent of the hand camera. In a sense, it has revolutionised photography, and has almost knocked its big brother—the stand camera—out of the field. To the hand camera I think I may say we are largely indebted for the huge army of workers in photography. To it also are due many of the splendid illustrations that flood our weekly and monthly periodicals. It has been the means of recording numerous passing events of the day, events which crop up secured by any other means. During this year in the war across the seas we have had grand examples of the work done by this handy little instrument. In all our war journals is to be found an array of work of a very high order, which could never have been accomplished without the aid of the hand camera.

Then in our daily life, even in landscape work, results can be produced with the hand camera equal to those obtained with the stand instrument. No doubt a great deal of indifferent work is produced by the hand camera worker, largely owing to the want of experience on the part of the operator and to an improper choice of subject. With some their whole aim is the exposure of plates, firing them off at everything they come across regardless of time, light, or subject. No doubt the chief cause for this waste of material is the cheapness of the dry plate of to-day. There seems to be no cure for this disease, but it generally brings its own reward or punishment, as sooner or later the amateur of that type gets disheartened, and his camera goes upon the market.

Another point worthy of remark is that so many taking up photography for the first time start with instantaneous work, without having made a single time exposure. They begin at the wrong end of the alphabet, and thus make a fatal mistake. Every beginner should master the rudiments first, and, afterwards, if he will, try the classics. If this were done many a shilling would be saved, and much better work be done all round. Regarding the plates used by most hand camera workers, I cannot help saying that quite a large number go astray in selecting the most rapid they can find. If amateurs would only use a plate of medium rapidity they would have better results. There is greater ease in developing them, and less risk of fog, and, in general, fewer failures. In dull weather, or for special purposes, the fastest plates are useful; but I hope to show later in the session some snap-shots taken on slow plates, and when you see them I think you will agree with me that I have reason on my side.

Regarding developers, we are now surrounded with a host of these useful gentry, some strongly advocated, but none, in my opinion, equalling our good old, tried friend, pyro for negative work. For special work, some of the new developers are first-class, such as lantern slide work, bromide enlargements, &c. These have replaced the old ferrous oxalate developer, and done away with all its attendant mess and stains. There is one of the newer claimants I have found very useful for enlargement and bromide work, viz., ortol. It gives very fine black tones, and is very clean to handle, and at the same time economical.

Within the last winter or two there has sprung up with mushroom growth a host of silver bromo-chloride papers, popularly termed gas-light printing papers. These have, no doubt, been tried with varying success, and where warm tones were desired some charming results have been obtained in experienced hands. That they have come to stay I would not venture to predict.

In gelatino-chloride printing out papers we have also quite a host to choose from, but there is one objection to their use, that they require to be toned. I think I am safe in saying that gold toning is a process most amateurs abhor—the tone is so often anything but uniform, or the tone one most desires. Why, then, use a paper that requires toning, when in the beautiful carbon process there is the paper *par excellence* for artistic work? You are sure of having a uniform tone, you have greater speed, you have a wider range of colour, and you can transfer your picture to almost any grade of paper, so that your scope for artistic rendering is endless. The simplicity of the process should alone commend it to all workers, and nothing is more surprising than that it is not more universally used. Possibly many amateurs, when they read the working of the process for the first time, come to the too hasty conclusion that it is much too complicated and entails too much labour, but I am sure the labour entailed is not greater than that

demanded by P.O.P.—and the results—well, they are not to be compared.

In photography, as in all other kindred hobbies, there are branches or bypaths which lead one into some special type or class of work, such as the study of flowers, fruit, animals, birds, &c. Now, perhaps, amongst all the branches of photography that of mountain work is most neglected. Why this should be I cannot say, except that its practice is attended with some degree of physical exertion. Well, I can assure you that in mountain photography there is great scope for artistic rendering of Nature in her smiling or frowning moods; great scope for reproducing those passing charms sacred to the grand solitudes of the everlasting hills. For those who find a delight in the ever-varying beauties of cloudland, the mountains offer the finest field imaginable for photographic work. The subjects are, perhaps, a little difficult, but well worth any amount of labour, and to all sound of wind and limb no more delightful pastime could be recommended.

Besides mountain photography, there are other branches of our art that may appeal to those not inclined for such arduous work. To those scientifically inclined, photomicrography offers pleasant and instructive inducements, so that even in the winter months the camera need not be packed away, as is too often the case with many skilful amateurs.

EDINBURGH INDUSTRIAL EXHIBITION.

THERE has been much talk of educating the public to what is "good and true" in photography by means of exhibitions, but an exhibition such as we are now considering must have a greater influence on the mass of the public than any merely photographic show, because thousands go to see this exhibition who would never dream of going to see a photographic one pure and simple; and, once there, it is the photographic section that is the popular one; all the time of our visit it was surrounded by crowds of gazers, and we noticed quite a number of the exhibits sold; but, then, the producers of them did not ask £10 for them. The exhibits in the exhibition comprised 3,500, and the photographic section about 320, divided into no less than 34 classes, some of them, it is true, with only one exhibitor. We have before referred to the want of management; on the third day of the exhibition we could not get a prize list; they had, however, probably in reply to our suggestion of last year, prize tickets on the most of the frames, they had either been lost or withheld, probably the latter, as, although there was much good stuff, the judges' debate at times would be, Which is least bad? and to that one they would award the prize. There are two sets of classes, and duplicates in each class; one is for "amateurs," and has a section where you can enter any kind of print, the other section is reserved for carbon prints, but in these some classes were marked "open," so it was not an easy matter for intending exhibitors to know what was what; the other class was for those who had never won a first prize at this exhibition, and after that came "carbon" classes, without any special note as to who were eligible for them; as a consequence several professionals entered, and the management evidently felt the difficulty they had placed themselves in, for they added two professional classes.

The work all over was of a very mixed order, some very good work and some very poor work. Perhaps the gem of the whole exhibition was a little panel picture of a demure maiden by Miss Buchanan, Edinburgh. The picture was complete with no unnecessary accessories; the arrangement was pleasing, and the range of tone well kept. Altogether it was a picture that any one would be proud of, and only missed the "Evening News" special prize for best work in the class by not having the necessary coupon attached; it well deserved it. Miss McLauchlan, Edinburgh, has evidently a very good cat model, for the photograph of a cat on guard over a mouse trap with which she took first place in Class 34 was a delightful study of cat life. The multiplicity of classes was responsible for several duplicates being in the prize list. E. L. Brown (Edinburgh), Thomas A. Sands (Aston), and C. M. Wane (Edinburgh) were all very successful exhibitors. Mr. Brown has a good landscape in No. 614, although the clouds have an unnatural appearance. He has some good studies of Pomeranian dogs, and in 625 he has a good interior of first-rate technique. Mr. Sands has in 568 a good seashore piece; the distance is well suggested, and there is a fine feeling of atmosphere about the picture; the clouds are perhaps a little "streaky." In 575 he has a gem; seldom have we seen a better representation of "wind" than this girl on a wind-blown seawall. His study of pelicans in 601 is satisfactory, the quaintness of these birds being beautifully and variously portrayed. Mr. C. M. Wane, in 627, which gains one of the "Evening News" special prizes, has one of the best things in portraiture he has yet done. It is a beautifully rendered study of a little girl, natural in pose, with a slight similarity to Craig Annan's "Little Princess." His "swan" studies are much in evidence, and look as charming as ever. The manner in which he has again and again secured the traditional curve of the swan's neck can only be appreciated by those who have tried it, although the beauty of it is evident to all. There are a number of snow scenes, but in all there is a lack of gradation in the snow. The ex-

hibitors have yet apparently to learn that snow, as seen in a landscape, is not uniformly white, but rather a picture of fleeting lights and shadows, difficult enough to depict with the camera, but untruthfully rendered if represented in the print by a white mass. T. D. Shiells, Edinburgh, has a magnificent head of an old man in his 63¹, but it might have been improved if it had a little more breadth. In "Photos not classed," W. J. Byrne, Richmond, has two very fine portrait studies, and the surprise is that he did not get first place. The "first" picture is a mixed up photograph of a girl at a pump, but it is devoid of perspective, the whole picture being in one plane. A lovely flower study in this class is also unaccountably passed over. In both professional classes C. M. Wane takes first place, his swans being again in the ascendancy. The band of the Royal Marine Light Infantry was the attraction in the evenings, and as a result the Waverley Market, probably the largest hall in Scotland, was crowded nightly. Mr. Hutchison has accomplished much in the four years of this exhibition, but he can do yet better in the section in which we are interested if he will but take our hints to heart.

THE LATE LEON WARNERKE.

We are sorry to have to announce the death of Mr. Leon Warnerke at Geneva on October 7 in the 63rd year of his age. Although during the last two or three years Mr. Warnerke's participation in British photographic work was very slight, for nearly a quarter of a century his activity had been incessant. Hungarian by birth, he settled in England about 30 years ago, his profession being that of civil engineer. A taste for photography led him into the paths of experiment, and from a brief biography of him which was published in THE BRITISH JOURNAL OF PHOTOGRAPHY nearly 17 years ago, we learn that he first appeared prominently before the photographic public in 1875, when, at a meeting of the old South London Photographic Society, he read a communication on "Paper versus Glass," and exhibited and described his roller slides and sensitive collodion tissue. In 1876 he addressed the Photographic Society of Great Britain on the subject of "Investigations in Collodion Emulsion," in which he gave the results of a series of experiments on the relative values of different salts for emulsion purposes.

From that date forward the record of Mr. Warnerke's writings and papers would be a very lengthy one, for he did not confine himself to the societies and journals of this country, but made frequent appearances at photographic societies in Russia, Belgium, Germany, and France. At St. Petersburg 20 years ago he founded a photographic society and a photographic journal, and we believe that at one time he was commercially interested in dry-plate making in that city. In 1877 he was awarded the prize offered by the Photographic Association of Belgium for the best dry process, and in 1881 the Progress Medal of the Photographic Society of Great Britain was conferred upon him. Until a year ago he was a member of the Society's Council, and one of its most active supporters.

One branch of work brought him very prominently before photographers—actinometry and sensitometry. The Warnerke Actinometer was based upon the employment of a phosphorescent tablet, upon which to record the impress of the light's action, whilst the well-known sensitometer, which bears—or rather bore—his name, also utilised the same principle, and was for a long time the recognised and, indeed the only, standard of speed measurement for dry plates. Until comparatively recently most, if not all, dry plate-makers indicated the speeds of their plates by readings obtained on the Warnerke sensitometer. We believe that to Mr. Warnerke was due the credit of the establishment of the lens standards of the Photographic Society of Great Britain, a committee having been appointed by the Society at his suggestion to take the matter into consideration. He was a constant attendant at the various Photographic Congresses, and it may, in brief, be said of him that British photography is distinctly the richer by the close touch which he served to establish and maintain between photographic progress in this country and abroad.

In more recent years, we remember the very exhaustive account he gave of photographic educational institutions in Berlin, Vienna, and other Continental cities. It was Mr. Warnerke who introduced the well-known optician, Mr. C. P. Goerz, to a meeting of the Photographic Society, when the double anastigmat lens was first exhibited in this country, and to him that English photographers were indebted for sustaining interest in the Lippmann process of interference colour-photography, Messrs. Lumière's remarkable results being shown by him at a Society of Arts meeting in the year 1893.

To assign a limit to Mr. Warnerke's photographic enthusiasm and unselfishness would be a hard matter. Personally, of a most genial and communicative disposition, his great store of photographic knowledge and experience were always freely offered to all those who sought them. We had the pleasure of the deceased gentleman's acquaintance for about ten years, and we received much encouraging help and information from him. We cannot close this short and imperfect sketch of his useful career without appending the conviction that Fate acted cruelly and unjustly to him in the last days of his life, and that he was the innocent victim of circumstances which hastened his end.

ARTISTIC MOUNTING AND FRAMING.

BEFORE the members of the Leeds Camera Club on Wednesday evening, Oct. 10, Mr. A. Keighley (Bradford Photographic Society) delivered a lecture, one of the series of the Yorkshire Photographic Union.

He said it is somewhat strange that in these days when so much is thought, said, and written about the making of pictures, composition, light and shade, that so little attention appeared to be given in the photographic journals or those devoted to other arts, of the mounting or setting in which those pictures appeared. A picture is to its mounting or frame just what a jewel is to its setting, or a flower to the leaves with which it is associated; either of them is incomplete without the other.

It is very strange that this subject of framing never seems to be brought before the students in our Academies on Art, so important a matter seemed to have been altogether neglected, and still stranger that a writer so voluminous and versatile and comprehensive as Ruskin seemed never to have given any attention to this subject in any of his writings.

"The literature on the subject is very scanty indeed, and to give you some idea I took the trouble to go through the whole of the volumes of the "Studio," which covers a very wide field, but I was unable to find a single article with regard to mounts and frames. The reason for this neglect seemed to him to be the limitation and the strict regulations which are imposed on artists at Exhibitions.

The authorities at the Royal Academy and the other principal shows always insist that the pictures, whether oil or water colour, shall be surrounded with a gilt frame for the sake of uniformity, and there is no room left for the exercise of individual taste.

It is a well-known fact amongst artists that the gilt frame is out of harmony with the picture, and artists wishing to exhibit must comply with the rule; and, this rule being firmly established, it followed as a matter of course, that a gilt frame is necessary for any work of art in colour, and the general public have come to accept the gilt frame as the correct thing, and it is only in this way one can understand why artists have given so little attention to the subject.

What is the fundamental principle of a mount? In the first place, to support and project the picture; in the second, to isolate it from its surroundings; and, in the third, to harmonise and enhance its general effect. It seemed to him that generally people hung their walls with pictures not to see the pictures themselves, but simply to decorate the walls.

It is altogether out of my province to speak of the mechanical part of the subject, but to draw attention to the principles which should govern the selection of mounts and frames.

Of what use are mounts? Why are oil paintings framed close up and water colours framed with a considerable mount between the picture and the frame? The reason is that oil paintings were generally large in size, and water colours generally small, and painted in delicate and transparent colours, and improved by a mount placed between the picture and the frame.

Photographs of large size and strong and decided in appearance framed close up in a somewhat heavy frame suited the picture best, and a mount is more suitable if small and delicate in appearance, but no hard and fast rule could be laid down. Mounts in which diagonal lines run from corner to corner emphasising the weak points in the centre of the picture are to be avoided, a little more top or bottom or side to side being much better.

As to tone, by which he did not mean colour, but simply the question of lightness or darkness, the law of contrast applied, a very light print should be surrounded with a white mount. Speaking generally, an absolutely white or black mount should rarely be used, and only in extreme cases; rather than absolutely white, it is better to have a tinted mount, and dark mounts should be used where darker tones prevail, and medium-coloured mounts where a fairly even balance between the lights and shades occurred.

The frames of old English masters struck one by the poverty of design which most of them exhibited; and, turning to the present day pictures, the same feeling applied in regard to many of them. If it was essential that pictures in an Exhibition should be all framed alike, it might be allowed that gilt is as suitable as any other colour, but our opinion, given with diffidence, is that the glare and glitter were sometimes very much out of harmony, and prejudicial to the general effect.

Photographers were not bound in any of their Exhibitions by hard and fast rules, and therefore they got great diversity of style, from heavy cabinet work to very slight frames, but, on the whole, this diversity is better than uniformity. It is so much the custom amongst photographers to follow the prevailing fashion: some amateur sees a masterpiece surrounded with a heavy frame, and so he proceeds to his own frame maker and orders his picture in similar style, the result being that his picture is killed by unsuitable framing."

In conclusion, the lecturer pointed out that frames should be chosen to suit the picture in colour, size, and texture, and might perhaps have details emblematic of the subject of the picture. It should not be unduly eccentric, or divert undue attention from the picture itself: and any part of it carved should be diminished in conspicuity so as not to detract from the main purpose of the whole.

THE LATE THOMAS FALL.

We very much regret to announce the death of Mr. Thomas Fall, photographer, of Baker-street, Finchley, and Bayswater, which took place on Saturday, October 20, at his home, Wensley, Arkwright-road, Hampstead, N.W. The cause of death was heart failure. Mr. Fall had just entered his 67th year. He leaves a widow and several sons and daughters, the former including the Rev. J. W. Fall (of the Church Pastoral Aid Society), Mr. Geo. F. Fall (of the firm of Cooper and Balie, solicitors).

Mr. H. Snowden Ward, who was the last person outside the immediate family and attendants to converse with Mr. Fall, sends us the following notes:—

"The fatal illness was undoubtedly the result of long-continued over-work, and commenced several months ago, while Mr. Fall was taking in Brighton a much-needed and too-long postponed rest. While walking in the street with his daughter he was suddenly seized with heart failure, was taken into the nearest house, and a doctor at once summoned, who for an hour found it impossible to restore animation. In spite of the shock of such a seizure, a few days saw Mr. Fall at work again, rather than disappoint a wedding party which he had undertaken to photograph personally. The exertion proved too great, another heart stoppage ensued, and only by the greatest care was it possible to take the patient to his home, where for months there was a continuous and almost hopeless struggle between life and death. At length, about the end of September, there was a considerable change for the better. Though very much shattered by the long illness, Mr. Fall began to take fresh interest in his old pursuits, about which he had scarcely spoken for some months. His first act was to ask his son to offer a set of lantern slides with notes which he intended to prepare for one of the Royal Photographic Society's lantern evenings. A day or two later he asked for his file of THE BRITISH JOURNAL OF PHOTOGRAPHY, and had his nurse read to him those items of news which had occurred during his illness. Collections of the current works from his studios at Finchley and Baker-street were obtained, and the quality of the work gave him much pleasure; and a day or two thereafter he asked that I should call to tell him "all the news of photography."

"On October 10, when I was able to spend an hour with him, his mind and memory were wonderfully keen and clear in spite of great weakness. He inquired by name for many of his photographic friends, and asked the present whereabouts of some whom he had not seen for many years. His greatest pleasure seemed to be in remembering the gratitude of so many of the people whom he had been able to help, photographically or financially, and in particular he mentioned a young lady who had recently left England for Chicago, and a man, helped many years ago, who was now, or recently, in Yarmouth.

"For another week Mr. Fall seemed steadily gaining strength, but on the 17th there was a relapse, and after two days of pain he passed away peacefully in his sleep in the early morning of October 20.

"Probably no man was more constantly, cheerfully, and secretly busied in helping others connected with photography. His time, his money, and his wide knowledge were ever at the service of those who were in doubt or difficulty, and I do not think that any photographer has an idea of the noble extent of this generosity. Like Traill Taylor, like Richard Keene, he had a history of beneficence and helpfulness quite apart from his life that was known to all of us. Like them, he leaves a great gap in the photographic ranks which we have no one to entirely fill.

"For many years, and particularly during the time that I was Secretary of the Photographers' Benevolent Association, I have been sending to Mr. Fall a steady stream of photographers who wanted help, who wanted situations, who wanted advice or suggestion, and never have I known him lacking in sympathy, interest, and courtesy, even to the most broken-down of unfortunates. It is because I have thus had special opportunity of knowing this beautiful side of his character that I have asked the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY to allow me to write these lines."

The late Mr. Fall was born at Leyburn, in North Yorkshire. He was apprenticed to lithographic printing, but in his early manhood took up photography, first as a travelling worker, and afterwards built a studio in Bedale. On coming to London his first engagement was with the (then) new firm of Elliott and Fry. For many years he enjoyed a wide reputation for portraiture, being especially happy with children, and latterly he devoted himself to animal photography with great success.

To Mr. Snowden Ward's admirable tribute to the late Mr. Fall it is only necessary for us to add a few words. We had the pleasure of Mr. Fall's acquaintance for a considerable period, and on several occasions we were the channel by which he conveyed his unostentatious help to his less fortunate brethren. We are sure that his death will be widely deplored, and that general sympathy will be felt for his family in their loss.

PHOTOGRAPHIC EXHIBITION AT ROTHERHAM.

UNDER the auspices of the Rotherham Photographic Society, a very successful Exhibition was held in the Rotherham Drill Hall on Wednesday, Thursday, Friday, and Saturday, October 17, 18, 19, and 20. Although it was the eleventh annual venture of the organisation, it was the first at which there were competitive classes. Mr. C. B. Keene, F.R.P.S., and Mr. T. A. Scotton, both of Derby, kindly undertook the work of judging, and their awards were as under:—

OPEN CLASSES.

A. Photographs, any subject (previously medalled): Silver gilt medal, John Leslie Shawcross (Blackburn); silver medal, Sparham Camp (Sheffield); bronze medal, Greystone Bird (Bath).

B. Photographs, any subject (not previously medalled): Silver medal, Evelyn Boden, F.R.P.S. (Derby); bronze medal, J. H. Lygo (Sheffield); certificate, Greystone Bird (Bath).

C. Lantern Slides (sets of four). Equal bronze medals, Greystone Bird (Bath), Edgar R. Bull (London); G. Cleland (Edinburgh).

MEMBERS' CLASSES.

D. Photographs, any subject: Silver medal, J. C. Cox; bronze medal, withheld; certificate, A. S. Lyth.

E. Lantern Slides (sets of six): Silver medal, J. C. Cox; bronze medal, H. C. Hemmingway; certificate, A. S. Lyth.

F. Society's Excursion Work in 1900 (four prints): President's silver medal, H. C. Hemmingway; bronze medal, J. C. Cox; certificate, A. S. Lyth.

The A Class was not a large one. Mr. Shawcross scored with "Head of an Old Man" (sepia platinotype). Mr. Sparham Camp's picture was "Norwich Cathedral" (platinotype), and Mr. Greystone Bird's the well-known "Good-Night" (matt. solio). The B Class was unusually strong and representative, the entries numbering 54. Miss Evelyn Boden's position was obtained with "Head of an Old Man" (platinotype), Mr. J. H. Lygo's with "Gloucester Cathedral Cloister" (carbon), and Mr. Greystone Bird's with "Overhauling the Nets" (toned bromide). Lantern slides attracted 10 competitors, and the judge made three equal awards. Mr. Greystone Bird's winning slide was "Launching the Lifeboat," Mr. Edgar Bull's "Crypt Wells," and Mr. Cleland's "Waiting." The Members' Section was disappointing, especially in the D Class. Mr. Cox's "Art Critics" stood easily first. Lantern slides did not show the ability of the members to the best advantage. Mr. Cox again scored with "Glory Hole, Lincoln," Mr. Hemmingway being placed next with "Window, Wingfield Manor." Mr. Lyth was close up with "Lady Chapel, Gloucester Cathedral." There was interesting rivalry for the President's medal in the F Class. Mr. Hemmingway's best work were two Lincoln Minster views, and the "Little Shambles, York." "St. William's College, York," was the best of Mr. Cox's series. Mr. Lyth's were an even lot. Turning to the members' non-competitive exhibits, there were several especially noticeable, including the Gargoyles and other architectural curiosities by Mr. J. Leadbeater, as well as the same gentleman's "bits" found in the lake district; and Miss Mary Crossley's landscapes, with figures. Amongst the contributions of invited exhibitors were six enlargements of war snap-shots by Lord Scarborough, several characteristic works by Mr. Alex Keighley, F.R.P.S., and "An Old Stairway," by Mr. C. Barrow Keene, F.R.P.S., R. and J. Beck, Ltd., Kodak, Ltd., Messrs. Wellington and Ward (an enlarged copy of "The Curfew Hour"), and others gave their aid. The opening ceremony on the Wednesday afternoon was performed by Mr. J. S. Fullerton, J.P., M.F.H. Dr. Baldwin (President) occupied the chair. The large company included the Mayor and Mayoress, Mr. W. H. Holland, M.P., and Mrs. Holland, and Mr. G. W. Chambers, D.L. Each evening there were lantern shows, music by the Eastwood Orchestral Band, and other attractions.

THE DARK ROOM.

Most amateur and many professional photographers in a small way of business find it a great hardship, or at the least very inconvenient, to keep a room especially as a dark room, and where they do keep a special room it is often little more than a cupboard, dark enough, it is true, but stuffy and ill-ventilated, what small quantity of air it may contain at first soon being consumed by the lamp, so that the place is very hot and unhealthy to work in, besides being detrimental to the plates, and, in addition, there is practically no room to move.

If the room could be used to store plates, papers, and chemicals, and also be adapted for developing, printing, toning, and fixing, many of these people would be able to keep a room, and, fortunately, this can be done with very little trouble and expense. A light wooden frame should be made in the style of the following sketch.

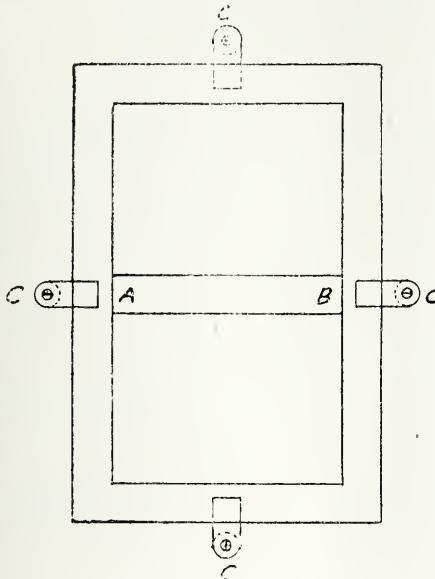
This should just cover the window frame, and be fastened either with buttons on each of the four sides, or perhaps, better still, a little ledge may be fastened on to the wall, either at the top or bottom of the window, for the above frame to fit into, and the other three sides

fastened with buttons. The frame may be covered with red twill, or canvas can be fastened to the frame, and red paper pasted on this, whichever is most convenient.

To ensure that no light enters between the frame and the wall, a layer of thin felt should be fastened to the frame on the side nearest the wall, and, if the buttons are made to press this tightly against the wall, no light will enter.

The frame should be made of deal, and unless the window is a very large one, the sides need not be more than half an inch in thickness and one and a half inches wide. In the case of a very large window, it might be necessary to have a rib across the middle of the frame to strengthen it, as at A B, but this is not usually necessary.

With this frame the room may be used for all purposes, and a great deal of time may be saved, to say nothing of the illuminants, when daylight is available, by taking the frame down from the window, an



operation which may be accomplished in a few seconds, and making all preparations, &c., that can be done by daylight, instead of having to grope about in the dark or use artificial illuminants. It would be necessary to have a small cupboard to keep plates and other materials which would be affected by daylight, or any but a red light, and to get into the habit of putting these articles away before admitting daylight.

This arrangement may be found useful by those photographers who are not necessarily obliged to keep one room for all purposes, as many operations in photography can be conducted much better by daylight than by the aid of artificial light.

The centres of the buttons (c c c c) may be the ordinary brass or iron screws such as are generally used for wood, these answering the purpose just as well as anything more elaborate, and a great advantage with them is the fact that they are easily adjustable, besides being economical and readily obtainable.

C. T. SUTTON.

[We have for years used such an arrangement as that described by Mr. Sutton.—Eds.]

A NOTE ON POISONS USED IN PHOTOGRAPHY.

PHOTOGRAPHY, like all sciences allied to chemistry, often requires the use of poisonous materials, and, consequently, all who practise it should know when they are dealing with a poison, and how to use it with the least risk to themselves. A great many persons look upon a poison simply as a chemical which, when swallowed, is likely to cause death; but really the word covers a far larger class of reagents than this. A poison, using the word in its proper sense, is a compound which, when introduced into the system, either through the digestive organs, the skin, or the lungs, will cause ill or even fatal effects to the individual. Looking at it in the light of the above definition, we find that the poisons used in photography are by no means few.

In view of this fact it is well for every photographer to possess the necessary knowledge, so that, like the chemist, when he feels any ill effects at all resembling the symptoms of poisoning, or finds some one else exhibiting these symptoms, he can at once pick out the chemical which may have caused the harm, and then immediately proceed to neutralise its action on his system. It is of the greatest importance in cases of poisoning to do something immediately, for the action of the substance is going on, and the sooner it can be stopped the less damage there will be to make good, and the less chance of serious effects following. Consequently, it is as well for every photographer to know what to do at once, and not to be in a very vague state of mind as to what is best to be done, or having to consult books or papers which he cannot always find when they are wanted.

A great number of the poisonous chemicals used in the dark room can be divided under two heads, acid poisons and alkaline poisons. Now, every one with the slightest smattering of chemistry knows that acids and alkalies neutralise one another; that is, if an acid is acting upon any substance it can at once be stopped by applying an alkali, the compound then formed being almost always an inert one. Thus, to take a homely example, suppose you spill some nitric acid on your coat-sleeve. The acid at once begins eating away the fibres of the wool; but, if you immediately apply a drop of ammonia solution, which is a powerful alkali, the action of the acid is stopped, and no harm results to your coat. The nitric acid is forced to confine its attention to the ammonia, and forms with it a harmless chemical in the fibres of the woollen cloth. You can, therefore, easily understand that if any accidents happen with an acid, an alkali will generally stop any harm being done, and, in the same way, if you get an alkali causing damage, it should at once be stopped by the application of a weak acid. I would point out that the acid should be weak; in fact, whatever the antidote, it should not be applied too strong, or the remedy may be worse than the disease. In the case of an alkali, it is not so important as with an acid. The latter should either be a weak one, or should be diluted before application.

Following up this rule, let us see the best way to deal with some of the cases of internal poisoning likely to arise in the dark room of the photographer. Taking the acids first, we find that he often uses hydrochloric, nitric, sulphuric, oxalic, and pyrogallic acids. Now, suppose we have someone who has inadvertently swallowed a dose of one of these acids. At once give him a glass of magnesia or chalk and water, or, failing this, you can even scrape a little plaster off the walls or ceiling, and stir this up in water and let him drink it. This will at once change the acid into a harmless salt of magnesium or calcium. In the case of our old friend, pyro, it can be removed from the stomach by the aid of an emetic. The weaker acids, citric and tartaric, are not so dangerous. If, on the other hand, an alkali has been swallowed, its action must be stopped by drinking doses of a weak acid, such as vinegar or lemon juice.

There are several chemicals used by the photographer which cannot, however, be classed under these heads, and which include some of the most deadly poisons. Cyanide of potassium, which has, happily, been nearly supplanted by hyposulphite of soda, is a most deadly poison, and, unfortunately, one of its symptoms often is the loss of power to swallow. It behoves you, therefore, to be extremely careful when dealing with this salt. Another deadly poison is corrosive sublimate or mercuric chloride, used in intensification, and it should be used with great care. If by chance you should happen to swallow a few drops of the intensifier, you should at once follow it up with the white of an egg, or drink plenty of milk, barley water, or arrowroot.

Nitrate of silver, being one of the few soluble salts of the metal silver, will, if unfortunately you should swallow any of it, be absorbed into the system with injurious effects; but, if you take a strong dose of common salt dissolved in water, you will turn it into the insoluble silver chloride, which can then be expelled by the action of an emetic.

For an emetic you may try :

- (1) Tickling the back of the throat.
- (2) Frequent doses of warm water.
- (3) A tablespoonful of salt dissolved in a tumbler of warm water

A very rough-and-ready but a very sure emetic is to take one or two blank cartridges, and mix their contents with warm water. This is very prompt in its action. The chemist will also supply two or three emetics which are best administered under his direction. For instance, there is sulphate of zinc, ipecacuanha, and others.

So much for the internal poisons. Now let us turn our attention to the substances which cause harm to the skin. The strong acids if allowed to act on the hands or any other part of the body will have very harmful effects, but their action can soon be stopped by the application of an alkali, as stated above. Ordinary washing soda is always handy and is a very good one. Those of my readers who have learnt chemistry will also know that soap is made of a fat and an alkali. If, therefore, you should get any acid on your hands, it is a very good thing to wash them well with soap and water, the alkali in the soap at once neutralising any acid present. This treatment will be found especially useful in the case of a cut, into which a drop of acid may have trickled.

Weak hydrochloric or a solution of citric acid is very useful for taking out pyro stains on the skin, but the hydrochloric should be well diluted, and even then should not be used where there are any cuts or sores.

It is surprising to see how some workers will persist in dipping their fingers into the various solutions. Apart from the great risk of contaminating the various baths, there is also the danger of getting corrosive chemicals into any cuts or abrasions you may have. All this dabbling is quite unnecessary. The plate can easily be lifted with a match or a slip of wood or a plate-lifter, and partially drained before you need handle it. The intensifying bath is one, for instance, into which the fingers ought never to be dipped. You are never quite certain whether your fingers are absolutely free from cuts, scratches, or wounds of some sort or other, through which this highly poisonous chemical can get, and therefore it is safest not to dip your fingers in at all.

Poisons are best kept in easily distinguished bottles of some peculiar shape or form, so that, even if we do not see which bottle we are handling, we know by the touch that it contains a poison. They should also be kept locked up if possible, so as not to be accessible to the uninitiated, and, in conclusion, I would particularly point out that on

no account should poisons and such things as medicines be kept on the same shelf or in the same cupboard. Many a death has been caused by taking up the wrong bottle.

ALEX. SNAID.

THE NEW BOROUGH COUNCILS.

ON November 1 the Councils of the newly created metropolitan Boroughs will be elected, and on November 9, having selected their Mayors and Aldermen, they will come into office. Whether the changes which will thus take place in the local government of London will conduce to the ultimate benefit of the long-suffering ratepayers remains to be seen; but there are certain directions in which the process of alteration may be of advantage to photographers from a business point of view.

A large number of existing local authorities will be abolished—district boards, vestries, trustees, and commissioners for the administration of various Acts of Parliament will, within the next fortnight, hold their final meetings. They comprise a great many gentlemen who have for a considerable period identified themselves with parochial affairs, and photographers may find it worth while to suggest to them that photographic records should be made of their last gatherings, or that the outgoing ediles should be photographed, say, on the steps of the town hall, or at some similar place. The officers of the vestries, &c., who have worked together for many years, would also probably like to be included in a group, before the places which have known them so long know them no more. There are other opportunities of this kind which will occur to the man who is on the look-out for work.

In making arrangements for this class of business, it would, perhaps, be best, in the first place, at all events, to seek a personal interview with the Chairman, or some prominent official, rather than to make the proposal in writing.

HENRY EVERETT, F.I.S.

FARRELL AND BENTZ'S PROCESS OF PHOTOGRAPHY ON SILK.

[Patent No. 17,375 of 1899.]

THE invention refers to improvements relating to the production of photographs upon silk fabrics. Silk is immersed in a dilute solution of nitrous acid with the addition of hydrochloric acid, sulphuric, or other suitable acid, for about twelve hours at the ordinary temperature, or for a shorter period at a sufficiently high temperature, the operation being conducted in the dark.

The silk thus treated becomes bright yellow in colour, being converted, it would appear, into a diazo compound (chloride, sulphate, or other compound corresponding with the acid employed). The silk is then rinsed in water and dried in the dark. We find that the silk thus prepared is very sensitive to light, a few seconds in direct sunlight, or a few minutes in diffused sunlight, sufficing to change the bright yellow colour to a very pale buff. Before exposure to light the silk coloured yellow in the manner above described possesses the property of combining with phenols, such as phenol, resorcinol, alpha-naphthol, beta-naphthol, and their sulpho and carboxy derivatives in alkaline solutions, and with aromatic amido compounds, aniline, meta-phenylene diamine, alpha-naphtylamine, beta-naphtylamine, &c., in acid solutions, forming coloured compounds; after exposure to light the silk which has been treated in the manner described with nitrous acid loses this property, the yellow silk compound becoming chemically changed by the action of the light. We find that silk treated with nitrous acid according to the process above stated, after being placed under a photographic positive, and thus exposed to light, when it is treated with a phenol in alkaline solution or an aromatic amido compound in acid solution, gives a photograph similar to that on the plates under which the silk has been exposed, that is to say, a positive print of the picture on the positive is obtained. In the same way exposure under a photographic negative we find produces a negative print of the picture upon the silk. The colours produced by development as above described may be modified by after-treatment with metallic salts. For example, development with beta-naphthol in alkaline solution gives a bright red shade, which when treated with solutions of cobalt salts changes to a maroon shade. Again, development with resorcinol in alkaline solutions gives a bright golden yellow shade, which when treated with iron compounds changes to a deep brown or olive.

Modified shades are also produced by treating with nickel, chromium, copper, and many other salts. The modified colours thus obtained are in general extremely fast.

The colours obtained by development with aromatic amido compounds, when treated with nitrous acid for a short time and subsequently developed with phenols, naphthol, &c., in alkaline solution, or aromatic amido compounds in acid solution, give new colour compounds which again can be further modified by treatment with certain metallic salts. For example, the colour obtained by the development of the treated silk with alpha-naphtylamine in hydrochloric acid solution is a golden yellow. This when it is acted upon by nitrous acid and then treated with sodium amido naphthol disulphonate (1:8:3:6) gives a greenish slate or what may be termed a greenish-blue colour, or when it is acted

upon by nitrous acid, and then treated with beta-naphthol in alkaline solution, it gives a purple colour. This latter on treatment with an iron salt, for instance ferrous sulphate, changes to an almost black colour.

When the silk which has been acted upon as described with nitrous acid is exposed to light, it does not pass directly from what we assume to be the state of a diazo compound to the state of a compound which no longer possesses affinity for phenols or amido compounds, but it goes through an intermediate stage, a nitroso compound we assume being formed.

This intermediate compound is obtained by exposing to light the yellow-coloured silk compound described for a much shorter time than is necessary to render it chemically inactive with phenols and amido compounds.

When silk thus exposed for a very short time to sunlight is placed in alkaline solution (caustic soda, potash, ammonia, &c.) a brown colour is produced. As what we assume to be the diazo compound of silk does not change colour very much under the action of the alkalies, this property can be utilised for producing positive prints from photographic negatives. Thus we expose the yellow-coloured silk compound obtained by treating silk with nitrous acid in the manner described, under a negative for a sufficient length of time to bring the yellow silk compound in the parts where the light has access to the intermediate (or nitroso) stage, then we treat with an alkali the resulting compound of silk, and we obtain a dark brown positive print on a yellow ground.

We utilise the same property in printing from photographic positives in the following way: We expose the silk treated with nitrous acid in the manner described under a photographic positive, the compound in the exposed places on the treated silk (that is where the sunlight has penetrated) becoming changed into an inactive compound, while the unexposed portions of the silk (that is where the sunlight has not had access) are still in a chemically active state. We then remove the photographic positive and we expose the whole surface of the silk to light for a short time; the inactive parts remain unchanged, but the active portions are changed into the above-mentioned intermediate compound which we then convert into the brown-coloured compound by the action of an alkali as before stated.

The essential feature of the invention consists in the treatment of silk or fabric with the diluted solution of nitrous acid with the addition of hydrochloric acid, sulphuric acid, or other suitable acid, the operation being conducted in the absence of light for the purpose of rendering the silk sensitive to light.

GLIESECKE'S IMPROVEMENTS IN HALF-TONE BLOCK MAKING.

[Patent No. 16,137 of 1899.]

THE object of the invention is to provide means by which half-tone plates of any size and of any grain size can be produced by using only one and the same standard screen.

"I attain these objects," says Herr Giesecke, "by projecting (instead of copying) the standard screen on the sensitive surface, and thereby enlarging or reducing, as the case may be, the width of its net in the proportion desired, and at the same time substituting for the given original to be reproduced a negative (or a diapositive) taken therefrom on a suitably enlarged or reduced scale."

"I place my standard screen out of the camera at a point between the lens and the source of light, and I adjust the screen with respect to the sensitive camera plate so as to obtain on the latter a projection of the screen net in full sharpness and of the width desired."

"Having thus fixed the place of my screen, I take a negative from the original to be reproduced, the scale of this negative being so calculated that its projection on the sensitive camera plate will appear in the size intended for the half-tone, if the said negative is placed in suitable proximity of the screen adjusted as heretofore described. In order to easily have the scale needed for the negative, a tabulated statement may be made use of, containing once for all the several cases which may arise. The said negative (or, if needed, a diapositive taken therefrom by copying the same) is to be used in my invention instead of the original given."

"Having again adjusted my screen to its place as described, I now place the above negative (or diapositive) in proximity of the screen at the point for which its size has been calculated (this point being preferably chosen between the screen and the source of light, or, in other words, beyond the screen with respect to the camera). The photograph is then taken as usual, and a negative thus will be obtained on the sensitive camera plate corresponding to the size required, and provided with a net of the width desired."

"In the case of half-tone plates being to be produced to correspond at the same proportion, as to their size and the size of density of their grain, to the size of the screen and the width of its net, the use of a separate screen can be dispensed with, and the line-ruled negative (or diapositive) can be made use of. To this purpose, I adjust my standard screen as heretofore described, calculating, however, the scale of the negative (or diapositive), so that it will appear on the sensitive plate in the size required, if substituted for the screen in its adjusted position. The negative (or diapositive) then being taken on the said scale, the

standard screen is copied on the same, and a photograph taken from the line-ruled negative (or diapositive).

"By using suitable blinds the character of the screen net projected on the sensitive plate can be differently varied."

"In order to finally obtain the well-known half-tone plate for typographic printing, the negative on the sensitive plate is copied on a metal plate, and the latter etched as usual."

"Another kind of half-tone plate, say for lithographic printing, can be obtained by transferring the picture from the sensitive camera plate to a stone or a zinc plate, the said stone or zinc plate then being prepared as usual in lithography. By printing therefrom, half-tone lithographs are obtained showing fully the character of typographic prints."

Studio Gossip.

PERFUMED Calcium Carbide.—A contemporary states that a Dordrecht firm is bringing out perfumed calcium carbide, which is a step in advance even of odourless carbide, just as that is an improvement on the ordinary or evil-smelling variety. This perfumed carbide smells of thyme, and would seem to have been soaked in the essential oil of that plant. The acetylene made from the carbide has the same agreeable odour, and its illuminating power is increased, if anything. The perfumed carbide has the further advantage that it is less hygroscopic than the baser sort, and will, therefore, keep much better.

FIGURES in Lantern Slides.—A correspondent of the "English Mechanic" writes: "Returning from the Exhibition, I was desirous of saying something about it to my friends, and naturally turned to the lantern for help. I got a very fine set of slides, but they contained nothing but buildings. My idea was, when exhibiting the buildings of any particular country, to show some types representing the life of the country; but such slides I could not find, though I looked through all the shops and catalogues within reach. It is strange that the slide-makers, in producing a series of slides for any country, scarcely ever give more than the buildings of the country—sometimes a bit of scenery, but scarcely ever the little points that distinguish one people from another. Why is this?"

News and Notes.

THE Rontgen Society's next Ordinary General Meeting will be held on Thursday, November 1, at 20, Hanover-square. The presidential address will be delivered by Dr. J. B. Macintyre.

CRIPPLEGATE Photographic Society and Essex and Middlesex Cycling Union Exhibition.—Late entries for this Exhibition will be received up to Monday next, the 29th inst., when all pictures must be delivered.

THE Burnley Camera Club will hold its Second Exhibition of Photographic Work in the Assembly Hall, Mechanics' Institution, Burnley, on Friday and Saturday, January 18 and 19, 1901. The Hon. Sec. is Mr. Percy Brotherton, "Express" Office, Burnley, of whom entry forms and all further particulars may be had.

ROYAL Photographic Society.—The following are the next lantern fixtures:—Saturday, October 27, "Wonders of the Paris Exhibition," by S. J. Beckett; Monday, October 29, "Through County Donegal with a Camera," by Harry Selby; Thursday, November 1, "Some Swiss Pictures," by John Gunston; Saturday, November 3, "Illustrated Lecture on Colour Photography," by E. Sanger Shepherd. The Exhibition of American Photographs arranged by Mr. Holland Day, at 66, Russell-square, will remain open until November 8. Admission on presentation of visiting card.

In connection with the Musselburgh and Fisherrow Trades Prize Brass Band, a grand Bazaar and Photographic Exhibition and Competition will be held in the Town Hall, Musselburgh, on Friday and Saturday, November 30 and December 1, 1900. The particulars of the Open Classes are as follows:—Class I.: (a) Landscape or Seascapes, two prizes; (b) Figure Studies and Portraiture, two prizes. Class II.: Figure or Genre Composition, any size, one prize. Class III.: Best Picture, being the work of a lady, any subject, one prize. All entries to be sent by November 28, to Mr. J. Edington Aitken, 2, Inveresk-terrace, Musselburgh.

Commercial Intelligence

THE Austin-Edwards Monthly Film Negative Competition.—The Prize Camera for the current month has been awarded to Mr. Fred Marsh, 7, Caxton-terrace, Henley-on-Thames, for his negative, "That's Me."

THE Photo-Button Trade.—Messrs. Crayon, Ltd., write: You will be interested to hear that the profits made during the election out of

buttons sold to photographers (not to fancy or toy shop people) directly through our advertisements in your excellent JOURNAL would pay for those advertisements for over three years."

THE Thornton-Pickard Photographic Competition for 1900.—We are informed that the fifteen prizes offered in connection with the Thornton-Pickard Prize Competition have been awarded. The Company state that about 1000 prints were sent in, and that the standard of excellence showed a marked improvement on those entered in the competition of 1898. Several of the highest prizes were taken by lady amateurs, who contributed a full share of the best entries, and whose pictures were conspicuous by their refinement and taste. Many photographs taken with the focal plane shutter which were excellently conceived failed to take prizes because of their lack of proper form, or because of incorrectness of exposure. Notwithstanding this a large number of excellent photographs of moving objects were sent in, and show that an ever-increasing number of photographers are turning their attention to this phase of photography, and are meeting with marked success. A new Competition on similar lines, but including time exposures, is being organized for 1901, full particulars of which will be published. The following is the list of the prize-winners:—Class I. (for photographs taken with the Thornton-Pickard Camera and Shutter): First prize, £15, Pierre Dubreuil, 27, Rue d'Angleterre, Lille, France; second prize, £10, Miss Edith Thompson, Stobarts Hall, Kirkby Stephen; third prize, £5, Miss Agnes Tomlinson, Fishbourne, Chichester; fourth prize, £3, T. K. Evans, 7, Clarendon-villas, Oxford; fifth prize, £2, J. Cooke Smith, Champney, Valois, Switzerland. Class II. (for photographs taken with the Thornton-Pickard Focal Plane Shutter): First prize, £15, Messrs. Jungmann & Schorn, Werder Str, 8, Baden-Baden, Germany; second prize, £10, J. N. Taylor, Christchurch, New Zealand; third prize, £5, Graystone Bird, 38, Milsom Street, Bath; fourth prize, £3, "V. K. R." Bobbili Vizagapatam Dist., Madras Presidency, India; fifth prize, £2, W. Kilbey, 57, Pagoda-avenue, Richmond. Class III. (for photographs taken with the Thornton-Pickard Time and Instantaneous and Snap-Shot Shutters): First prize, £15, Miss E. A. Whieldon, Eccleshall, Lillington, Leamington Spa; second prize, £10, George Millom, 14, Rue de l'Oratoire, Boulogne-sur-Mer, France; third prize, £5, J. Patrick, 75, Comiston-road, Edinburgh; fourth prize, £3, Miss May E. M. Donaldson, 30, Wellesley-road, Croydon; fifth prize, £2, Gordon Clarke, Greenheys, Little Hulton.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
30	Aintree	Social and Dance.
30.....	Birmingham Photo. Society ..	Exhibition of Lantern Views of Swiss Scenery, with Conversational Description and Hints for the Practice of Photographers in Mountain Scenery. Prof. F. J. Allen, M.A., M.D.
30-Nov. 3	Sefton Park	Second Annual Exhibition.
30	Thornton Heath	Shadows. A. C. Baldwin.
31.....	Borough Polytechnic	{ Tele-photography. Ernest Marriage, F.R.P.S.
31.....	Croydon Camera Club	Lantern Slides.
31.....	Photographic Club	Lantern Night.
31.....	Redhill and District	Animals at the Zoo. J. O. Grant.
November.		
1.....	Hull	Lantern Photography. W. H. Atkinson.
1.....	Liverpool Amateur	Smoking Social.
1.....	London and Provincial	Lantern Night.
2.....	Borough Polytechnic	{ Instruction Evening: Printing—Bromide Papers, by Contact.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 23.—Technical Meeting.—Mr. T. Bolas, F.I.C., F.C.S., in the chair.

THE OZOTYPE PROCESS.

Mr. Thomas Manly gave a demonstration of the Ozotype process, of which he is the inventor and patentee, and which is now generally well known. Briefly, it is a method of pigment or carbon printing, in which the permanent support of the picture is itself sensitive to light, a visible image being printed thereon. The printing is conducted by daylight, and as the image is distinctly visible during exposure, the use of an actinometer is dispensed with. The specially prepared "pigment plaster," used in place of the tissue in the carbon process, is not sensitised, but is immersed in a weak solution of acetic acid and a reducing agent (hydroquinone), and squeegeed in contact with the washed print. When dry, the picture is developed in warm water in practically the same way as an ordinary carbon print. There is no reversal of the image, no safe edge is required, the fingers of the operator do not come in contact with a warm solution of a bichromate salt, and no blisters are formed. In the course of his demonstration, Mr. Manly showed the method of sensitising the paper—any good paper may be used—pigmenting the print, and developing. In his original paper, read before the Society some eighteen months ago, he explained that the sensitising solution was composed of bichromate of potassium and sulphate of manganese, and he expressed the

opinion that the image produced by the action of light consisted of binoxide of manganese. The discussion following the demonstration dealt mainly with this point.

Mr. A. Haddon said he had recently made some experiments in order to endeavour to discover the composition of the primary image, and, in his opinion, it was not possible for bichromate of potassium and sulphate of manganese, under the action of light, to yield binoxide of manganese. He thought that neither binoxide of manganese, nor, as Mr. Manly had subsequently suggested, manganic acid, was present; but that the image consisted of manganous chromate. The sensitising solution used by Mr. Manly was perfectly clear, but if the neutral chromate was used instead of the chromate, a precipitate would be formed. In the acid condition no precipitate is formed, and by the action of light a certain amount of the chromic acid is reduced. By diminishing, therefore, the amount of chromic acid present, the acidity of the salts was also diminished, and after a time a neutral, or even an alkaline, state would be reached; in that condition the same salt would be formed as if the neutral chromate and manganous sulphate had been mixed. If the washing of the primary print was continued, a certain amount of the image would be dissolved, because manganous chromate was feebly soluble in water, and Mr. Manly had said that ten minutes' washing was sufficient in working the process. Mr. Haddon had made a sensitising solution by substituting bichloride of mercury for sulphate of manganese, and he had also employed the plain bichromate of potassium, and had in each case obtained pigmented images in the same way as by the Ozotype process, showing that binoxide of manganese was not necessary, and, as he had said, was most probably not present. What was formed in the case of the mercury, in the Ozotype process, and in the plain bichromate image? In his opinion, the Ozotype image consisted of chromate of manganese, the mercury image was chromate of mercury, and the bichromate picture was chromate of chromium. He proceeded to detail the experiments upon which this opinion was based.

The discussion was continued by Mr. Chapman Jones and others, but Mr. Haddon's conclusions were not seriously contested.

COMING EVENTS.

November 6, Lantern Lecture by Mrs. Aubrey Le Blond, "Cities and Sights of Spain"; November 13, Ordinary Meeting, "Photography in the Eclipse of May 28, 1900," by Mr. E. Walter Maunder; November 16, the Traill Taylor Memorial Lecture, "On the Optics of Trichromatic Photography," by Mr. F. E. Ives.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 18.—Mr. J. E. Hodd in the chair.

Mr. Thompson passed round some enlargements on bromide paper; these, when developed, showed a number of apparently insensitive spots, with a tiny black spot in the centre of each. The paper had been kept some time, and the Chairman put the cause down to impurity in the paper or lack of gelatine in the emulsion.

Mr. Manly then gave a demonstration of "Ozotype." In the course of a few preliminary remarks, Mr. Manly said that any paper can be used for this process except that which is called Art Paper. He then proceeded to sensitise two sheets of different surfaces, for which a special sensitising solution is sold. Two drachms of this sensitising solution is taken and poured in the centre of a sheet of the paper to be used. This is then well worked over the surface by means of a bushy hog-hair brush, 3 in. wide by 2½ in. long. This quantity of solution is exactly sufficient to sensitise a sheet of paper 24 in. by 22½ in. The paper is then dried and cut up as required, and will keep good for about two months. It is printed off in the usual way, and then washed in three or four changes of water and dried. A bath is then made up of:

Glac-acetic acid	60 grains
Hydroquinone	20 grains
Water	40 ounces

and raised to a temperature of 70° to 80° F. A piece of pigment plaster of whatever colour one fancies is then put into this acetic bath for three minutes, taking care to avoid air bubbles. The picture is then also put in, and brought in contact with the plaster. The two are then removed and squeegeed, the excess of moisture taken off by blotting-paper, and then hung up to dry. Care must be taken in taking the print off the squeegee board not to cause any separation of the picture from the plaster, or white specks will result. When the prints are dry, they are soaked in cold water for half an hour, or longer if over-exposed, and transferred to the final bath of hot water, 110° F. The support which held the plaster is then stripped off, and the soluble plaster dissolved away, until the picture is complete.

Mr. Manly, on being asked if the paper did not require sizing, said that sizing might only be found necessary with the rough Whatman paper, the ordinary kinds of paper not requiring it. The size recommended, where necessary, is composed of:

Nelson's No. 1 gelatine	20 grains
Glycerine	1 drachm
Water	6 ounces

and is applied by a stiff brush, and finished off with a piece of butter muslin.

A hearty vote of thanks to Mr. Manly was proposed by Mr. Haddon and seconded by Mr. Henderson.

PHOTOGRAPHIC CLUB.

OCTOBER 10.—Mr. Hans Muller in the chair.

Mr. T. Charters White, M.R.C.S., gave an exhaustive exposition of the details attending the application of photography to the microscope in

the study of minute organisms and structures. After thoroughly discussing the question of apparatus and mentioning several forms commercially obtainable, the lecturer described the apparatus for moderate amplification made by himself. The microscope was next described, and then the focussing of the object to be photographed. The crux of the whole question was the determining exposure necessary to produce the best result. The colour of the object is the first difficulty, in itself sufficient to preclude one from giving a table of approximate exposures, but Mr. Charters White gave a few examples from his register of successes and failures, specifying the magnification, the nature of object, objective used, and character of negative resulting from a given exposure which offered some assistance to the beginner.

The lecture was followed by an exhibition on the screen of a number of anatomical photomicrographs, of the human body and its organs, insect and animal life, which were received with demonstrations of approval by the members and visitors present.

Croydon Camera Club.—The demonstration on Wednesday, the 17th inst., was given by Mr. Benjamin E. Edwards, who is not only an adept in many things concerning the gelatine plate, but is also great upon new ideas. Truthful to this last characteristic, he showed members how lantern slides made upon the ordinary rapid gelatine plate (such as Thomas's lantern plates) could be developed in an open dish in a room brightly lit by electric light, much as the slower chloride plate (such as gaslight and crystal) is handled. In order to obtain complete control over results, Mr. Edwards advocated that the development should be sufficiently slow to allow of deliberation in stopping it. For which reason he used a pyro-soda solution, which he found less prone to produce over-development than when ammonia is employed. Mr. Edwards stated that slide-making is so easy that, given a correct exposure, anyone can get twelve good slides out of a dozen plates. But most people did not get six out of twelve correctly exposed, hence the waste of plates. The lecturer developed several plates with the electric lights full on, and subsequently toned several slides with salts of copper and of iron, various depths of "purple"—brown, red, and greenish blue—being obtained. The best result was on a slide which was dipped for five seconds in a solution of ferricyanide of potassium, sulphate of copper, and neutral citrate of potassium. A number of slides illustrating the lecturer's remarks were subsequently shown on the screen. In proposing a vote of thanks, which was adopted with much heartiness by a crowded assemblage, the President stated that the means advocated for changing the colours of the slides were in some respects allied to what he (the President) had shown to the Club in 1898, when similar colours were produced. Some of these were very admirable in effect, but his experience—which others had endorsed—was that there was so much uncertainty in the results which were forthcoming that it was preferable to fall back upon older expedients for obtaining different colours.

North Middlesex Photographic Society.—October 15, Mr. J. C. S. Mummary gave a lecture on "Mounting and Framing." The effect of the print, the lecturer said, was greatly affected by the colour of the mount. If the warm tone of the print was desired to be enhanced, the mount should be of a cold colour, and vice versa. This was illustrated in an exaggerated manner by viewing two pieces of grey card in a sort of stereoscope (a cardboard holder with a dividing piece down the centre, like a U upside down), one piece mounted on bright orange-red paper and the other on dark blue. The piece seen on the blue background appeared a brownish yellow, while the other had a distinct blueish tint. With regard to mouldings for frames, he dealt at some length. He advocated a moulding some portion of which was flat, or deeply hollowed out, set off by lines, to give lights and darks. Most of those stocked by framemakers had too much decoration. A dull polish was best, not the rough wood nor French polish, but like that given by raw oil well rubbed in. With regard to glazing, care should be taken in the selection of glass. It should be thin, as colourless as possible, and of high polish. A carbon print of a warm tone with part unglazed, part with one thickness of glass, and part with two thicknesses was shown; the lowering of the tones under the glass was very marked.

Liverpool Amateur Photographic Association.—October 18, Mr. F. A. Cooper gave a demonstration on retouching and dodging negatives. He dwelt upon the salient points of his subject in a very chatty manner, showing by means of some excellent lantern slides what may be gained by artistic work, both upon the negative and resulting print. Referring to the filling up of pinholes and scratches upon the negatives, the lecturer gave the members a number of practical hints as to the colours, as well as the manner in which they should be used.

Burnley Camera Club.—On Thursday, October 18, Mr. Donald A. Nightingale, the representative of Messrs. J. J. Griffin & Son, gave a demonstration of various velox papers to a good attendance in connection with the above Club. Mr. W. Sutcliffe presided. The following hints given are so valuable as to interest large numbers of workers:—Exposure: As a guide to correctness of exposure, make a print on a strip of paper before printing from the whole negative. This method enables one to determine the exposure to a nicety, and economy in paper results. Have your printing frames at a distance of about six inches from an ordinary gas flame or incandescent electric lamp. To ensure even illumination, gently revolve the printing frame. An alternative method, which is more rapidly applicable, in the case of electric light, is to place the printing frame on a table, and, holding the lamp directly above, move it about from time to time, always at a uniform distance from the negative. Development: Having made the exposure, or series of exposures, moisten the paper by passing it through clean water in a dish—in the case of carbon velox, it is preferable to apply the developer to the dry print—and immediately proceed to develop, either by means of a tuft of absorbent cotton wool or a soft brush soaked in the develop-

ing solution, or, as for bromides, by immersing each sheet in the developer contained in a dish. In either case development proceeds rapidly, is complete in about twenty seconds with carbon and the ordinary varieties, whilst the special papers develop somewhat less rapidly, in half or three-quarters of a minute. Should the prints on development have greyish whites, add more bromide, say one or two drops of ten per cent. solution to the ounce. In addition to producing slightly increased contrast, the further bromide gives brilliancy to the resulting print. Greenish or brownish blacks will result if too much bromide be present. Over-exposure also occasionally produces similar results. But this, of course, may be determined by the rapidity of development of the print. Greatly over-exposed prints become fully developed in quite a few seconds, and in many cases development is not uniform over the whole print. Rinsing and Fixing: The fully-developed print should be rinsed very rapidly—merely passed through a little clean water contained in a dish—and then transferred to the fixing bath, which for preference should contain the acid solution prepared according to formula. During the first few seconds of fixing each print should be kept moving in the fixing bath, in order to avoid the possibility of stains resulting, and immersion for five to eight minutes in the fixing bath is amply sufficient. When fixed the prints are transferred to the washing water, in which they should remain for about one hour. Drying: Velox prints may be dried by any of the usual methods. Perhaps the simplest is to lay the print face upward on a piece of blotting-paper. Points to be Observed: To avoid stains use fresh developer, and take care that the rinsing, both before and after development, is speedy and thorough. Use preferably an acid fixing bath, as per formula. Avoid excess of pot. bromide in the developer, but whenever the print yields greyish whites increase bromide up to three drops per ounce, in addition to proportion for normal developer. Wherever markings occur on the surface of velox prints erase from the dried print by means of cotton wool well moistened with methylated spirit. Avoid prolonged development, on account of its tendency to produce stains.

Glasgow and West of Scotland Photographic Association.—The Annual Meeting of this Association was held on Monday evening, the 15th inst., in the Rooms, 180, West Regent-street, Glasgow. Mr. J. C. Oliver presided. Mr. William Goodwin, Hon. Secretary, read the report for the year, which showed that, after deleting thirty-two names from the roll, there had been a net gain of ten members on the year. The meeting then proceeded to the election of office-bearers, when the following appointments were made: President, Mr. Thos. W. Robertson; Vice-President, Mr. George Watson; Hon. Secretary, Mr. William Goodwin; Hon. Treasurer, Mr. W. J. B. Halley; Hon. Curator, Mr. G. S. Bryson; Members of Council, Messrs. Oliver, Todd, Arch. Watson, Garry, William Miller, Geo. Chalmers, J. W. Reoch, J. Imbrie Fraser, and A. J. Kay. On the representation of the Council, it was agreed to remit to the Council, with powers to set aside, the resolution of the General Meeting held last April “to abolish classes and to award no medals” at the forthcoming winter Exhibition of the Association. The Council expressed a strong opinion that this experiment should be delayed for a year, in view of the invitation the Association had received to send in selected pictures for the approval of the Photographic Sub-Committee of the Fine Art Section of the Glasgow International Exhibition of 1901. In demitting office as President, Mr. Oliver regretted that the Association were still without rooms of their own, but although not yet owners of their rooms, the subject was not being neglected, as they could not rest satisfied until they had a property of their own which could be fitted up in a manner worthy of the importance of the Association. Cordial votes of thanks were passed to the retiring office-bearers and Members of the Council. The success of the Technical Meetings last winter has decided the Council to arrange for another series this winter.

FORTHCOMING EXHIBITIONS.

1900.

- October 26–Nov. 3 ... Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- “ 26–Nov. 3 ... Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- “ 30–Nov. 3 ... Sefton Park Photographic Society. Hon. Secretary, G. Birtwhistle, 7, Gainsborough-road, Sefton Park, Liverpool.
- November 7–10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
- “ 12–17 Ashton-under-Lyne.
- “ 19–24 Waterloo and Blundellsands Photographic Society. Hon. Secretary, W. G. Eyre, 2, Mersey-road, Blundellsands.
- “ 21–23 Hackney Photographic Society. Hon. Secretary, W. Selfe, 70, Paragon-road, Hackney, N.E.

- November 21–24 Cleveland Camera Club. Hon. Secretary, F. W. Pearson, 98, Victoria-road, Middlesbrough.
- “ 22–24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove. 1901.
- January 14–19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Patent News.

THE following applications for Patents were made between October 8 and October 13, 1900:—

- CAMERAS.—No. 17,802. “Improvements in the Manufacture of the Photographic Camera.” R. F. BROWN.
- EXPOSURE METER.—No. 17,876. “Nature's Photographic Exposure Meter.” H. L. STEVENS.
- APPARATUS.—No. 17,986. “Improvements in and connected with Photographic Apparatus.” A. A. BROOKS and G. A. WATSON.
- CAMERAS.—No. 18,007. “Improvements in or relating to Photographic Cameras.” Communicated by F. A. Brownell. KODAK, LIMITED.
- CINEMATOGRAPHIC APPARATUS.—No. 18,029. “Improvements in Cinematographic Apparatus.” W. GIBBONS.
- COLOURING PHOTOGRAPHS.—No. 18,121. “An Improved Machine for Mechanically Colouring or Tinting Fashion-plates, Engravings, Photographs, Maps, and the like.” J. M. LORIMEY.
- APPARATUS.—No. 18,131. “Improvements in and connected with Photography and in the Photographic Apparatus requisite thereto.” J. F. LE PAGE.
- FILM-HOLDER.—No. 18,186. “A Frame or Holder for Facilitating the Handling of Photographic Films and the like.” J. NICOLAIDI.
- PRINTING.—No. 18,252. “Photographic Printing-out Apparatus.” A. PICKARD.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

SUN PRINTING.

To the Editors.

GENTLEMEN,—A print a minute; it takes one's breath away, and makes one say, “Good gracious.” Why, sir, my printer is paid £2 a week, and during the summer if he gets off 12 or 15 ferro-prussiate prints in a day, size 40 × 30, he thinks he has done wonders. The exposure here is, I know, at least 12 minutes, and often 15, in the sun, and 20 to 30 minutes if dull or cloudy for each print. Our work is chiefly 40 × 30, from tracings, not glass negatives. To-day (Saturday, October 20) the exposure is 1½ hours.—I am, yours, &c., T. H. A.

THE SAN FRANCISCO SALON.

To the Editors.

GENTLEMEN,—Under separate cover please find announcement of the first Salon to be held on the Pacific Coast.

It is hoped by the management that the success of the Exhibition will be so evident, and the interest excited so great, that an annual repetition will be necessary.

We wish you to assist us in giving as wide publicity as possible to the announcement, and in keeping the matter before the public.

The Pacific Coast has always taken a lively interest in the salons of the East, and now that we have one of our own we feel that the bonds are growing closer, thus making it possible to realise that unity of action so frequently advocated in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY.—We are, yours, &c.,

THE COMMITTEE.

THE LATE THOMAS FALL.

To the Editors.

GENTLEMEN,—No doubt you will have many letters expressing regret at the decease of Mr. Thomas Fall. I have known him for

nearly 20 years, and am sure his many acts of kindness speak for the goodness of heart he had. Personally, I am much indebted for his ever ready advice and assistance, and feel sure there are several who will endorse my sentiments that he was a "friend in need" and a "friend indeed" to many. I think it only a fair tribute to his memory that his good qualities should be made known, and I hope to see you make a public announcement of the loss of a good man.—I am, yours, &c.,

G. W. SECRETAN.

210a Tufnell Park-road, London, N.

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

- A. J. Lovell, 27, Wellington-row, Whitehaven.—Photograph of Mr. E. G. Hughes.
- E. H. Roberts, 30, High-street, Marlborough.—Photograph of Marlborough Town Hall.
- C. De Lavedre, 328, Renfrew-street, Charing Cross, Glasgow.—Four photographs of R.C. Archbishop C. Eyre, of Glasgow.
- J. Berry, 28, Mincing-lane, Blackburn.—Photograph of guns firing, 3rd Lancs. Vol. Art. Photograph of No. 3 Battery, 3rd L. V. A. Two photographs of officers, 3rd L. V. A.

GLOSS ON PRINTS.—B. M. asks whether the same high gloss can be produced on albumenised paper with a roller burnisher as a bar burnisher.—Yes, if the roller burnisher is a good one, and it is used with heavy pressure and well heated.

MEHAUL.—There is nothing to be said against your selection of the 12-inch lens, if you intend confining yourself to one class of work. But if (as we suspect) you intend varying your subjects, the 9-inch (or mid-angle) would probably prove the more useful in the long run. So far as we can guess your requirements, the latter is our recommendation.

CELTIC.—We are sorry that we cannot break our rule in your case. In reply: (1) We believe the gentleman named to be thoroughly respectable and genuine. (2) As to the Polytechnic, it is an excellent institution. Some of our personal friends are among the teaching staff, and we know many photographers who have profited by the instruction.

A. H. TYLER.—We do not see why you should fail in getting good negatives of the character you desire. If you employ photo-mechanical plates, there should be no difficulty whatever. Try another developer—say kachin or metol and hydroquinone. The wet collodion process will give the character of plate desired better, perhaps, than a gelatine one; but the latter, if rightly manipulated, will yield nearly equal results. Intensification of the negatives would probably help you.

PHOTOGRAPHY IN AUSTRALIA.—B. C. P. writes: "Would it be advisable for me, as a photographer's assistant, to go to Queensland? If so, could you kindly give the name of any paper like yours, and address of office, through which I could advertise for a situation?"—In reply: We think it would be most inadvisable at present. From what we can gather, Australian professional photography is not in a flourishing state. If our correspondent is an able man, he is far more likely to succeed in this country.

A CASE OF UNDER-EXPOSURE.—PYRO writes: "Enclosed please find negative and print. On holding the negative, film side upwards, over anything dark, the image can be seen quite plainly. Could you tell me what is wrong, as this class of negative rarely gives satisfactory prints?"—In reply: The negative is under-exposed, and forced in development. So far as we can form an estimate from the negative and print, at least four times the exposure would have been required. Better devote a little time to experiment.

SENSITISING OPALS.—A. C. PRICE writes: "I should be much obliged if you would tell me how to sensitise opal for bromide enlargement; also if there is any emulsion sold ready prepared for that purpose."—No emulsion is sold for the purpose, and you will, therefore, have to make it yourself. In the ALMANAC for 1896, pp. 282-3, are a number of formulas for gelatino-bromide emulsions. From those you will be able to select one that will, with a little modification, suit for opals. As you appear to be a novice in the preparation of emulsions, we should advise you to get Abney's work on gelatine emulsion processes.

PHOSPHATE OF SILVER PROCESS.—BEDS asks where he can get some phosphate of silver paper, such as was referred to in the JOURNAL some time ago; also some collodio-chloride rapid paper with the phosphate. So far as we know, the papers have not yet been introduced commercially in this country. The former kind we think is in the American market, but we are not quite sure.

ENAMELLED IRON DISHES.—THOS. RAY. Enamelled iron baking dishes will do very well for the hypo solution for fixing prints, provided the enamel is perfect. If it is imperfect, and there is bare iron exposed, they should be avoided, as the iron would produce stains if the prints laid in contact with it. If the enamel is perfect, enamelled iron ware can be used for all photographic purposes.

RAPIDITY OF LENS.—G. WALLER. We should recommend you to decide on the lens with the larger aperture for winter work. The one with the aperture of f-5.6 will have double the rapidity of the one of f-8, when both are worked with their full openings. Though the latter, it should be remembered, will have the greater depth of focus unless the former is stopped down to f-8; then they will be equal, and of the same rapidity.

TERMS OF LEASE.—W. W. asks: "Who is responsible for the repairs of a studio and rooms when they are taken on a seven years' agreement—the landlord or the tenant?"—It all depends upon the terms of the lease. If you read it through, you will see. In a seven years' lease it is usually specified that the tenant has to keep the premises in repair. But, as we have said before, it all depends upon the terms of the lease. Read it through.

BROMIDE ENLARGING.—J. COX writes: "Herewith please find two bromide enlargements I made with —'s enlarging apparatus. One, you will see, is weak and flat; the other is hard, and the colour is a nasty inky black, with nothing in the lights. —use amidol for developing, and, do what I can, I cannot get results like those done by professional enlargers. Do you think first results can be got with the apparatus?"—Yes, certainly. The fault with the examples sent is in the exposure. The flat one is very much over-exposed, while the other is as much underdone. It is merely a question of exposure. An exposure about mid-way between the two given would have yielded satisfactory pictures.

A COPYRIGHT QUESTION.—"VACUUM CAPUT" says: "To make a trade and scratch a living, I ask parents to bring their babies, or any of their children, to be photographed. I take a flashlight photograph in the evening, and, should the parents wish to buy one, I sell one for sixpence. There are one or two men here who copy my work, and undersell me in larger work. These men cannot work in the evening, and I think they are doing me a wrong. Will you please tell me if the copyright of the sixpenny picture is mine?"—In reply: No; the mere fact that the parents pay you for the photographs settles the matter. And, besides, as we have often pointed out, although the copyright were yours, you would have no remedy unless you registered it at Stationers' Hall.

NEGATIVES FOR VIEW PUBLICATION PURPOSES.—VIEWS writes: "I have been asked by a stationer to take a number of local views (half-plate size), the whole to form a book of views for selling. Not having done any of the kind before, I am asking if you could kindly tell me what is the usual price to charge for each negative, the negatives to become the property of the stationer? Awaiting the favour through your correspondence column."—There is no usual price. It is always a matter of mutual arrangement between the parties. Much, of course, depends upon the excellence of the work, and also the distance it is done away from home, &c. As the negatives are to be the property of the customer, we should say that from 15s. to a guinea each would be a fair price. That is, supposing the pictures are of a good class.

SILVER STAINS.—PRINTING PROCESS.—PYRO writes: "(1) I have got some of my best negatives silver stained. What can I do to get this out of the negatives? (2) I have just commenced business for myself, and have seen in good-class houses a style of printing I should like to adopt, and should be thankful if you could assist me. It is instead of the glossy warm-toned P.O.P.—a sort of black and white on matt paper, but very soft. Is it the platinum toning-bath process on matt paper?"—(1) The stains may sometimes be removed by treating them with a dilute solution of iodine in alcohol until they become pale; then put into the hypo bath. Some stains, however, are very difficult of removal. We should advise you to get a bottle of King's solution for the purpose. It is sold by Marion & Co. (2) The prints you refer to are in all probability platinotypes.

STUDIO ALTERATIONS.—G. P. W. writes: "Would you kindly advise me as to whether the alteration which I contemplate making in my studio is the best I can make under the circumstances. As you will see by the enclosed plan, the side-light is very insufficient for photographic purposes, and on account of the present low pitch of roof I have suffered much inconvenience both from sunlight and rain. The studio is 37 feet long and 12 feet wide, and the proposed alterations will cost £35. Would you advise rough-rolled plate or frosted glass? I wish to get soft lighting. The sides of the studio are low, but I do not wish to alter them, if possible."—The proposed alteration will be a decided improvement, but it would be a still further improvement if the side could be raised somewhat. It would be a help if the wall at the side were whitewashed. Frosted glass is a little difficult to keep quite clean, and when it is dirty it stops out a great deal of light.

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EX CATHEDRÂ.

THERE was a meeting of the Council of the Photographic Convention of the United Kingdom in London last week. The balance-sheet of the Newcastle meeting was presented and adopted, whilst the general balance-sheet—that which deals with Convention finances as a whole—was also passed. Those finances are in such a healthy state that £50 was ordered to be added to the amount already funded, bringing the latter sum up to the handsome total of £200. There are few photographic societies in the United Kingdom which, after payment of all expenses, have a good balance in hand, and two hundred pounds to fall back on in case of need. For this gratifying state of affairs that good man of business, Mr. F. A. Bridge, is entirely responsible, and we are sure that it will delight Conventioners all over the country to learn that the Council unanimously re-elected him Honorary Secretary and Treasurer for the ensuing year. To fill a vacancy in the Council, Mr. W. J. Croall, the well-known and esteemed amateur photographer of Edinburgh,

was chosen. A letter was read from Sir William Herschel cordially accepting his nomination to the Presidency of the Oxford meeting of the Convention, and promising to do all in his power to promote its success.

* * *

LAST week we briefly contrasted the methods of American and British manufacturers, not specially with reference to the production of microscopes, although the contrary was inadvertently suggested; and we have been pleased at the receipt of a vigorous rejoinder from Mr. Conrad Beck, who takes up the case for the defence. Says Mr. Beck:—"It does seem to me extremely unfair that British journalists should consistently and deliberately belittle their own country, and praise up the foreigners, without any cause whatever. Let me draw your attention to the preface of the enclosed description, where we ask for the support of scientific men to assist us in helping our manufactures. Every year we send a representative round to see every prominent professor in this country and gather his views as to the requirements of his students, and my experience of American methods of doing business is that in questions of courtesy and remedying defects which may occur in the manufacture, Englishmen will always give them points; but it is the fashion of the Press to regularly belittle everything that is done by Englishmen, whereas it is the fashion of both German and American papers to assist their own manufacturers in every way they can."

* * *

In the preface to their microscope catalogue Messrs. Beck state: "We have been able to produce an instrument exactly suited to modern requirements, at a price considerably less than that of any similar microscope, whether made in England or abroad. We ask for the cordial support of scientific men in this enterprise, as, although this instrument has been made from data supplied by our most prominent microscopists, suggestions from earnest workers are our best means of improving our products, and will be gratefully received. We have during the last two years been laying down an extensive plant of American and German machinery." If all British houses—and we, of course, are

not confining our remarks solely to photography—combined alertness with energy in such a commendable fashion as the honoured firm of Beck manifestly does, there would be fewer of the “belittling” strictures referred to by Mr. Beck published in the newspapers, whose objects, however, we can scarcely agree, are to deprecate home products at the expense of foreign productions. We lean to the view that at a time like the present, when the nation is being attacked by that disturbing complaint known as war fever, it is the duty of responsible journalists to force what are perhaps larger and more important issues before the public eye. For example, an intelligent study of the Paris Exhibition cannot but persuade the thoughtful Briton that the commercial and manufacturing supremacy of this country is being gravely threatened from every side.

* * *

INDEED, at the moment Mr. Beck's letter reached us we were actually perusing a series of articles dealing with this very subject. One passage in them referred to American advances in machines in these words: “It is quite evident that the Americans have certain mental habits and qualities which give them a great advantage. Their curious versatility and inventiveness are mental gifts that probably cannot be acquired, but their remarkable grip of these essential points of a mechanical problem is mainly the result of close attention and thought, and can be acquired perfectly well by English mechanics by systematic training. Their thorough grasp of the fact that cheap manufacturing means perfect interchangeability of parts, and that this is only obtained by extreme perfection in each piece, has induced a practice of accuracy and finish that reacts upon the whole of their work, and is producing an immense effect upon their foreign trade. There can be no doubt, too, that more general interest is taken in practical mechanics in the United States than in England.” We are the last to wish to belittle English manufactures or to unduly exalt the work of our foreign competitors, whose immense progress in most branches of industry, on the other hand, it is foolish to ignore or under-estimate. For the full discussion of such a large subject as this a photographic journal is not the most suitable arena; but we are nevertheless obliged to Mr. Beck for the opportunity he has given us of making these references, while at the same time we congratulate his firm on being in the van of progress.

* * *

THE Report of the Examinations Department of the City and Guilds of London Institute for the session 1899-1900 was issued last week. Intending candidates in the photographic sections of the examination of next May will be wise if they lay to heart some remarks of the examiners on the work done at this year's examination. These gentlemen subject that work to the following strictures:—“The lack of sound knowledge of even the fundamental parts of photographic optics referred to in last year's report is still very marked, and not a single complete answer was given to any one of the questions on optics in either grade. In the Honours Grade, some candidates showed a very fair knowledge of processes, but were lamentably weak in their knowledge of the rationale of the processes as a whole, and of the why and wherefore of the modifications made to meet special cases. More attention seems to be required to the elements of photographic chemistry. In both grades

there are indications that some candidates fail to do themselves justice from want of previous experience in answering set questions; they either fail to grasp the meaning of the question, or fail to answer in sufficient detail. Teachers will always find it useful to themselves and profitable to their pupils to hold written class examinations at intervals during the session. There was also too much of what may be called the ‘general reader’ type of answer—verbose, but vague, and giving no evidence of that precise and definite knowledge which alone (however limited its range) is of real value from a practical point of view.” With regard to the work in the photo-mechanical section, the examiner remarks: “The answers to the questions this year show a marked advance in technical knowledge of the special subjects studied; there is, however, a tendency in many cases to confine attention to only one or two branches. It is desirable, and indeed necessary, that students should master the principles, at least, of each of the sub-sections into which photo-mechanical work is divided, and it is furthermore desirable that the candidates should possess an intelligent knowledge of photographic chemistry. Even the names of some of the chemical substances commonly employed are often incorrectly given, and this has tended to reduce the value of otherwise very creditable papers.” It is only fair to mention, however, that in our opinion the questions set at these examinations are by no means of a simple kind. They might fairly be called stiff. But the Institute and its examiners deserve support in their efforts to raise the standard of photographic knowledge.

LOCAL GUIDES.

It has been said that, speaking generally, guide-book publishing does not pay any one. Probably this was not intended to include the printer, who, naturally enough, does not, as a rule, print guide-books for nothing.

Guide-book publishing, like numerous other ventures, probably pays passably well if it is worked on a sufficiently extensive scale, and most districts which are freely visited by tourists have been fairly well dealt with by the well-known guide publishers. They, however, have not quite the monopoly in this matter, for some very useful and attractive publications of this class have been produced locally. But, unless the district has some particular features, it is by no means easy to produce a guide which will prove commercially successful.

Those who should know say that there is evidence of a revival of interest respecting topographical matter; and, among other publishing ventures in the course of preparation, there is an ambitious one, no less than a sort of second Domesday Book, which will deal comprehensively with every county. Whether this record will be illustrated, we are not able to say positively. If it is to be illustrated, it should provide good scope for the energies of the members of the National Photographic Record Association; and it is to be hoped that this useful organisation will be given an opportunity to render any assistance calculated to enhance the value of such a work.

Local photographers might probably, with profit, do more in the way of local guide publishing than they have done. They may not make much profit out of the sales; but, indirectly, they may benefit very considerably.

A photographer, well known in London, has recently

established a branch in the provinces. He has gained a reputation for portraiture, and his clientele includes members of the Royal Family and other distinguished personages; but at his provincial branch he is not content to confine his attention to portraiture, and he has recently issued an attractive book consisting of reproductions of photographs from half-tone blocks, with brief explanatory letterpress, dealing with a well-known personality. The subject, admittedly, is somewhat hackneyed; but, so far as we were aware, it had not been dealt with quite in the same way, and certainly not so comprehensively. As a result, we have a very interesting document, which, apart from the sales, should prove a valuable advertisement to its producer.

A publication such as that just referred to necessitates the expenditure of a considerable sum of money which every photographer cannot afford. But, possibly, those photographers in humbler circumstances could, with advantage, do something similar in a minor way. If he be a dealer in photographic apparatus and materials, he might illustrate his catalogue, which, if it did nothing else, might keep it out of the wastepaper basket a little longer than would otherwise be the case. Besides the illustrations, a certain amount of local topographical matter might be introduced.

If the photographer has his establishment in a district which has not been covered by the guide publishers, he might with advantage consider whether he could not publish something that would prove serviceable to visitors, &c.

In these days, when it is possible to purchase a novel, consisting of some 400 pages, by a well-known author, for a few pence, people expect a good deal of matter for their money. They do not always consider the circumstances. The novel is published in its many thousands; a local guide-book frequently has a limited sale, and, consequently, it is impossible to put the same amount of matter into the latter, and sell it at the same price as the former. Then again local support is a feature usually to be considered in such cases, tradesmen and others being, as a rule, by no means unwilling to advertise in widely circulated guide books of the town in which they conduct their businesses. This should be obvious enough to anybody, but it is not. Good printing, maps, and half-tone blocks cost money. If, however, it is decided to take up the matter, it is certainly desirable to issue something which will directly, or indirectly, prove a source of profit to the publisher. If the profit cannot be ensured from the sales, it is quite possible to see that the publication is effective as an advertisement.

As a model, we would recommend J. Salmon's pictorial guide to Sevenoaks, admirably illustrated by Mr. C. Essenhugh Corke, F.R.P.S. Of course, in many instances, through various reasons, such as a less attractive, and, consequently, a less visited district, the guide would not equal the publication referred to as regards size and attractiveness. This particular guide is one of the best of its class, and it is in every sense of the word a local publication, being prepared and illustrated by local men and printed by its publisher.

In most districts, there are persons well versed in local history and possessing an intimate knowledge of the county. There are writers, too, who make a business of preparing the letterpress for guides. But it is preferable to put the work in the hands of the former rather than the latter, who are sometimes little more than literary hacks, who

expect far more for their matter than it is worth. Some of the members of the latter class require careful handling. In any case, you are more likely to obtain trustworthy matter from a person who has lived in the district for years, and who has made a special study of the country, than from a compiler who is a stranger to the locality. To the former the preparation of the letterpress will be a labour of love, although, of course, he should be paid a reasonable sum for his services.

As to the illustrations, this would be a matter for consideration, and would depend upon circumstances. By all means, if possible, let them be numerous, and be printed on good paper.

The Nernst Lamp.—It is rather singular that so little is heard of the Nernst electric lamp, especially in connexion with photography. The first use of electric light for studio work on an important scale was on the arc principle; but, latterly, many incandescent light installations have been adopted; each style has its advocates. The latter system is so very simple that it is bound to find favour: a switch equivalent to the tap of a gas burner is turned on and the light is at once ready for use, while with the arc either a special adjustment has to be made each time the light is restarted, or, in the case of an automatic lamp, some little time has to elapse for the light to settle down to a steady value. But much greater intensity and consequent reduction of exposure is better obtainable with the arc than with the ordinary incandescent lamp. The Nernst lamp, however much more nearly approaches the arc light in intensity of light and in its actinic value. It is true that the Nernst is, on account of its more complex construction, more costly at the outset, and that its life is shorter than the ordinary carbon filament lamp. But against this we have first to reckon that the Company who run the new lamp will allow two-thirds its value if returned when a new one is purchased: and, secondly, the consumption of electricity is less. The power employed in the present type of lamp is from $1\frac{1}{2}$ to $1\frac{3}{4}$ watts per candle, and an ordinary lamp needs about double this. It will be remembered that light is produced by the incandescence of a filament of refractory oxides. When cold, this filament will not permit the current to pass; but, when heated first, it becomes much less resistant, and the current causes it to glow at a much higher temperature, and consequent increased brilliancy, than the carbon can sustain. In the first lamp made the preliminary heating of the filament was brought about by a match or a spirit lamp; but as this involved the very practice that the older incandescent lamps were supposed to have banished—the striking a match, &c.—another more intricate form of lamp was designed in which the first heating was brought about automatically by a spiral of platinum wire coiled round the refractory oxide filament, the current then being switched off automatically when the filament was heated, the lamp giving a brilliantly white light. The average duration of a filament is three hundred hours, but this is governed by the mode of use. Thus, if the light be rushed as it were, and the full intensity quickly produced, it does not last so long as when a little time is allowed for the full brilliancy to be obtained.

Personal Risks from Studio Arc Lamps.—When the arc light first became an important factor in portrait work, the carbons were only adjustable by hand, and there was always the risk of the operator accidentally receiving a "shock" of a dangerous strength, through inadvertent handling of the metallic adjustment. This lamp was due to the inventive genius of Mr. Vander Weyde, who for the benefit of other users, described the plan adopted by his operator. It was simply to invariably employ one hand only, and, to ensure this being carried out, he made a point whenever he adjusted the carbons of always keeping one hand in his pocket so as to avoid its involuntary use. The intensity of the shock given by interposing the human body in the circuit depends, of course, upon the voltage of the current, and some little time ago Professor Weber of the Zürich Polytechnic, undertook a series of experiments upon his own

person to ascertain the effects of currents of various strengths. The details will be interesting to all who employ electricity in their work. Using his wetted hands to receive the current, he found ten volts to produce feeble trembling of the fingers, and, increasing it by successive increments of ten volts, these effects were gradually intensified till, upon fifty being reached, instantaneous paralysis of all the muscles of hands and arms set in and the hands could not be released. Two seconds was the utmost limit of his endurance of the pain. With his hands dry, he found at forty volts the fingers only slightly tingled; at eighty the hand was cramped and ached in every part, and great effort was required to release the wires. When a further ten volts was added the effect was highly intensified, the hands entirely paralysed and unable to release the wire, and the pain so great he involuntarily called out. Upon returning to the eighty volts the difference was so great that the effect seemed quite feeble in comparison with the ninety volts. Professor Weber's conclusions are that the simultaneous touching of both the poles of an alternating current circuit is dangerous as soon as the pressure reaches 100 volts; and, as it is impossible to set the fingers free, the case must be considered fatal whenever immediate help is not at hand. He describes three cases where death ensued by touching with both hands non-insulated leads at voltages, respectively, of 240, 300, and 500. We may conclude with Professor Weber's dictum, that "in spite of the great number of disasters which have already happened the danger does not seem to have been generally appreciated. . . . That disasters have not more frequently happened is due to the fact that help has been at hand instantly."

Enamelled Ware in Photography.—On several occasions lately, we have had to reply in the Answers columns as to the suitability of enamelled ware, which has now become so popular for many domestic purposes, for use in photography. It is, no doubt, its cheapness that has commended itself to the querists. Now there is enamelled ware and enamelled ware, for it is not all of the same quality. The dishes and trays, specially made for photography, are of a much better quality than those usually sold at the hardware shops for domestic uses; but are, necessarily, considerably higher in price. However, the ordinary thing is excellent for most photographic purposes, and it has many advantages over the ordinary "porcelain" dishes. It is, as most are aware, iron or low steel, sandwiched between two layers of the enamel, a quite inert material. But if this surface is imperfect, either from the manufacture or from its receiving injury afterwards so that the metal is exposed, it is manifest that such vessels should not be used for some purposes in photography, such as for containing silver solutions, for example, as then the exposed iron would reduce the silver to the metallic state. They, in this condition, are not suitable for the hypo fixing bath, as the prints if they rest in contact with the metal might be marked or stained. There are many uses to which these vessels may, however, be put, even though the surface be damaged, in photography. Almost from the first, enamelled ware has been employed for the developer in the platinotype process, and here a slight damage to the glaze is not of importance. For washing prints the common ware of the shops answers as well as the best. In the carbon process it is invaluable, common though it be, for, if there be considerable imperfections in the enamel, it will not in any way interfere with the work. One of the great advantages of this ware is that it will stand heat. Boiling water may be poured direct into it with impunity, or a spirit lamp or gas flame may be put under it without risk, though few would care to risk putting hot water direct into a porcelain dish or putting a spirit lamp beneath it to keep the contents warm. It is for this reason that enamelled ware commends itself so well to carbon and platinotype workers, added to its practical unbreakability. Though its surface may, by careless treatment, become cracked, which will render it unsuitable for some photographic requirements, it is still usable for others.

Retarded Development.—We have experienced "chill October," and some inexperienced photographers have not realised

its influence on development. A few days ago we were consulted by an amateur who has just commenced the development of a large number of plates exposed a month or two back. His trouble, he told us, was that they were all under-exposed. He said he was sure on that point because the image did not appear until a very long time after the developer was applied, and then, after prolonging the time usually required to get density, the negatives were thin and feeble. Now, as a matter of fact (for we developed some of the plates and they were fully exposed), the tardy appearance of the image was entirely due to the depressed temperature during the short spell of cold weather we had two or three weeks back, and allowance was not made for that. Indeed, the necessity for that was not fully realised by our friend. Not only had the temperature of his dark room become depressed some ten or fifteen degrees, but the water supply from which he diluted his stock solutions of developer had become correspondingly colder, hence the trouble. Had longer time been given with the plates he had developed, good negatives would have resulted, even with the conditions in which he worked. When the temperature of the atmosphere in the dark room, and that of the water for making the developer, is down to the low fifties, 51° or 52° F., development of even fully-exposed plates becomes slow, and a much longer time must be allowed before under-exposure should be assumed. 60° to 65° F. should be considered the standard temperature of the dark room and the solutions, and, as it falls below or exceeds that, due allowance should be made for the deviation in judging the exposure. Our reason for referring to the subject now is, as the weather will soon be getting colder, to call attention to the fact that temperature is a factor, and an important one too, in every phase of photography, and must be met accordingly.

Coagulating Albumen.—At a recent meeting of one of the London Photographic Societies reference was made to coagulated albumenised paper, and it was stated that it was very difficult to procure. Although it may be difficult to procure now, it is easily made by treating albumenised paper with alcohol. Strong alcohol however, will not coagulate dry albumen, the presence of water is necessary. If the paper be passed through ordinary commercial alcohol diluted with an equal bulk of water the albumen will be perfectly coagulated, and rendered insoluble in water. The albumen may also be coagulated by heat in the presence of moisture. Dry steam will not coagulate it, but moist steam will. At one time coagulated albumenised paper for silver printing was an article of commerce; but we believe its manufacture has since been discontinued, or at least we have not heard of it of late. It was said to have certain advantages over the ordinary, one was that it did not blister; another was that it kept better after it was sensitised. But, of course, it was somewhat more costly than the ordinary paper.

Another Application of the Röntgen Rays.—The uses to which the Röntgen rays are now put, or said to be applicable, are indeed multitudinous. The Berlin correspondent of the *Standard* one day last week, telegraphs that Signor Brigitte, of the State-Archives, in Rome, has found that the rays can be utilised, in certain cases, for the examination of and copying manuscripts concealed under the covers of books, &c., as the rays penetrate wood, leather, and cardboard. This, it is added by the correspondent, can only be done when the ink contains some mixture of lead, cinnabar, or ultramarine, and in that case the rays will also serve for the detection of forgeries in manuscripts. One frequently reads of such things as bank notes being found concealed in old Bibles, and the like, but it is clear that as they are printed in an ink of the same composition as the book they could not be detected by the Röntgen rays. Few inks that are used for manuscripts, again, contain either of the materials referred to, or analogous substances, so that the alleged utility of Röntgen's discovery in this direction is considerably discounted. Still the idea is novel.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

II.—EDMOND BECQUEREL.

WE shall occupy ourselves, for the present, with Becquerel's *La Lumière, ses causes et ses effets* (1867-8, 2 vols.) The work is purely experimental in its manner of dealing with the subject, and there are very few theoretical considerations. Both on account of the general interest this book must have for photographers, and for the purpose of giving some idea of the place which Becquerel gave to his photochromatic investigations in a work containing the greater part of his researches on light for the thirty years preceding the above date—a union which showed, in his own words, that his researches were all directed towards the same end, that of studying the questions of molecular physics which are connected with the transmission of light or the particles of bodies; questions which relate to one of the most important and delicate parts of physics—we will first give a short indication of the contents of the volumes. Then we will go more particularly into his photochromatic experiments and the considerations which he adduced as possible explanations, and which influenced the development of *interference photochromy*.

It should be remarked, *en passant*, that, throughout the whole work, Becquerel gave such full references that his book would be of the greatest value for a history of, for instance, the discoveries on the physical and chemical actions of radiation.

The first volume (1867), on the sources of light, is divided into many books. After preliminaries (general considerations on "les sources célestes ou météoriques."):—

i. Book i. contains the history of works on phosphorescence, chiefly from the beginning of the fifteenth century until 1840.

ii. Luminous effects produced by molecular actions (phosphorescence by rubbing, cleavage, and crystallisation).

iii. Luminous effects produced by heat. Study of sources luminous by the elevation of temperature, comprising not only phosphorescent effects by the action of heat, but also phenomena of incandescence; that is to say, it relates to the majority of luminous sources actually used in industry. Ratios of the lighting powers of these different sources, and pyrometric processes capable of indicating their temperature.

iv. General principles of the analysis of light by refraction and results of researches on the bright and dark (ultra-violet and infra-red) rays of luminous spectra. Spectrum analysis and its meteoric and celestial applications.

v. Luminous effects produced by electricity.

vi. Luminous effects (phosphorescence) produced by the action of light (contains a *résumé* of Becquerel's different memoirs on the subjects). Indication of the methods of preparation of the matters which have been called "phosphores artificiel," and results of observations with the phosphoroscope (which prove that a great number of bodies emit light in virtue of an action proper to them, and that by a persistence of effect due to the influence of the luminous radiation). A specially important and long book.

vii. Phosphorescent effects produced by organic bodies (vegetables and animals).

In the second part, on the effects of light (1868), the preliminaries were devoted to various effects produced by light. Extinction of light, transparency, diffusion, and colours of bodies. Here (pp. 11, 12) we first meet a passage of interest in connexion with our subject:—"The various principles enunciated above account for the facts relative to the colour of bodies and to their transparency, independently of every theory. Newton^{*} proposed an explanation of colours by the phenomenon of thin layers, which supposes that the particles of translucent or opaque bodies are transparent enough for the incident light to experience reflexions, both on its entry and on its departure. After this hypothesis, and following the undulatory theory, the colours of translucent media, supposing that all the particles have the same dimensions,[†] would be explained, by an effect of interference, as follows: If, in a homogeneous medium, there is a body of an infinitely small thickness into which light penetrates, and,

if the rays are reflected on entering and on going out, the difference of path is zero, but, by the fact of the difference of reflexion of the two rays, one is half an undulation behind the other; the two rays then destroy one another, and one can say that there is no reflexion, and that the totality of the light is transmitted. When the body has a sensible thickness, then the difference of path is greater, the destruction of the bundle less complete, and the thickness increasing. A moment arrives when the differences of the distances described is half a wave-length, and, when the 'lag' (*retard*) of the two rays, by the fact of reflexion in two planes at right angles, is a complete wave-length, then the maximum of clearness by reflexion is obtained. It is seen that the rays whose wave-length is the shortest, namely, the violet and blue, will be the first reflected in greater abundance, and, consequently, will be the first to lack for transmission; the tint of the translucent medium must then appear that of the rays of greater wavelength, that is, yellow or red, by transmission.

"This hypothesis alone cannot explain the observed effects of colouration, for the absorption of light by bodies depends on the nature of the latter, and, as we have seen before, each of them absorbs different parts of the solar spectrum, the colouration then of translucent or turbid (*troubles*) media does not depend only on an interference-phenomenon. . . ."

The first book (pp. 15-44) deals with calorific effects; the second (pp. 45-166) with chemical effects;^{*} the third (pp. 167-234) with photography;[†] the fourth (pp. 235-300) with physiological effects (on vegetables and animals); and the fifth (pp. 301-372) treats of vision. At present, the fourth chapter of Book iii., on the reproduction of colours by the action of light, chiefly interests us (pp. 209-234). The chapter is divided into sections.[‡] We will now study his work as presented in its final (book) form by comparing it with a description of his methods and results written eleven years previously. We shall thus be able to appreciate better any advances he made in that time, and more particularly any new suggestions he may have made in explanation^{||} of the observed phenomena. Then we shall be able to conclude if, *in this part of his work*, Becquerel had any influence on the very discontinuous train of thought which led to the discovery of interference-photochromy.

We will, then, compare this fourth chapter—"Reproduction des couleurs par l'action de la Lumière—with his *Exposé* of 1857.[¶]

After mentioning Seebeck, Herschel, and Hunt, Becquerel reproduced, almost word for word, the first part of the *Exposé* (from p. 293, line 11 up, first column, to p. 294, line 3, in the below-cited translation). The essential alterations are as follows (which brings us to the end of the first section):—

P. 293, column 2, line 8 up, after "colourings," add: "Another chloride, such as the chloride of potassium, of strontium, &c., substituted for the sodium chloride, gives the same results, and the base of the alkaline salt has no action on the compound of silver formed. The silver-layers must be of great purity, and even previously heated to 300° or 400° C. if they have been already used for experiments with mercurial vapours, then carefully *décappés*, for this process brings out"

P. 294, after line 3, add from line 13 up, p. 212 to line 20, p. 213

* General effects of differently refrangible rays. Electric effects produced under the influence of the chemical action of light. Comparison between the intensities of rays of various luminous sources. Extinction of active rays.

† Daguerreotype.—Photography on paper, collodion, albumen, gelatine, &c. Photo-engraving, photo-lithography. Reproduction of colours by the action of light.

‡ § i. Preparation of the sensitive layer. Sub-chloride of silver. § ii. Modification produced by heat and infra-red rays on the sensitive layer. § iii. Effects produced by differently refrangible rays; solar spectrum, uncoloured and coloured screens. § iv. Reproduction of coloured camera-images and of coloured engravings. § v. Alteration of the coloured photographic images produced by sub-chloride of silver in the light.

|| This word must not be misunderstood. The only real meaning it can have is the furnishing of a deductive process by which it might have been discovered, without experiments, from a fact or theory already known.

¶ Full translation in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1899, 292-294 and 309-311. On p. 293, column 2, line 11, read "appreciable : in the violet;" line 18, for "should be" read "is;" line 19, for "where" read "either;" line 20, for "as where" read "or;" line 22, for "sensitive" read "visible;" line 27, for "silver-black" read "layer of silver." The other misprints are trifling, and cannot present any difficulty to the reader.

^{*} *Traité d'Optique*, livre 2, 3^e partie.

[†] Brücke, *Pogg. Ann.*, lxxxviii., 1852, 63.

of Becquerel's volume; and after line 13, see Becquerel, p. 214, line 24, and so on. On p. 217, Becquerel referred to Poitevin.*

In section 2, the modification sketched in the translation (from line 20 up, column 1, p. 310 to line 23, column 2) was described in greater detail. In section 3, the effects produced by the various parts of the luminous spectrum were examined; the sensitive surfaces being (1) not heated, and (2) heated, and (3) submitted to the action of the extreme red rays; also by uncoloured and coloured screens (q. v., and also section 4).

The fifth section is closed by a possible explanation† of the effects:—

"How are we to explain in the actual state of science the effects of colouration of the photographic images with the natural colours of the active rays? We have seen in the preceding book that the sub-chloride of silver when it changes gives rise to an electric current which can easily be detected; now, this current has always the same direction whatever may be the active luminous ray and the colouration of the matter; this circumstance, joined to the production of the uniform grey tint which the substance takes in all rays when the action is sufficiently prolonged, shows that the hypothesis of as many different reactions as there are spectral colours cannot be admitted. There is chemical transformation of the impressionable matter, and at the same time, temporarily, different physical state of this matter according to the refrangibility of the active rays."

"As light is the result of vibrations transmitted from the luminous bodies to the retina, and as each ray of the spectrum corresponds to a different frequency of vibration, it may be that the sensitive substance, which has been acted upon by a ray, that is to say, by vibrations of a certain frequency, acquires the faculty of vibrating more easily afterwards under the action of vibrations of the same frequency as that of this ray. Thus there would be produced in this circumstance the same phenomenon as that which occurs when a reunion of sounds strikes a stretched cord; only the sounds of the same tone (*hauteur*) as that rendered by the cord put the latter in vibration. . . ."

"But how is it that other substances chemically sensitive do not give rise to analogous effects, and that only the substance whose preparation I have indicated has (for the present) this faculty of preserving the imprints of the active luminous rays? Further researches will perhaps show this."

We must conclude, then, that no hint was given *here* from which an *interference* theory could be built up. *But* the passage quoted from the "Préliminaires," might afford some grounds for the beginning of a train of speculation, which might end, as with Zenker, in a natural *explanation*, or, as with Lippmann, in a *method*. However, whilst we can affirm that Edmond Becquerel, in his final presentation of his researches, did not in any degree call to his aid an interference method as explanation of *them* (and, indeed, stated most positively, as we have seen before, that it is *not* by an action of the kind which gives place to the phenomena of thin layers that the substance reproduces the coloured impression of light), there still remains a possibility that he was led to such an explanation at an earlier period of his investigations. In any case it will be interesting to trace the course of his thoughts and researches from the beginning. This we propose to do later, but next we will turn our attention to Lord Rayleigh.

PHILIP E. B. JOURDAIN.

Cambridge, October 11, 1900.

THE PHOTOGRAPHER'S YEAR: NOVEMBER.

OUTDOOR photography in November! Why, the thing is absurd! What is there to take? As Hood put it—

No sun, no moon;
No morn, no noon;
No dawn, no dusk; no proper time of day;
No sky, no earthly view;
No distance looking blue.
No road, no street, no t'other side the way;
No end to any row;

* *Compt. Rend.*, LXI. (1865), 1111.

† Pp. 232, 233.

‡ In the original the word is *vitesse*.

No indication where the crescents go;
No top to any steeple;
No recognition of familiar people.

* * * * *
No shade, no shine, no butterflies, no bees;
No fruits, no flowers, no birds, no leaves—
November!"

Miry ways; bare, dripping hedges; a dank, unwholesome earth, perspiring generally in thick fog, under the dullest of low-lying, leaden-coloured skies! It certainly needs something of a Mark Tapley temperament not to lay the camera by for a while. But granted his philosophical dash of optimism, things do not look quite so hopeless. The consciousness of possessing the optimism is in itself a good deal. The feeling of being ahead of other men is as pleasant on a country road in November as it is at being one of the few persons not sea-sick on a water trip in summer. Both may be merely due to a full—but not over-full—supply of gastric juice and bile. If so, it makes no difference. It is men of high vitality, with a correctly balanced arrangement of physical organs working at their best, that are wanted everywhere, but particularly, we claim, in photography. Anything disagreeable that a dyspeptic or bilious subject may say or do in the ordinary conduct of life, as the result of his improperly acting functions is confined to a narrow circle; but when he comes to recording his peculiarities in a picture, ill effects are spread over a far wider area. There is a fatal ease about the photographic process that emphasizes the mischief. An artist suffering from a bilious attack is more handicapped. The expression of his perverted or pessimist ideas takes so much effort to carry out that the associated lack of energy acts as a judicious check; or if he manages to get up a spasmodic spurt by the time he is half through the work a correcting dose of calomel may have stirred up his liver to proper working point, and at the same time cleared his brain to such purpose that he throws the unfinished canvas on the fire. The photographer, with less labour, and in a fractional part of the time, will have finished his picture, and the mischief is done. We are familiar enough with it, and its muddy tones, foggy lights, and out-of-focus effects. "Strivings after artistic expression" is one euphemistic way of describing it; effects of biliousness is another, and more common-sense one. It is a great pity that excess of bile does not totally arrest the action of the brain for the time being, instead of perverting it. How much happier would we not be all round!

This depressing type of photographer is the one who can see nothing in November; who, in spite of all statistics to the contrary, believes it to be the month of suicides. Small praise to him who can only be happy and cheerful when the sun shines. It is he who rises superior to unfavourable external conditions, who even makes them minister to the inward content upon which happiness really depends, that we like to come across. Upon him November's photographic appeal is not lost. He is a proportionate man mentally as well as physically, and knows there must be rainy days in life, or there would be no life and sunshine at all. Possessed with this philosophical belief, he does not grumble at a wet day, but, knowing it to be inevitable and essential, soon gets to notice points of attraction in a wet, foggy, dull landscape that would otherwise have escaped attention. If practicable, it is not pleasant, to take a camera out in a rainstorm; but it is very practicable to photograph the effects of rain. Bare, wet trees standing in flooded meadows, the waving current lines on the face of the river itself; its heaped up rush over a mill dam, a droop-eared horse or group of sheep with sodden fleeces—these are all photographable. They will possess the adventitious charm of being as yet rather unusual, and always act as excellent foils to fair-weather pictures of summer.

Let the worker apply it more closely by asking himself whether he is not rather tired of the disproportion of orthodox summer pictures, soft sunny skies and seas, mellow landscapes, cattle knee-deep in shaded brooks, and so on; and is not ready to turn with pleasure to the contrast afforded by less smiling scenes. We need tonics now and again, and these generally have an agreeable sharp or bitter twang about them.

Probably the reason for there being so few November pictures is in a great measure due to the assumption that because there are fewer photographic possibilities in the month there are none. If the wise man who continues his walks abroad in November will but keep his eyes open for them, he will see plenty, and, in addition, have the walk much brightened by having a pleasant and definite object to exercise his mind upon. The light is bad from a photographic point of view, it must be admitted, but we may be certain that it is right from Nature's.

She elects to fit grey skies to dull landscapes, and it would be as much out of place as useless to long for other conditions, July sunshine to light up a November scene. In practice, with the rapid plates and wide-apertured lenses that we have at command, there can be no great difficulty with the technical side on the very dullest days.

Opportunities are not limited to the country, although there is stronger attraction in the greater ease and freedom in working there. Pitching a tripod to command a view of a winter torrent is a more agreeable matter to a shy and thin-skinned worker than doing so in a town street, with its floating scum of idlers always ready to congregate and indulge in caustic comment. Very good effects are possible, however, with a good hand camera, and a long-focussed lens. There is an artistic charm, that Hood was not open to, in there being—

"No end to any row;
No indication where the crescents go."

The suggestion of crowded size is more deeply, because vaguely, suggested in such a picture than in a clear-cut one at another season in which the houses can be counted. The city is even more strongly opposed to the country in November than in June. Then there are telling little scraps peculiar to the town, and particularly to the town in November. The crossing-sweeper is there in his full glory, and a dull day sets off well the labourers congregated around the brazier of live coals, whilst the plumbers are setting to rights the pipe just laid bare. In November, too, come the municipal elections and mayoral processions, with their wealth of telling and characteristic figure and incident. This also, we are constrained to admit, is work for the full-blooded, healthy man. And one with a ready smile, as much for the selection of happy and cheerful material as the reception of his presence and object by the great unwashed.

The value of the great majority of photographs is not due, by any means, to their worth judged by a hard and fast artistic standard, but by the associations connected with them; otherwise to the degree they touch and express the personality of the one who took them. A man who goes photographing in November shows in the very fact a stronger individuality than he who does not. Further, as subjects are fewer and harder to gain, he is less likely to waste effort in taking anything that does not strongly appeal to him. It is not a summer matter of "having a shot, anyway," in a hesitating and half-hearted way. Between these psychological considerations that hook themselves unconsciously on to the question, it is very likely that pictures taken in the least favourable month, under the most adverse conditions, will be more highly prized than those taken under opposite favourable ones. They are more likely to possess a human, as opposed to an artistic, excellence; and when it comes to a question of which of these is the stronger, there can be little doubt as to the answer.

If the photographer run not to necessary brawn, but more high-strung and nervous, have, like Mr. Pell, "brains all over his body," there is nothing for it but to stay indoors, find fault with the weather through the parlour window, and look over his summer negatives. With all fitting respect for him, we elect for the open air, in common, we trust, with many heartier and happier fellow-workers.

RETOUCHING WITH A KNIFE.

In answer to several inquiries from correspondents in regard to the use of the knife in retouching, a few remarks from a practical worker may be of some assistance. In the first place, a good knife is necessary, and I know of nothing better than what is called a microscopic dissecting knife. It is best to have two for use—one rather broad towards the point, the other tapering to a point almost as fine as a pen. The broad one can be used to remove large masses, such as objectionable parts in a lady's dress, &c.; while the smaller one is very useful in removing false lights in the eyes, stray hairs protruding from the hair or beard, blemishes in the face, protruding bones in the neck, reducing the size of the hands and wrists, &c. In the next place a proper edge is desirable, because without this it is impossible to use the knife satisfactorily. For this purpose I find that a piece of Arkansas stone answers well. It should be used with a little oil. Care is necessary, however, when sharpening the knife, not to get a saw edge, as it is impossible to effectively use it when this is the case. To obviate this, hold the knife rather flat on the stone while rubbing, bearing rather lightly, and be sure to sharpen both sides as equally as possible. Always rub the parts of the negative on which you wish to use the knife with the retouching medium, because if this is neglected

you are liable to scrape deeper than is necessary. It is also advisable to test the edge of the knife on some part of the negative, which is not to be printed from. Sometimes, owing to negatives being of a slight yellowish colour, those parts which have been scraped will appear too transparent when varnished. This can be remedied by using a very finely-pointed lead, and going over those parts just lightly enough to fill in where the knife has cut too deep.

C. SCHERHOLZ.

PHOTOGRAPHY AS APPLIED TO THE REGISTER OF SASINES.

[A paper read before the Edinburgh Photographic Society by the President.]

I PASS on to bring before you a matter of no small public importance, and one which to us, as a Photographic Society, has a very special interest. I refer to the Land Registration Bill for Scotland, described in the Act of Parliament as a Bill to Improve the System of Registration of Writs relating to Heritable Property in Scotland. The Bill was introduced by the Lord Advocate and Mr. Anstruther. It was read a first time in the late Parliament. There is much in the Bill that is of great importance only to those immediately concerned, but which is in no degree interesting to us as photographers. I will therefore only call your attention to that portion in which photography is specially referred to. By it a radical change is proposed in copying all writs sent into the Sasine Office. Provisions are taken in the Bill to set up under Government a Photographic Department in Edinburgh, entailing an annual expenditure of £14,000, involving as it does the taking of about 200,000 negatives 16 by 10, and reproducing them by zincography. The present system, so far as it is intended to be superseded by photography, employs many whose pecuniary interests are adversely affected, and some authorities even in the Register House are not sufficiently convinced of the superiority of the process to give it their approval. There are differences of opinion, both as regards its practicability and its usefulness. Under these circumstances, I thought the Bill was of such importance that I have ventured to bring it before you to-night. I will first devote a few minutes to the present system and the work it is proposed to supersede. When heritable property changes hands in Scotland, or is bonded in security for debt, the transaction is written down on large folio paper, and duly signed and stamped. This document, or writ, as it is then called, is sent to the Sasine Office in the Register House for registration or preservation. These writs are bulky documents, and contain on an average three pages of closely-written matter. Their number has been increasing rapidly of late years. Many large estates are being broken up and sold in small portions, and a considerable amount of feuing is taking place in the neighbourhood of all our cities. The average number in 1887 was 27,537, and in 1896, 43,053 were presented. It will be quite safe for the purposes of this Bill to estimate the number now at about 45,000. These writs are all carefully copied, letter for letter, into a bound volume, and the utmost care is taken that the work done is an exact copy of the original deed. It is this copying process we have to do with. At present, to ensure such extreme correctness, when the work is done the writer reads it over to an official clerk who is looking on the writ. Then it is again read over by another official to another looking on. Every copy is therefore compared, or collated, as it is called, twice with the original document before it is accepted by the Keeper and passed into the archives of the Register House. The harassing nature of this work will be understood from the following extract from the Report by Lord Low's Committee in 1897, when it was proposed to print the records:—"The engrossed copy of every writ is collated twice with the original writ. The amount of labour involved is shown by the fact that in a year the amount to be collated twice is about 250,000 pages of 200 words each, or, including both collations, 100,000,000 words. The immense amount of collating done, and which experience has shown to be as little as is compatible with complete accuracy, is a serious matter. Everyone connected with the Register of Sasines spoke strongly of the wearing nature of the work and of the mental and physical strain which is felt by those engaged in it." Mr. J. Hope Finlay, the Keeper of Sasines, also in his Report in 1890 refers to the "wear and tear on the eyes and brains of educated men entailed by the double collating." The work of engrossing the writs or copying them by hand is at best a slow process, and may easily fall behind on any sudden increase in the number of writs, and so cause great inconvenience to the public. Printing has been suggested, but there are several serious objections to that method of copying the writs. The labour of collating is rather increased,

for whatever extra proof-reading the printer might adopt, the Keeper would not accept the printed records as official documents until they were twice collated by his own staff. The writers, I may explain, are not on the salaried staff: they are paid so much for every page, including collating. As they at present help in the collating, if they are done away with by printing, then the salaried staff would have to be largely increased, more than doubled, an objection which the Keeper sums up in his report by stating: "But the important point is that not only would printing largely increase the work of the salaried staff, but the increase would be in that branch which is least intellectual and most wearing out and tedious." Another objection is that, as these writs are large documents closely written on both sides, they could not be unstitched and handed over to the tender mercies of the printer. A copy would, therefore, need to be made for him, and so our objections begin all over again. Finally, and I think most crushingly of all, the cost would be enormously increased. Estimates were obtained from a number of leading printers, and it was found that the total cost of printing would be considerably more than double that of engrossing. Under these circumstances, Mr. Hope Finlay, wishing, if possible, to lessen the labour of collating, resolved to try what could be done with the photo-zincographic process, which had been proposed in 1866. So many improvements have been made since then that it might prove quite suitable now for his purpose. On this point I will quote from the notes by the Keeper for the consideration of the Committee of Inquiry:—"Enormous improvements in all the branches of photography have taken place since 1866, not only in application and adaptation, but in rapidity and economy of production." "In his opinion the result of the information he has obtained shows that it is now quite feasible to photo-lithograph the register; that in producing a perfectly accurate record and in overcoming the present delays in the return of writs to agents, the process would be a distinct improvement; that in cost it would not exceed the present system of manuscript, and that it would supersede the necessity for any collating, except such a general examination of the sufficiency of photo facsimiles as experience showed to be necessary or desirable. In describing the process, and in other particulars, the Keeper is quoting the information he has obtained from Mr. George Clulow, manager of Sir Joseph Causton & Sons, printing, lithography, and stationery contractors, London. Mr. Clulow has not only been in correspondence with the Keeper, but he has been two or three times in Edinburgh in the Register House. He has seen piles of writs to be dealt with. He knows their description, their number, and the extra pressure at certain seasons. His business is to consider and enter into contracts requiring organisation and efficient arrangement on a large scale, and his deliberate opinion is that the scheme is not only feasible but would be a success." As an experiment, the county of Fife was selected, and the whole writs presented for a month were photo-lithographed and bound as they would be if the process was adopted. Mr. Hope Finlay was kind enough to lend me a copy of that book, and I will be glad to let you examine it after I have finished reading my paper. Should the Bill become law, the process will probably be carried out as follows:—Premises will be obtained in St. James's-square, in the new building for the Sasine Office. There would be two floors, each about 100 feet long by 40 feet wide—the upper, lighted by a glass roof, to contain the cameras, developing room, sinks, &c.; and the lower floor, of the same size, for the printing presses, &c. In the workroom twelve cameras would be provided for times of pressure, though ten would suffice for ordinary occasions. Such an establishment would be capable of taking 600 negatives and 9,000 prints per day. The method of procedure would be thus: When a writ was received at the Register House, it would be taken to the photographing department, where it would be unstitched by girls, taken separate, and each page pressed smooth against a sheet of glass, then exposed under the electric light to the camera, again put together and stitched up. At no time is the writ out of the custody or withdrawn from the observation of an official of the Sasine Office. The room where the girls work would be entirely divided off from the rest of the workroom by a partition, through windows in which they would expose the writs to the photographers. On the other side of the partition the contractor would begin his work by taking a negative the exact size of the deed. This, to save making another negative, he would do through a reversing prism. The negative is then printed off by electric light upon a sheet of chemically-prepared zinc. The zinc plate is then treated with acidulated water, which leaves in relief all those portions which it is intended should be printed. The whole process is an extremely simple one, and is capable of producing as many copies as may be wanted, which could be supplied

at a nominal cost to the public if ordered when the writ is sent in. These copies would contain exact facsimiles of all the signatures, and would also contain exact copies of any plans attached to the writs. Copies would also be sent to the county towns of all the writs sent in from that county, where they would be much more convenient for reference than the printed extracts which are at present sent. The whole process would be completed in one day—that is, the photo-zincograph would be ready for binding the day after the writ was ready for the photographer. The permanency of the copies is vouched for by Mr. Clulow, who states that the oldest printed books we have are 450 years old, and that the photo-zincographs would last at least five times longer than that; also they would be more permanent than the original writs, and would stand tests which the original would not. The Government Survey Department at Southampton report with reference to the Survey Maps reproduced by a process essentially the same as the one under consideration, that "as to stability, the Doomsday Book and National Manuscripts reproduced by photo-zincography have now been in existence some thirty years, and show no signs of deterioration; there is, so far as known, no test of longer duration, but no failure in that respect is anticipated." The paper used would be of the best quality obtainable, water-marked with the Thistle and Crown, and the words, "Public Records of Scotland." The ink would be composed of carbon and oil. The greatest objection against the process seems to be on account of the touching up by which the operator might wish to make good any defect in the negatives or zinc plates. Mr. Matthew Livingstone, Deputy-Keeper of the Records, in his Report states: "It is believed that no process of photography or photo-lithography has yet been so perfected that the necessity of 'touching up' at one or more stages can be dispensed with. No degree of skill or intelligence on the part of the operator will ensure that the words or letters 'touched up' may not—quite unconsciously and unintentionally—be made to read differently, and to convey quite another meaning from that presented to the professional reader of the deed." Lord Low's Committee report: "We were specially careful to inquire into the possibility of tampering with or touching up the plates. Nothing of the kind is necessary. A workman might, no doubt, feel tempted to touch up a blurred or indistinct word, but we think any risk of this kind could quite easily be met by the supervision of the Sasine staff, under rules to be approved by the Court of Session." Mr. Hope Finlay states: "The negatives could not be tampered with without detection, but the photo-lithographic transfer on stone might be tampered with." But Mr. Clulow points out that under the regulations which would be framed "such a tampering would become a crime, and be dealt with as forgery." In the volume which I have here there are 502 photo-lithographed pages, in the production of which no touching up was allowed. Examining these simply from the standpoint of whether they would be accepted as a copy for the purpose of the record, the Keeper of the General Register of Sasines considers that there are 459 satisfactory pages, 31 indifferent pages, and 12 inferior pages which he would have rejected. He does not consider there is any danger to be apprehended from touching up; any accidental inferior pages would just be rejected and destroyed, to be replaced by proper copies.

With regard to the cost, Mr. Clulow's estimate of the rough cost of the suitable equipment of the department to do what is required with regularity and without hitch by any breakdown is £2600. Allowing for fifteen copies per writ, he states that the cost, beyond any question, would come within the figures £10,000 or £11,000—the present cost of engrossing and collating the record. Adding the cost of all the clerks required, as well as the equivalent for the time occupied by the district staff in examining the proofs, the cost of framing the register by each of the three systems is thus:—

Total cost of engrossing and collating	£10,670
Cost of photo-zincography and examination	14,000
Total cost of printing and collating	24,325

It is pleasant to be able to add that provision is made in the Bill for compensation to the engrossing clerks, many of whom have spent long years in their present employment.

J. C. LENNIE.

PETZVAL'S ORTHOSCOPE.

[Translated from the "Jahrbuch fur Photographie und Reproductionstechnik."]

THE construction of the orthoscope by Professor Petzval, of Vienna, represents an important period in the history of the development of

photographic optics (see Eder's "Anschrift Handbuch der Photographie," 2nd edition, vol. 1, part 2, p. 43), and is more particularly described by Dr. von Rohr in his excellent work, "The Theory and History of the Photographic Objective," published in 1899. But concerning the form in which it was constructed by Petzval in 1857 by the optician Dietzler, of Vienna, we have little exact information, as the data given by Voigtlander, in his controversy with Petzval, differ from those in Petzval's patent specification, as well as the orthoscopes actually made.

It is therefore a matter of considerable interest that Petzval's original patent specification, concerning his orthoscope introduced in 1857, should be published, and I append an exact copy of this hitherto unknown document, which is preserved in the archives of the Austrian Patent Office, Vienna.

No. 10,570 (open).—Vol. VI., fol. 315.

Patent Specification by Karl Dietzler. 1 specification, 1 drawing—367. (Z. 9896/1273.)

"N. 2738 (open).—

"Description A.—An invention by Professor Josef Petzval of a new objective for the camera obscura, by means of which a desirable curvature of image, better and more equal definition and illumination in all parts of the field are attained. With a small diameter of lens the size of the image is considerably increased, and the same efficiency is thus secured at much less cost. 10570/0. Vienna, the 6th October, 1857. (Granted, 28/12/857.)

"Ex. 8 October, 1857. The duty of 20 gulden in current coin has been deposited at the Imperial Royal Treasury for the district.—Knab, M.P.

"(Signed) CARL DIETZLER, M.P., Mechanician and Optician, Vienna. Wieden No. 102. A 26793. XI."

The following patent specification by Petzval is appended to this document:—

"10570/0.

"Patent Specification.—The new objective is composed of two achromatic lenses, of which the first, as well as the second, is formed of two components, namely, a crown glass lens and a flint glass lens combined. The crown glass component of the first lens is biconvex, with the flatter curve outwards, whilst the more convex surface exactly fits the flint glass lens, and is cemented to it. This flint glass lens is biconcave, with the second surface of very slight curvature, so that the entire lens, achromatized by the combination, is almost plano-convex in form. Strictly speaking, however, the outer surface is decidedly convex, whilst the inner is slightly concave. The exact form is given in the drawing.

"The second achromatic lens, formed of a front crown glass, and a back flint glass component, may be at a distance of 1-12 to 1-16 of the focus of the first lens, according to the purpose for which the objective is used, and is of somewhat smaller aperture than the first achromatic lens. The crown glass component is biconcave. Its deeper curve is turned towards the front achromatic lens, whilst its lesser curve is turned towards the interior of the apparatus. The second flint glass component is concavo-convex. Its convex surface is turned towards the interior of the camera, and its position and dimensions are given in the drawings. It is not essential that a scale should be given for the drawing, as the combination may be made of any size, provided it be strictly similar in construction, and it is thus capable of giving images of various dimensions, which are always of excellent quality.

"(Signed) JOSEPH PETZVAL, Professor at the Imperial Royal University."

An exact drawing of the construction of Petzval's orthoscope is appended to the document.

In conclusion, I would remark that Petzval's patent was not a secret one (as understood under the old Austrian Patent Law), but "open." It, therefore, follows that Petzval did not wish to make any secret of his invention, but nevertheless he did not offer facilities for its publication.

DR. J. M. EDER.

This article by Dr. Eder is very interesting historically and scientifically, as may be seen from Dr. Moritz von Rohr's recent work. It is there stated that a patent agent had searched for the patent, but that no such document could be found. Dr. von Rohr adds that he had since discovered, by accident, that the patent was granted to C. Dietzler on the 28th December, 1857. Perhaps this remark led Dr. Eder to make further inquiries, for the above is evidently the document in question. The importance of the discovery lies in the drawing, which accompanies the document. This is reproduced in Eder's "Jahrbuch," but it is remarkable that the drawing, as reproduced, does not correspond with the specification, for the bi-concave lens of the back combination has its flatter side turned towards the front lens. On the

other hand, Dr. von Rohr's drawing of the lens, from data supplied by Fr. Voigtlander, corresponds with the Dietzler patent. Owing to a dispute, Petzval separated his connection with Voigtlander, and made an arrangement with Dietzler for the introduction of this lens. But Voigtlander had been given particulars in 1840, and he manufactured the lens in competition with Dietzler. It is curious to notice that the Voigtlander type has the flatter side of the bi-concave lens turned towards the front combination, as in the drawing attached to the Dietzler patent, but the back combination of the Dietzler type is smaller than Voigtlander's.—Translator.

SOME DIFFICULTIES OF CARBON PRINTING.

At the Photographic Club on October 17, Mr. E. W. Foxlee addressed the meeting on the subject of "Some Difficulties of Carbon Printing." He thought he had been badly chosen to speak on the difficulties of the carbon process, as for many years he had not experienced any, unless it was in this room, a couple of years ago, when he could not get water sufficiently hot to serve his purpose.

The sensitising of the tissue is by some considered a difficult matter, and especially the subsequent drying of the tissue. Text books tell us that it should be dried in a perfectly pure atmosphere, and we know that the fumes of gas have a tendency to render the tissue insoluble, and that in the very place where it should not be insoluble—viz., on the surface of the tissue. He remembered the case of a whole roomful of tissue turning out insoluble through being dried in a room where gas was burning at the time. The want of a suitable drying-place was felt by many who sensitised their own tissue. Should the tissue be too slowly dried it will turn out insoluble; wherefore one must contrive that it shall take only a moderate time. In a small way, however, there was no difficulty about sensitising and drying tissue in an ordinary room. A dark room was not by any means essential. For sizes up to about 24 by 18 the way to proceed was to sensitise the tissue in daylight, because sensitiveness to light did not arise until the tissue is dried. The tissue may then be squeegeed on ferrotype plate, ebonite, or zinc, and stood against a wall to dry. The support will protect the surface altogether from the action of light, and the paper itself, stained with the bichromate, is quite sufficient to do the same from the exposed side, even in a fairly strong light. A dark room was, therefore, unnecessary either for sensitising or drying. The tissue when stripped is perfectly flat, and another advantage is that no dust has been able to reach the printing surface. The dry tissue is, of course, sensitive to light, but with care it may be handled in an ordinary room. After printing, if the tissue be removed from the frame and immersed directly in cold water, it becomes at once insensitive, and so we advance another stage, without recourse to a dark room. The carbon process may therefore be quite legitimately styled a daylight process. The next difficulty may be that the tissue will not adhere to the support, or, if it does, will not strip in hot water. This shows that the tissue is insoluble, and it is always advisable beforehand to test the tissue, and see if it be in working condition. A piece of tissue should be soaked in cold water for a few minutes, and then placed in water at about 105°. If the coating dissolve off in ten minutes, it is all right. If not, it may be thrown away. The simplest method for any carbon worker to adopt is to buy his tissue ready sensitised. Such tissue will keep good for three weeks or a month. It sometimes occurs that blisters manifest themselves during development. These often are due to improper squeegeeing. The correct way is to bring the tissue and the support, final or temporary, together under the water, and then, with a firm stroke, pass the squeegee downwards, commencing about one-third from the top. The tissue and support are then turned round, the operation repeated. No air bubbles can then remain; but if one starts from the middle of the print, it generally happens that blisters result.

Development will show whether exposure is correct or not. If under-exposed, the paper will too readily come away, and the details of the picture will appear very quickly. The print may be saved by transfer to colder water. If over-exposed, there may be a difficulty in stripping. In bad cases, it is quite impossible to get the paper off, but sometimes the picture may be saved by the use of hotter water, and the allowance of a longer time for development. There are cases when the ordinary safe edge necessary in carbon printing fails to prevent frilling, notably where a very deep shadow adjoins the safe edge. In such cases it will be better to put the black varnish safe edge on the reverse side, so that the light in printing penetrates under it. Very much in the way of faking may be done during development of a carbon print. To brighten up a part, apply a stream of hot water locally. On the other hand, parts may be kept back by the use of cold water. By working in both ways considerable "improvement" can be effected. Mr. Foxlee laid considerable emphasis upon the utility of a hot and cold water supply to carbon workers. At the present time most houses, he thought, were now furnished in this way. Reference was made to troubles in the double transfer process arising from imperfect waxing of the temporary support. The remedy, of course, is obvious. Tissue is in the best condition for use about a

week after it has been sensitised, or two or three days for home sensitised tissue, which does not keep so well as that sensitised in the making. When a very hard negative is being printed, it is best to expose the print for a few seconds after removal from the frame, and before putting into water. This will produce a slightly insoluble layer on the surface that will cause the lights to hold, but will not degrade them. In reply to a question, Mr. Foxlee said that if the tissue is to be squeegeed after sensitising the solution should be somewhat stronger than if the tissue were allowed to dry spontaneously. Strong black and white negatives are best printed on tissue sensitised in strong solution, and weak negatives in a weak bath. After a short, chatty discussion, a vote of thanks to Mr. Foxlee closed the meeting.

THE REGISTRATION OF PHOTOGRAPHS.

[In deference to the wishes of many correspondents, we reprint from the JOURNAL of September 28 our regulations for the registration of photographs.]

At the head of our weekly Answers to Correspondents it may very often be noticed that a list is given of photographs registered. There are one or two misconceptions prevalent with regard to this matter, which we take this opportunity of removing. In the first place, the announcements relate only to photographs which we ourselves have registered for the convenience of our readers. Secondly, they have no reference whatever to or connection with the official register at Stationers' Hall. Thirdly, they are merely records of registration that we have effected, and they have no legal significance at all, being of the nature of informal receipts only.

It has occurred to us that our readers at large may be usefully reminded that, for their convenience in the matter, and especially that of photographers living at a distance from London, our publishers undertake the registration at Stationers' Hall of copyright photographs. For the guidance of those unfamiliar with the necessary procedure, we here state what is required in order to effect registration through THE BRITISH JOURNAL OF PHOTOGRAPHY.

1. Send us two unmounted copies of the photograph to be registered, with a postal order for one shilling and sevenpence.
2. On receipt of these our publishers will forward the photographer a registration form, which he must fill up and return to them.
3. Address all communications on the subject to Messrs. Henry Greenwood & Co., 24, Wellington-street, Strand, London. The fee of one shilling and sevenpence covers the cost of registration (1s.), form (1d.), postage and expenses.

PHOTOGRAPHY WITH FILMS.

At the last meeting of the Croydon Camera Club, Mr. S. H. Wratten in the chair, the President, Mr. Hector Maclean, F.R.P.S., &c., drew what seemed to be the largest attendance of the present season, when he gave an address, which extended over an hour, on "Film Photography." All were surprised to hear that film photography is older than the glass plate negative, Hill and others, in 1843, having used sensitised paper for producing calotypes. Later Warnerke, in 1876, introduced stripping films. But the greatest step of all was the perfecting of celluloid somewhere about 1888, when Carbutt drew attention to its availability for photographic purposes. Mr. Maclean gave particulars of various methods pursued in making transparent celluloid, and explained why certain kinds of celluloid were calculated to impair the rapidity and the efficiency of the silver emulsion. Although film photography had been growing very slowly in popularity, it had at length fairly caught on, due in great part to the exertions of such firms as Kodak & Co. and the makers of the Frena, and also to the teachings of the cinematograph, which, being entirely dependent on film photography, has thoroughly impressed amateurs and others with the suitability of celluloid films as a support of the sensitive emulsion. The great inventive boom noticeable within the past year, as regards various makes of photographic film, was dwelt on, and the structure and manipulation of the Wellington, the Thornton, and the Cristoid films described.

The question of keeping properties of film was carefully gone into. A sharp distinction was drawn between rollable celluloid film and other rollable film, or flat celluloid film. Several instances were cited of flat celluloid film being reasonably perfect after eight years' keeping.

As regards latitude, some films, such as Cristoid, had far more latitude than an ordinary glass plate. Some celluloid films, if flat, had a large latitude, as was evidenced by a set of five prints and negatives (by Mr. Bynoe) passed round, the latter of which had respectively received exposures on the same subject, and within five minutes of each other, of five, ten, forty, and eighty seconds. There was little to choose between the five.

In the course of the lecture several pieces of apparatus were shown and explained. They included the Panoram Kodak, lent by Mr.

Bishop, of George-street, the new No. 3 Pocket Kodak, and the Folding Frena, which last was immensely admired, combining, as it does, all the advantages of "forty flat films," and the option of using it as an ordinary pocket plate camera.

An ingenious film double back, made by the Sandell Plate Co., was also examined with much interest. It is entirely novel, and seems unusually efficient; it is exceedingly compact, and weighs when charged 2½ ounces.

Other examples of film apparatus were shown, including the Volvo Developing Wheel, a device for those who would like to develop their rollable film without having to dabble in solutions. Any length of film up to six or eight exposures can be attached to the periphery of a wheel, the lower portion of which is made to dip into the developing solution; the whole is slowly revolved until development is complete. After a rinse, the film is fixed by a similar procedure, and finally washed. It is from beginning to end unnecessary to touch the film or remove it from the wheel until it is dry. The above costs but a few shillings. In explaining various ways of developing films, Mr. Maclean dwelt on the need for large dishes and plenty of developing solution, given which a quantity of film exposures could be developed quicker than the like number of glass plates. He described the modus operandi from cutting off the picture from the spool (which some amateurs muffed) to drying the glycerined film on a board. Mr. Maclean, in response to a circular sent to all members of the Club, stated that it appeared that of those who replied over 80 per cent. used films, of whom 75 per cent. prefer films to plates, either entirely or for hand camera work.

THE NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

On October 23 the Annual Meeting of the Newcastle and Northern Counties Photographic Association was held at the Y.M.C.A. Buildings, Blackett-street. Mr. J. S. B. Bell occupied the chair.

Mr. W. T. Thompson read the report of the Council as follows:—The Association has probably had the busiest and most successful year since its formation in the season now concluded. Last winter's indoor meetings, almost without exception, drew large audiences, and the annual exhibition was very successful. The Association held an extra exhibition in March, consisting of the work of Mr. J. Craig Annan, of Glasgow, and on this occasion held a members' dinner, which was largely attended. It is to be desired that this dinner may become an annual event. Further, the Photographic Convention of the United Kingdom held its meeting in Newcastle under our Society's auspices, and the meeting proved one of the most successful gatherings in the history of the Convention. It may therefore be fairly concluded that two exhibitions, a dinner, and a Convention are favourable indications of our activity and prosperity as an association. The papers and lectures given last winter were nearly all by our own members, and proved that this is by far the most satisfactory method of filling our programme. As we have now once more secured the great advantages of permanent rooms, and a properly appointed dark room, it is hoped that members will induce others to join, and thus share in the advantages. The membership at date of report is 140.

The election of officers resulted as follows:—President, Mr. G. B. Bainbridge (re-elected); Vice-Presidents, Messrs. J. S. B. Bell, T. M. Clague, W. S. Corder, and J. P. Gibson; Council, Messrs. C. E. Barkas, Parker Brewis, W. E. Cowan, G. Elphick, A. B. Gardner, F. Park, W. Parry, G. L. Snowball, W. Thompson, and Dr. Blacklock; Treasurer, Mr. James Baty; Secretary, Mr. Godfrey Hastings, Station-road, Whitley Bay; Assistant Secretary, Mr. T. Bulman; Lanternists, Mr. J. J. Kirkwood and Mr. Edgar G. Lee.

Mr. Clague referred to the resignation of Mr. W. Thompson, of the office of Secretary, and said that gentleman had raised the Society to a level it had never before attained. He moved:—"That the Society desire to place on record its high appreciation of the services rendered by Mr. W. Thompson during the time he has been Secretary of the Society."

This was carried by acclamation, and the resolution will be placed on the minutes.

On the motion of Mr. W. S. Corder, a cordial vote of thanks was accorded Mr. Bainbridge for the manner in which he has fulfilled the duties of the presidency. Mr. Bainbridge had been a model President, and he well deserved the warmest thanks of the members of the society.

The motion was carried by acclamation.

Mr. James Baty (Treasurer) was also thanked for his services during the past year.

Our Editorial Table.

CATALOGUE RECEIVED.

S. H. Fry, 12, South-villas, Camden-square, N.W.

Mr. Fry's new catalogue has a thumb index which facilitates reference

to the various parts of the book. This is one of those little ideas which are appreciated by people who constantly require to look up prices and other details. It saves time, and anything which does that deserves our commendation. For the convenience of his clientele Mr. Fry has extended his list of special lines, and notifies that certain classes of work are delivered free. We have pleasure in reminding our readers that one of Mr. Fry's principal planks, if we may use the phrase, is that he confines his business operations to the supply of enlargements, printing, &c., to professional photographers and the trade only. In this sense, coupled with the always excellent qualities of his work, Mr. Fry makes a very strong bid for the support of our readers. In a special note Mr. Fry adds: "My Card Almanac for 1901, illustrated with carbon print entitled 'When Adam Delved' will be ready early in January, and will be forwarded free on application to bona-fide professional photographers." Now, Mr. Fry has set our curiosity astir with the title of his carbon print, and we shall be glad when January comes, so that we may learn the subject of this uncommonly named photograph. The couplet runs: "When Adam delved and Eve span, who was then the gentleman?" We wonder how a member of the new American school would fit a photograph to such a title?

THE AMERICAN ANNUAL OF PHOTOGRAPHY and Photographic Times Almanac for 1901 (published by The Scovill and Adams Co., New York) comes to us in a guise which differs from that of its predecessors, and perhaps is an improvement upon it. The new Editor, Mr. Juan C. Abel, has our congratulations upon the excellent work which he has done. Among the numerous illustrations the "New American School" is, of course, represented, the formulae and tables are full and useful, and the articles varied and interesting, if lacking in novelty of subject. Mr. J. T. Keiley contributes a lengthy paper entitled "Photography and Progress." He recounts some of the most recent scientific and other achievements of photography. He would have been well advised if he had not allowed his pen to lead him beyond the 54th page of his article, for the remainder of what he writes is a womanish wail that some modern writers, ourselves amongst them, do not take some three or four swollen-headed pictorial photographers at their own valuation. Mr. Keiley seems to seek solace in the reflection that history will repeat itself, and that he and his kind have only to wait, as Dr. Emerson did, to come into their own. But Dr. Emerson is not flattered at the comparison. It is true that that distinguished man met with much ridicule and opposition some ten or eleven years ago, but it was obvious to many people that time would clear all that away. For if Dr. Emerson started by destroying many fallacies, he also formulated a full and clear theory of pictorial or naturalistic photography, and backed it up by producing photographs which translated that theory into practice. And all through the piece it was pure anti-fake photography! Now, Mr. Keiley and his friends have gone a different way to work. Photography with them is not the end, but the excuse to produce results which have the least possible resemblance to a photograph as Emerson defined and produced it. They fake, they splodge with gum and glycerine, they "pose"; indulge in the small practices of mutual admiration; write wordy, windy screeds which defy analysis or comprehension, and generally comport themselves in a manner which makes it difficult for people to take them seriously. Even those who opposed Dr. Emerson respected and admired him for his sincerity, but Mr. Keiley and his fellow "martyrs" have so far only succeeded in causing us to laugh at them. The London agents for the book are Messrs. Dawbarn and Ward, Farringdon-avenue, E.C.

Studio Gossip.

PRICES in New Zealand.—"So we are coming down to popular prices; and penny pictures, or sixteen for a shilling is the latest fancy. They are wonderfully good value for the money," says a writer in "Sharland's New Zealand Photographer," "and when they give six different positions all for the same price, we are not surprised that those who cater for the millions on those terms are fairly rushed. Of course we cannot expect retouched proofs to be submitted, or any re-sitting if not approved. But for a 'Take it or leave it' sort of a game it's well worth the 'Bob.' I well remember some years ago when 'Tom Thumbs' or midgets were introduced at half-a-crown a dozen. A certain gallant gentleman—in fact, a 'modern Major-General'—descended to patronise a certain establishment for half-a-crown's worth, if you please. He wanted the choice of half a dozen different positions, proofs to be sent to him by post, and he would settle for them 'in account.' What a pity he was a little 'too previous.' If he had only waited till to-day he would have had his dearest wishes fully gratified."

LADIES' Dress in Photographic Portraiture.—An American contemporary quotes an American photographer as recommending ladies not to make their dress too modern and characteristic of the styles of the moment. Nothing makes a picture look so very much out of the mode as some costume of fifteen or twenty years ago, which may have been the smartest thing possible at that time. But fashions change so positively that few of them are tolerable to look at after a decade. On the other hand, a woman who has been photographed with only the head and bust revealed, will never give any sign of the passage of time in the appearance of the picture. She will not have the antiquated, out-of-date look that makes some photographs ridiculous. Puffed sleeves were worn only five years ago, but the picture of a woman taken in one of these dresses is really absurd. Even greater than the changes in the style of gowns is the difference that comes in hats.

Women who had their photographs taken in the style of bonnet worn fifteen years ago must feel like laughing at themselves now. Even jewellery has its effect, as the picture of a woman that I saw the other day very plainly showed. She had on an old-fashioned set of coral earings, bracelets, pin, and everything that used to belong to the "set." She was disfigured by these ornaments. Nobody would have thought of paying any attention to her face, as the coral jewellery absorbed all the attention of the spectator. It is for such reasons as this that I always tell women who want to continue satisfied with their pictures that they should have only the head and shoulders taken, and drape them with a lace scarf or something else that might have belonged to any time or period, and is not going to look absurdly out of fashion after a year or two. Extremely simple dress sometimes may accomplish the same purpose. But the light draping is always more certain. I can remember when women had a passion for being photographed in snowstorms. The heavier the storm the more they liked it, and the more closely they clutched the fur muffs they always carried in these pictures. It is only necessary to look at one of them now to realise how mistaken all such attempts at eccentric pictures are."

News and Notes.

THE Holland Fine Art Gallery has been removed from 235a, Regent-street, to more commodious premises at 14, Grafton-street, Bond-street, W.

ROYAL Photographic Society.—Lantern meeting, Tuesday, November 6th, at 66, Russell-square, at 8 p.m., "Cities and Sights of Spain," by Mrs. Aubrey Le Blond. The exhibition of American photographs at 66, Russell-square, closes November 8.

COMBINATION printing can be easily effected by using Thornton films for negatives. Two or three negatives can be made, say, one with clouds, one landscape, and one with figure; the negatives can then be laid one on top of the other in the required position, the films being so thin as not to interfere with the resultant print in any way. This was one of the many hints given by Mr. Walter D. Welford during his interesting demonstration of the Thornton films at the Woolwich Society on the 25th ult.

THE Local Technical Education Committee of Brigg, Lincolnshire, under the Lindsey County Council, decided last week to commence a course of lectures and demonstrations on "Chemistry as applied to Photography," and appointed Miss Breeze, Science Mistress at the Brigg Grammar School, to give the chemical and physical lectures, and Mr. J. Wilmore, of Brigg, to demonstrate the practical portions of the syllabus. Over 20 students have been enrolled in the class, and a successful session is anticipated.

UNDERWATER Photography.—The results of some experiments that have been made in under-water photography are given in an article published in the November number of "Pearson's Magazine." The experiments were carried out by two well-known zoologists, who have made a special study of the habits of fishes, and who have brought the camera to the aid of their investigations. M. Louis Boutan, of the Paris School of Zoology, has succeeded in taking some photographs under water by carrying a camera with him to the sea bottom, where he explored in diver's costume; whilst Dr. R. W. Shufeldt, of Washington, U.S.A., an American naturalist, has been experimenting for years past in photographing the fishes in the aquarium tanks of the United States Fish Commission Buildings in Washington. The experiments of these investigators are described at length in the November "Pearson's," and many of their photographs are reproduced, including one snap-shot which shows nearly 500 rainbow trout swimming in an aquarium tank.

SOCIETY of Arts.—The following are the arrangements for meetings during November and December:—Wednesday, November 21, 8 p.m. (ordinary meeting.) Opening address of the 147th session, by Sir John Evans, K.C.B., F.R.S., Chairman of the Council. Monday, November 26, 8 p.m. (Cantor Lecture.) Professor J. A. Fleming, F.R.S., "Electric Oscillations and Electric Waves." (Lecture I.) Wednesday, November 28, 8 p.m. (Ordinary Meeting.) Major Ronald Ross, "Malaria and Mosquitoes." Professor Ray Lankester, F.R.S., in the chair. Monday, December 3, 8 p.m. (Cantor Lecture.) Professor J. A. Fleming, F.R.S., "Electric Oscillations and Electric Waves." (Lecture II.) Wednesday, December 5, 8 p.m. (Ordinary Meeting.) Professor H. S. Hele Shaw, F.R.S., "Road Traction." Sir Frederick Bramwell, Bart., F.R.S., in the chair. Monday, December 10, 8 p.m. (Cantor Lecture.) Professor J. A. Fleming, F.R.S., "Electric Oscillations and Electric Waves." (Lecture III.) Wednesday, December 12, 8 p.m. (Ordinary Meeting.) Professor Frank Clowes, D.Sc., "The Treatment of London Sewage." Monday, December 17, 8 p.m. (Cantor Lecture.) Professor J. A. Fleming, F.R.S., "Electric Oscillations and Electric Waves." (Lecture IV.) Wednesday, December 19, 8 p.m. (Ordinary Meeting.) W. T. Maud (special artist to the "Graphic"), "The Siege of Ladysmith."

Commercial Intelligence.

THE Southwark Photo Engraving Co., Ltd., of 241, Blackfriars Road, London, S.E., inform us that the title of the company, "W. R. Sleigh, Ltd.," has been altered to the "Southwark Photo-Engraving Company, Limited."

ACCORDING to the "Patent Journal," a Convention has been concluded between the United Kingdom and the Republic of Costa Rica for the reciprocal protection of Trade Marks and Designs, and will come into operation on October 29, 1900.

ON Saturday evening last some premises at Snow-hill, Birmingham, owned by Mr. W. Tylar, of High-street, Aston, and let to a number of small mechanical workers, were partly destroyed by fire. Several hundreds of pounds worth of damage were done, and many men are thrown out of employment.

RE Albert Edward Billows, Photographer, Oakham.—The public examination of the above-named debtor took place at the Leicester Bankruptcy Court on Friday last, before Mr. Registrar Toller. The statement of affairs filed by the debtor disclosed a deficiency of £98 10s. 2d. Replying to questions put by the Official Receiver, debtor stated that he had done a small business in selling photo materials to amateurs, but, being a professional photographer, he was unable to obtain these goods on such favourable terms as the ordinary photographic dealers.—The debtor was allowed to pass his examination.

RE William John Hawker, Photographer, "Nyassa," Talbot-road, Winton, and The Square, Bournemouth.—This debtor appeared for his public examination at the Poole Bankruptcy Court, before Mr. Registrar Dickinson, on October 25. The summary of accounts filed by the debtor disclosed liabilities amounting to £776 4s. 7d., and nett assets estimated to produce £60 12s., thus leaving a deficiency of £715 12s. 7d. In answer to questions put by the Official Receiver, debtor stated that he had been in business in Bournemouth for 33 years. He had no capital of his own when he commenced, but he borrowed some, and for the first 12 years of his trading he had a studio in one of the wings of the Belle Vue Hotel. Afterwards he took premises in the Old Christchurch-road, and about two years and nine months ago he took premises in The Square, Bournemouth. He was solvent when he went to The Square, but he soon discovered that he had made a mistake in going there. He attributed his present deficiency to his trading there. He became aware of his insolvency about six months ago, but he kept on, hoping matters would improve.—Eventually the examination was formally adjourned until the next Court.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
5.....	Bognor	Prints for Criticism.
5.....	Bootle	{ Demonstration: Carbon Printing for Beginners. L. D. Wood.
6.....	Gospel Oak	{ Demonstration: Lantern Slides by the Collodion Process. W. Beyer.
6.....	Royal Photographic Society ..	{ Cities and Sights of Spain. Mrs. Aubrey Le Blond.
7.....	Borough Polytechnic	E'press Developing. W. F. Crawford.
7.....	Croydon Camera Club	{ Address with Illustrations: Lighting and Posing in Photographic Portraiture.
7.....	Edinburgh Photo. Society ..	{ Demonstration: A Plea for Stereoscopic Photography. William Goodwin.
7.....	Photographic Club	Annual General Meeting.
7.....	Woodford	Technical Lecture by R. Child Bayley.
8.....	Hull	{ Slides by the Borough Polytechnic Society, and a Criticism.
8.....	Leigh	{ Demonstration: Kodak Rollable Film. A. B. Cramp.
8.....	Liverpool Amateur	{ Demonstration: Films versus Plates, and the New Thornton Film. Walter D. Welford, F.R.P.S.
8.....	London and Provincial	Paper by E. T. Wright.
8.....	Woolwich Photo. Society	Flower Photography. H. J. Malby.
9.....	Borough Polytechnic	{ Instruction Evening: Enlarging on Bro- mide Paper.
9.....	Croydon Microscopical	{ Narrow and Wide-angle Lenses. W. E. Debenham.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 25.—Mr. E. Human in the chair.

Mr. Rapson showed two negatives that had been equally exposed and developed; one of these had been left with just sufficient hypo to cover it for 24 hours without motion, and in comparison with the other that had only been left in the usual time, showed a very decided change in colour and density, especially in the half-tones. Mr. Haddon, remarking on this, said that one day he had left a developed bromide print in hypo until the next morning, when on examination those portions nearest the surface showed reddish patches, and the remainder being unchanged, thus showing that without oxygen no change takes place in the developed image. Mr. Henderson remarked that it had often been his practice to take the negative out of the hypo, and stand it in the air to thin it. Mr. Henderson then raised a contention that it was possible to entirely dissolve the developed image in a bromide plate, and challenged Mr. Haddon to prove otherwise, quoting tests that he had made with bichloride of mercury and ammonia and other substances. Mr. Haddon said he would try and find time to settle this question, and prove to Mr. Henderson that it was absolutely impossible to entirely reduce the developed image without removing the gelatine also.

PHOTOGRAPHIC CLUB.

OCTOBER 24.—Mr. E. J. Wall in the chair.

Mr. George E. Brown read a paper on "Meyer's Silver Phosphate Process." A print-out paper in which phosphate of silver is the sensitive material has been invented by Dr. Johannes Meyer, of New York, and is just now being placed upon the American market. The novelty of the process, as compared with the early use of silver phosphate by Fyfe and by Lyte, is that it is applied to the paper as an emulsion in tartaric acid solution. No gelatine or other vehicle is employed, so that the paper possesses the ease of manipulation characteristic of plain salted paper, while, at the same time, it is about as rapid as gelatino-citro-chloride. The special features from the point of view of the user are the rich brownish sepia tone obtained by simple fixing; no over-printing is necessary, and a much weaker solution of hypo than that generally used can be employed. The paper is amenable to the usual toning baths in which it tones very quickly. The most satisfactory black tones are obtained by slightly over-printing and the use of a platinum bath. Gold, it was shown, does not give a strong tone so easily; delicate greys are obtained in rather weak gold baths. The paper has been received with favour by prominent photographers in America, including Mrs. Kasebier and others of the new American school. A number of prints, lent by Dr. Robert C. Schupphaus, of New York, were shown, and included some from Mrs. Kasebier's negatives. The phosphate emulsion has also been found by Dr. Valenta to be of value as an addition to the ordinary collodio-chloride emulsion. Paper coated with emulsion thus modified is stated by Valenta to be four times as rapid as ordinary collodion paper, and to give a longer range of gradation. It is also stated that paper coated with gelatino-bromide emulsion containing phosphate emulsion prints out by gas light. Mr. Brown proceeded to demonstrate the process, treating several prints, which were subsequently passed round for inspection.

Mr. Archer Clark, inquiring as to the permanency of the prints, referred to some experiments he had made some years before, and said that the only print of the batch made that had faded was a phosphate print. The connection with the present process was not a close one perhaps, but the fact was interesting in a general way.

The Chairman drew attention to the fact that the half of a print that had been fixed when placed against the other half showed a marked shortening of scale at both ends. He saw no advantage in dispensing with gelatine or some colloid in the paper. The prints while wet looked nice, but when dry the appearance was sunken and dead. A small amount of colloid would improve the effect considerably. Of course, the fact that no free silver was necessary in the paper was an advantage, and the paper should keep very well in consequence. The Chairman said he had tried the phosphate emulsion with gelatine and with collodion. It answered very well, but did not increase the speed of the collodion paper so much as it did the gelatine. He had also used it with bromide emulsions, fast and slow, but the printed-out image obtainable was lacking in intensity, and was not worth anything.

After some further discussion, a vote of thanks was passed to Mr. Brown for his interesting communication.

Mr. H. Snowden Ward communicated to the meeting some facts concerning the recent death of Mr. Thomas Fall, who for many years was a member of the Club.

The Secretary was directed to convey to the family of the deceased an expression of deep regret felt by the members of the Club in its bereavement.

A welcome was given to the Rev. J. C. Harris, Vice-President of the Johannesburg Photographic Society. Mr. Harris gave a short account of his Society, which, before the war, was in a most flourishing condition.

Richmond Camera Club.—At the meeting on October 8th, Mr. Cembrano gave an elementary discourse on "Development." He commenced by dwelling on the importance of exposure in ensuring good results, and strongly recommended that the beginner should err on the side of over-exposure, as nothing satisfactory could be done with an under-exposed plate. He named the points necessary to obtain correct exposure as follows:—(1) Study the subject; (2) observe the kind of light at the time of exposure; (3) keep to one kind of plate, so as to know its capabilities well; (4) know the capabilities of your lens; (5) and of your shutter; and, finally (6), keep to one developer. Mr. Cembrano strongly advised keeping a note of each exposure, and—what is often omitted by those who do this—write against each exposure the character of the resulting negative. He also thought that the use of an actinometer was a great assistance to the beginner. He preferred what is called a quick plate to a slow one, it being more generally useful, and, as a rule, yielding softer negatives than a slow one. As regards the developer itself, he preferred pyro with carbonate of soda, and he mentioned that in the case of an over-exposed plate it was a good plan to add a large quantity of pyro—say, 6 grains to the ounce—to the developer. This stopped development at once, and the alkali could then be added gradually, with the result that a much better printing negative would be secured. Great stress was laid on the advisability of having a good light in the room. Personally, he found that an argand burner shielded by two thicknesses of canary medium was quite safe. Naturally the light was kept low at the beginning of development, and the dish covered. After the image was out, the light could be safely turned up. Of course, this light could not be used for isochromatic plates, and for this reason he seldom used them.—At the meeting on October 22, Mr. Walter Welford demonstrated the merits of the new Thornton film. He commenced by pointing out the advantages as regards lightness, space occupied, and non-liability to breakage that films enjoyed over plates, and, as regards the Thornton film especially, the ability to print from either side without loss of sharpness owing to the thinness of the film. This was of great advantage to process-

workers and printers in carbon, as the troublesome processes of making a reversed negative in the one case and of the double transfer in the other were done away with. He then passed round specimens of the films, unstripped and stripped, and of the backing paper, together with some prints of his own from negatives taken on the films. He also showed the perfect ease with which the film left the backing paper when it was dry, and he showed that with the aid of a piece of cardboard, the film lay flat in the dark slide. After developing and fixing two films, which showed incidentally that they did not curl up in the developer, but lay as flat as plates, he stripped one from the support, and placed it in a dish of plain water to show the extent to which it expanded. It was necessary in this case to float the film on a glass plate to dry, and, if the plate were prepared in the usual way with French chalk, the film could be stripped from it when dry as easily as if it had been left attached to the original support.

South Norwood Amateur Photographic Society.—Oct. 25th, Mr. Ramsay, of Kodak, Ltd., gave a demonstration of the various productions of the Kodak firm. He described in detail the mechanism of the new Panoram Kodak, the lens of which turns round through almost a half-circle during the exposure, producing a long narrow picture, in which the objects represented have a much more natural appearance than they have when photographed with a fixed lens camera. The various folding pocket Kodaks were also fully described, and a spool of Kodak film was developed. Mr. Ramsay drew special attention to the care required in wetting the film uniformly before development, and in the avoidance of air bubbles on the film whilst development was in progress.

North Middlesex Photographic Society.—October 22nd, Instruction Evening, Mr. A. H. Lisett gave a lecture on "Home Portraiture." He said portraiture was more difficult for beginners than landscape, but the material was always ready at home, and, by keeping on trying, very good results could be obtained. He cautioned would-be portraitists not to copy slavishly the professional. Children made very good models, as they were not so self-conscious as adults. He showed how an ordinary room lit by one window could be made to give very satisfactory results. A reflector of white paper or similar material hung over chairs, or a screen to lighten the shadows, which would be otherwise too heavy, should be placed so the light from the window should be thrown back on the sitter. An incandescent light with opal globe acted as a very good reflector. The lens used should be of fairly long focus, say, 7 in. for a $\frac{1}{4}$ -plate, and as rapid as possible. As a general rule the eyes should be focussed, and care should be used as to the direction in which they were looking, generally straight out of the face was best. Orthochromatic plates were best, and they should be developed thin.

Liverpool Amateur Photographic Association.—October 27th. Business including the election of three new members having been disposed of, the President apologised for the absence, through illness, of Mr. E. R. Dibdin, who was down on the programme as the lecturer of the evening. Mr. Dibdin's place was, however, filled by Mr. Harvey, whose subject, "A Tour in Southern Germany," proved most interesting. Mr. Harvey's journey was by way of Harwich, the Hook of Holland, Cologne, Coburg, Nurenberg, Dresden, and Hedesheim, and the pictures taken en route and shown on the screen were of the highest order. The lecturer pointed his remarks with many pithy anecdotes and quotations.

Hull Photographic Society.—October 25th, before more than 80 members of the Society, Mr. Donald A. Nightingale gave a demonstration of Messrs. Griffin's specialities. Notably, in connection with velox, the double-weight paper, produced a most favourable impression. A tube, composed of celluloid, which will shortly replace the glass tubes used for packing Cartol developers, was also exhibited. An excellent lantern slide was also exhibited. An excellent lantern slide was produced on the Gaslyt plates. This same slide was, a few minutes afterwards, projected on to the screen.

FORTHCOMING EXHIBITIONS.

1900.

- November 2, 3 Photographic Salon, Dudley Gallery, Piccadilly. Hon. Secretary, R. W. Craigie, Camera Club, Charing Cross-road, W.C.
- " 2, 3 Royal Photographic Society, New Gallery, Regent-street. The Hon. Secretary, 66, Russell-square, W.C.
- " 2, 3 Sefton Park Photographic Society. Hon. Secretary, G. Birtwhistle, 7, Gainsborough-road, Sefton Park, Liverpool.
- " 7-10 Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E.
- " 12-17 Ashton-under-Lyne.
- " 19-24 Waterloo and Blundellsands Photographic Society. Hon. Secretary, W. G. Eyre, 2, Mersey-road, Blundellsands.
- " 21-23 Hackney Photographic Society. Hon. Secretary, W. Selfe, 70, Paragon-road, Hackney, N.E.

- November 21-24 Cleveland Camera Club. Hon. Secretary, F. W. Pearson, 98, Victoria-road, Middlesbrough.
- " 22-24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove. 1901.
- January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.

Patent News.

THE following applications for Patents were made between October 15 and October 20, 1900:—

- PRINTING FRAMES.**—No. 18,297. "Improvements in Photographic Printing Frames." J. WILKINSON and A. WILKINSON.
- CINEMATOGRAPH AND HAND CAMERA.**—No. 18,363. "Combined Cinematograph and ordinary Hand Camera." A. ROSENBERG.
- CINEMATOGRAPH APPARATUS.**—No. 18,364. "Improvements in Cinematographic Apparatus." A. ROSENBERG.
- FILM-CHANGER.**—No. 18,535. "A New or Improved Device for Changing Photographic Plates or Films in Daylight." Complete specification, C. P. GOERZ.
- PRINTING FRAMES.**—No. 18,585. "Improvements in Photographic Printing Frames." J. WILKINSON and A. WILKINSON.
- PRINT WASHERS.**—No. 18,662. "Improvements in Photographic Print Washers." A. VAN HOORN.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

PORTRAITS BY MRS. CAMERON AT BROCKENHURST.

To the Editors.

GENTLEMEN,—It may not be generally known that a small collection of portraits by the late Mrs. Cameron is in existence in the heart of the New Forest. Some time ago, when waiting for a train at Brockenhurst Station, I strolled into one of the waiting-rooms, and, to my surprise, found it adorned with a collection of photographic portraits. On examination these proved to be by the photographer above mentioned, and I should say are very fine examples. The finest of the series is a portrait of G. F. Watts, though probably that of Sir J. Herschel most nearly illustrates the original treatment for which Mrs. Cameron was noted. Each portrait bears full data, presumably by Mrs. Cameron herself, of the date of the picture's production, the subject's name, &c. The pictures were presented by Mrs. Cameron in 1871 to the waiting-room of the station, as it was in this room she met her son on his return from India. The prints are in excellent preservation, considering their age, the exposure they have experienced, and the utter lack of any care for them. They certainly are a fine tribute to the stability of albumen prints when carefully produced. I interviewed the station-master with regard to their presentation, but he had been appointed to the station subsequently, and referred me to a porter who remembered the occasion. This official informed me that he was the only person who took any interest in them, and that he "dusted them every year." In the interests of historical photography, I tendered him a small honorarium, and begged that he would still continue to exert his benevolent ministrations.—I am, yours, &c.,

GEORGE T. HARRIS.

Brockenhurst, October 28, 1900.

[We are very much obliged to our friend Mr. Harris for drawing our attention to the existence of some of Mrs. Cameron's pictures at Brockenhurst Station. Dr. Emerson, who resides in the neighbourhood, had previously spoken to us on the subject. In the course of a few weeks we hope to pass a short holiday near the New Forest, and will take the opportunity of inspecting the photographs, and, maybe, of interesting ourselves in their preservation. Eds.]

THE LATE THOMAS FALL.

To the Editors.

GENTLEMEN,—Doubtless all photographers will read with deep regret the decease of Mr. Thomas Fall. I feel I cannot let the time pass without adding testimony. He frequently came to my studio when in Brighton, and did many acts of help, advice, and kindness which I could never hope to repay. I am sure the list of kindly acts done by him to brother professionals must be a very long one, and the spirit that prompted those acts an example that may most safely be followed both by photographers and all men.—I am, yours, &c.

HENRY SPINE.

109, Western-road, Brighton.

To the Editors.

GENTLEMEN.—With very deep regret I have seen your obituary notice of the late Mr. Thomas Fall, and quite endorse your remark as to the loss sustained by those interested in photography in this country. The last time I had the pleasure of seeing Mr. Fall was when he came over to Dublin fourteen months ago, and, though only here for a couple of days, he came in to me to have a long chat. I deeply deplore his loss, along with many of your readers.

May I take this opportunity of thanking your critic of the Holland Day Exhibition for so kindly mentioning my name in connection with his remarks thereon.—I am, yours, &c.,

ALFRED WERNER.

39, Grafton-street, Dublin, October 30, 1900.

PHOTOGRAPHY OF NATURAL COLOURS.

To the Editors.

GENTLEMEN.—Your readers may be interested to know that specimens of work by the McDonough-Joly process will be shown, by request, at the following Exhibitions:—

Cripplegate Photographic Society, Cripplegate Institute, November 7th to 10th inclusive.

Ashton-under-Lyne Photographic Society, Town Hall, Ashton-under-Lyne, November 12th to 17th inclusive.

Cleveland Camera Club, Cleveland Hall, Middlesbrough, November 21st to 24th inclusive.

The pictures, which will be on view, are transparencies on glass, and represent the most brilliant tints and hues, as well as the more sombre tones of natural and other colours. We may add that by our process magic lantern slides can be made almost as cheaply as the uncoloured slides of the present day.—We are, yours, &c.,

COLOR-PHOTO Co.

Birkbeck Bank-chambers, Southampton-buildings, Holborn, W.C.
October 26, 1900.

THE EXHIBITION OF AMERICAN PHOTOGRAPHY AT RUSSELL SQUARE.

To the Editors.

GENTLEMEN.—I do not suppose you wish to arouse any discussion as to the propriety of such photography as Mr. Holland Day's sacred subjects in the above exhibition, but your very vigorous references to these studies and their maker in your article of the 26th, impels me to ask space for a few lines of defence of one who has been an intimate friend for some years. Let me say at the outset that a copy of his picture, "The Seven Last Words," has been in my possession for over a twelve-month, and has been shown to very many friends and visitors, without at any time eliciting anything but complete approval, and with a complete absence of any feeling of disrespect or irreverence. I remember that I ventured to warn Mr. Day that such work might prove but waste labour over here, and perhaps in his own country prove dangerous, as it might lead to a discipleship that would produce things which, by their incompleteness, mistakes, or shortcomings, would prove irreverent, as suggesting things the reverse of what a successful effort would suggest in connection with so sacred a theme.

Mr. Day has been successful because he has proved so wonderful a model, as any dispassionate study of "The Seven Last Words" will at once show; and this brings me to your chief point against him, his own posing as the Christ model. I would like to ask this question: If Mr. Day had taken the Ober-Ammergau actor, Joseph Mayer (or his successor) as his model, and used him as he has used himself, would your denunciations be as fierce, or would they even exist? I do not remember your ever having fulminated against the photographs of the Ober-Ammergau actors, in every stage of the sacred drama, though they have been published in this country. I have now before me a small collection of C.D.V. portraits in character of these actors published by Marion and Co., and I would ask where is the difference? In both cases a living person is used as the model because of a supposed suitable personality. You utterly condemn one. It will be interesting to have your opinion of the other. Or suppose Joseph Mayer to have been gifted with Mr. Day's photographic skill and taste, and that he had photographed himself in his actor's robes as the Christ, as Mr. Holland Day has done, would you have approved him, or have meted out to him the sentence "Guilty of the most flagrant offence against good taste that has ever come under our notice?" Is it possible that what is proper and commendable in a Bavarian is vicious, a "flagrant offence" in an American?

It is to be hoped that some of the visitors to Russell-square will also have been visitors to Ober-Ammergau. What will their feelings and opinions be? Yours, or those which permit thousands of religious people, lay and clerical alike, from Dean Farrar downwards, to witness each Ober-Ammergau festival with approval and satisfaction?

If you had not known Mr. Day to have been his own model, would your opinion have been of the same sort and as extreme? If so, it is because the pictures themselves arouse by their treatment a feeling of intentional disrespect to the Saviour of Mankind, a feeling which, to me, seems a sheer impossibility for the pictures to arouse in any one.

I think a sense of fairness in journalism would have suggested leaving the feeble extravagances of poor Mr. Hartmann alone, and not using them as a lever by which to force or bias public opinion against Mr. Day and his works, by the gratuitous assumption that he himself was in sympathy with, or responsible, for their ineptitudes. I can vouch personally for Mr. Day's entire singleness and simplicity of

purpose in these works; indeed, a reverence of motive, an entire absence of vulgar straining after false effect, a quiet dignity and pathos, informs each study; but how otherwise could it be from an artist and a gentleman? Is it conceivable that he should undertake such labour merely to shock and outrage public taste, and proclaim himself the irreverent trickster your articles infer he is?

Your journal has a history that is associated with an amount of fairness and impartiality that makes your recent departures particularly unfortunate. Any new departure in photographic work should be met with criticism, real critical criticism, destructive and constructive, not with mere expressions of likes or dislikes, or such unfair personalities as your quotations from the unlucky Hartmann. If you had quoted them as condemning them, but not necessarily their subject also, what a different flavour would have been imparted to your article.

Hoping you will favour me and your readers with your opinions on the Ober-Ammergau actors and their photographs in relation to your condemnation of Mr. Holland Day's photographs of similar subjects,—I am, yours, &c.,

FREDERICK H. EVANS.

27, Fairfax-road, Bedford Park, W., October 19, 1900.

[It has probably escaped the notice of Mr. Evans that in THE BRITISH JOURNAL OF PHOTOGRAPHY of February 24, 1899, we referred in the following terms to some of Mr. Holland Day's "sacred" photographs, which had shortly before then been shown and reproduced in this country:—"We believe there is something very widely repugnant in the idea of persons posing before a lens in sacred character, and that, no matter how skilfully and reverently the photographs have been produced and treated, the incongruity and doubtful taste of nineteenth-century persons presuming to make up as actors or participants in dramatised portions of what so many millions of persons regard as the Divine redemption of the human race, can never be obliterated from the minds of those called upon to contemplate the photographic results." We then proceeded to consider some reproductions of "three photographs purporting to represent the Crucifixion and the Entombment, by one of the most intellectual photographers yet produced by the United States—we mean Mr. F. Holland Day—whose pictorial work for the last two or three years has been favourably known on this side of the Atlantic." The remainder of our remarks was as follows:—"The titles of Mr. Day's photographs are 'Into Thy Hands,' 'The Entombment,' and 'I Thirst'; and we mean no offence when we say that to us, as photographers, they are exceedingly repulsive, in virtue of their obvious reliance upon the 'art' of the person who made or built them up. The ruthless lens reveals every little trick or artifice employed in 'faking up' the originals; and we confess it is with something of a shock that we contemplate these photographically vamped-up representations of what are so generally regarded as three of the most moving incidents of the World's Tragedy figuring in the pages of an illustrated magazine. To the best of our belief and knowledge, sacred art, so called, has not yet inspired British photography. At the moment we can only recall three pseudo-sacred photographs publicly exhibited—a 'Christian Martyr' and two 'Magdalenes,' and this in an experience of about twenty years of the exhibitions. Those attempts were coldly received by the photographic public, and we cannot discover that any inducement has been forthcoming to other photographers to select even graver themes than those mentioned. We hope matters will remain so. The lens and the dry plate do not idealise as the painter or the draughtsman can or may. The very finest skill of the foremost British photographers, we are convinced, would break down at any attempt to divest a sacred subject, taken by means of the camera, of those insistent and cartographical details which impart an element of repulsiveness, in our eyes, to Mr. Holland Day's photographs—repulsive because we are conscious that the individuality of the originals has not been, cannot be, so completely masked or subdued as to destroy the mental persuasion that we are looking at the image of a man made up to be photographed as the Christian Redeemer, and not at an artist's reverent and mental conception of a suffering Christ. We hope that neither Mr. Holland Day nor anybody else will misunderstand our motive in drawing attention to this matter, as to which we believe we give expression to sentiments almost universally entertained by British photographers. Not only for the reasons given are sacred subjects best denied treatment by the camera, but also in the interests of photography and photographers themselves, who would surely provoke the hostile opinion of the educated public by any appreciable attempt to deflect camera work from its legitimate paths. A moment's reflection will show that the scope opened up by allowing that sacred subjects are admissible for photographic treatment is practically illimitable, and that the possibilities of offending the deepest susceptibilities and convictions of millions of minds are just as great. We trust Mr. Holland Day's example will not find imitators in this country, and that in his own it will speedily be recognised that the reasons for denying to 'sacred art' photographic treatment are so numerous and weighty, that a very serious responsibility is incurred in ignoring or overlooking them." This extract should convince our correspondent that our objections to Mr. Holland Day's sacred art photographs were just as emphatic nearly two years ago as when penning our article last week. We concede at once that Mr. Evans makes for a strong point by asking our opinion of the Ober-Ammergau Passion Play, and the photographic representations of it. We object to both, and for reasons which the foregoing extract should

make plain to the extent desirable. The other points in Mr. Evans' letter can only be dealt with very briefly. "The feeble extravagancies and ineptitudes of poor Mr. Hartmann" appeared in an American paper, "The Photographic Times," and they were illustrated by some of Mr. Day's photographs, presumably supplied for the purpose. Mr. Hartmann appears to be appreciator-in-chief to the new school of American photographers, and if those ladies and gentlemen are not in sympathy with his point of view, it is curious that they give him such excellent facilities "for writing them up." We are not unfamiliar with the way in which the gentle art of interviewing is practised. The penultimate paragraph of Mr. Evans' letter, in which, after charging us with partiality and unfairness on very unsubstantial grounds indeed, he considerably tells us how to write our articles, adds a touch of humour to a literary production which, perhaps, will not be taken quite so seriously as the author expects.—Eds.]

BLUE PRINTING.

To the Editors.

GENTLEMEN.—The letter of your correspondent, "T. H. A.", is interesting from two points of view. The exposure of ferro-prussiate paper as at present turned out by competent makers is, under a tracing, one to two minutes in sunshine—that is clear and unobstructed sunshine. It may reach five minutes under unfavourable circumstances, such as we have to contend with in large towns and manufacturing districts. With photographers' negatives it may be from two to ten, or even fifteen minutes, in sunshine, according to the density of the negative, which, we know, is a very uncertain factor. But the difficulty arises when the two conditions of lighting are compared.

If in the one case of sunshine it takes 10 to 15 minutes to expose a print fully, it must at least take a day, or the better part of one, to make an exposure to the same grade of intensity without sunshine. If, on the other hand, dull or cloudy light will produce a print in 20 to 30 minutes, the same paper will print in sunshine in less than a minute. We are producing papers to order that are three times as quick as stock papers usually sensitised. It is intended for winter exposures, and has rendered services in many instances where it could be used under circumstances which were prohibitive for ordinary paper.—I am, yours, &c.,

J. R. GOTZ.

215, Shaftesbury-avenue, London, October 25, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

- A. W. Sargent, 12, Albany-road, Cardiff.—Photograph of the Rev. M G Pearce.
- J. White, 7, Beach-road, Littlehampton.—Photograph of C.I.V. memorial tablet.
- L. Varney, Buckingham.—Photograph of 56th and 57th Imperial Yeomanry Companies.
- B. Redford, 11, Summerhill-street, Newcastle-on-Tyne.—Photograph of Cathedral, Newcastle-on-Tyne.
- A. Young, 2, Pall Mall, Manchester.—Photograph of Tysoe v. Bennett on the mark for three-quarter Championship of the World.
- F. Coghlan, 31, Carlisle-road, Londonderry.—Photograph of Colonel Chamberlain and Officers of Counties Derry, Donegal, and Tyrone, R.I.C.

DRY FERROTYPE PLATES.—R. O. C. These plates may be had from Fallow-field's, Charing Cross-road.

F. A.—"Wilson's Photographic Magazine," published at 289, Fourth-avenue, New York, perhaps meets your requirements. A copy may be obtained of Messrs. Dawbarn and Ward, Farringdon-Avenue, E.C.

IN TROUBLE.—We do not know the name of the maker of the lenses referred to; but as you ask for a city address, perhaps if you inquire of Messrs. A. E. Staley and Co., 35, Aldermanbury, E.C., they may be able to help you in the matter.

PRINTING PROCESSES.—F. G. asks: "Would you please inform me the cheapest paper to use for printing views on, and where I should get it; also the name of a firm that would print cheap albums of views?"—In reply: Our correspondent's question is not so explicit as it should be. Does he refer to photographic or letter-press printing? Let him say, and we will advise him accordingly.

VULCAN.—The formulæ were quoted for the intensification of negatives by the Lippmann process. A thousand grammes is probably meant, a figure having been dropped. For a metol solution dissolve 1 part to 10 of sulphite in 10 ounces of water.

M. A. C.—(1) We can only reply to you in the terms of the answer given to "All" elsewhere in this column. (2) Develop your negative as you would for gelatino-chloride prints, and it will answer well for reproduction purposes—the requirements are moderate density, clearness in the lights and middle-tones, and unclogged shadows.

BOOK ON RETOUCHING.—STAMP PRINTING FRAME.—E. WATKINS asks: (1) Can you tell me where I could get a good book on retouching? (2) Also, where I can get a stamp printing frame?—In reply: (1) Robert Johnson's book, published by Messrs. Marion and Co., Soho-square, W.C. (2) We believe Mr. George Jobson, of Horn-castle, can supply you with such a machine.

"ALL."—It is against our rules to recommend apparatus or offer such opinions as you ask for. We can, therefore, only reply to you in general terms. Better get the catalogues of a few dealers or makers, and, so guided by your requirements and your financial resources, make your choice. There are dozens of cameras on the market with which you can do the kinds of work you mention.

BOOKS ON WORKING-UP BROMIDES.—"Book" writes: Will you kindly tell me if there is a book published on colouring bromides in water-colour and oils, and, if so, where can I get same?—In reply: A little book by Mr. Bool, published by Messrs. Percy Lund and Co., Bradford, may help you. Consult the chapters on the subject in Johnson's book on retouching, published by Messrs. Marion, Soho-square, W.C.

PHOTOGRAPHY IN SOUTH AFRICA.—PYRO asks: (1) Whether there will be any scope for photography in South Africa after the war? (2) If the prices of paper, plates, chemicals, &c., are much more expensive?—In reply: (1) According to the newspapers, the Military Authorities are constantly warning intending emigrants to defer going to South Africa until the country is in a settled state. Possibly in a year's time there may be some chance for you. (2) No doubt there would be a considerable advance in the prices.

RESTORING SPOILT BLUE PAPER.—G. R. writes: "I have a large roll of blue paper for iron printing, but it appears to have lost its sensibility, although still a good blue colour. I presume the climate has ruined it. I shall be obliged if you can tell me of any means of resensitising it."—In reply: If the paper has been ruined by the climate we fear there is no method of restoring it to its pristine condition. If there were, the trouble involved would be more than the paper is worth, and even then it would not be very satisfactory; certainly not so good as at first.

COLOUR PRINTING.—W. T. writes: "I should be obliged if you would kindly let me know the addresses of some printing firms who would produce small quantities of imitation colour photographs, the same as seen in railway carriages? I have written several houses who go in for collotype printing, but cannot find any one who does such work as I want."—In reply: The "railway carriage-process" is worked by the Photochrom Co., of 121, Cheapside, who might quote our correspondent for his requirements. But a "small quantity of imitation colour photographs" is an order which in all probability he will find it difficult to place.

GRANULARITY IN ENLARGING.—J. C. S. writes: "I am enlarging a silver print photo of a deceased friend, and find the negative I have taken for the purpose gives a 'granulated' print. I have taken several negatives, and they are all alike. Can you tell me the cause, and suggest a remedy? The plates used were Ilford chromatic, and but for the defect mentioned, would have been satisfactory."—In reply: The cause of the granularity is that the print is not rightly illuminated. Light in such a way that the granularity does not show when the image is examined on the ground glass. Let the light reach the picture at such an angle that it is reflected away from the lens, and not into it.

BELITSZKI'S REDUCER.—"R. S." writes: (1) In the ALMANAC potassium ferric oxalate is given as one of the ingredients, but this is not kept in stock by photographic dealers or chemists. Where can it be procured? (2) The Barnet Book, p. 239, gives a different description of this reducer, the formulæ having more chemicals than that in the ALMANAC. Is it an improved form?—In reply: (1) You might get the substance from Messrs. Harrington Bros., Oliver's-yard, City-road, London, E.C., or some other firm of manufacturing chemists. (2) Perhaps for bromide paper the formula in question would tend to prevent dissolution of the image and whites; but we have not tried it.

LENS APERTURE AND DEVELOPMENT FOR PORTRAITURE.—S. Watteau asks: "What is the best stop to use for portraiture? Is it desirable to slightly over-expose to get more detail, and which is the better plan of the two?—to put all the accelerator they mention in formula and retard by use of potassium bromide, or to add the accelerator by degrees, and not to use any bromide? I should feel deeply grateful for any hints in the development of portraiture, and how to tell when you have sufficient density?"—In reply: In portraiture use the largest stop that will give the desired definition over the plate used. Give the right exposure. There is no use in over-exposing. Employ the developer as recommended by the makers of the plates. The requisite density is judged by looking through the negative as it is developing. Judgment is the only guide, and that is easily acquired.

DECIDING A WAGER.—C. W. As the prints are sent to us, as you say, merely to decide a bet, we decline to give any opinion on them whatever. The object of this column is not to decide bets, but to give useful information to such as require it.

WILLESDEN PAPER.—P. CONWAY asks our opinion of Willesden paper for roofing a studio, and where it is to be obtained? We have had no experience of the material for the purpose referred to, so cannot express an opinion on it. The address asked for is the Willesden Paper Co., Willesden Junction, N.W.

FAULTY LIGHTING.—GEO. LEAMER. The only fault in the portraits for warded is in the lighting. In all of them there is far too much direct front top light, hence their general flatness. Subdue the top light, and use a stronger front light. Probably the same amount of side light would suffice if more of the top light were blinded off.

OLD NEGATIVES.—**BEGINNER IN BUSINESS** writes: "I have just opened a business here, and a photographer who once had a studio in the place, some time ago, has a large number of negatives, portraits, which he took by the wet-collodion process, and they are all on patent plate glass. He has offered me the lot for the price the glass cost him, but, as there are some thousands of them, they will come to a lot of money. I should like to have your opinion as to whether it would be a good speculation before deciding."—We should say not. As they were taken in the wet-collodion days, they must be something like twenty years old, and fashions in dress have changed greatly in the time, and the sitters, if living, have also changed greatly, and would not be likely to order duplicates from the negatives.

FIXING COLLODIO-CHLORIDE PRINTS.—ZETA writes: "Please state your candid opinion as to bodily lifting the whole job lot, 400 prints or more, cabinets and cartes, by the one hand direct out of wash for toning, and holding the same firmly with the other hand, and depositing them as clogged together direct into the hypo bath? They could not be separated singly in a minute, and afterwards returned as usual to complete fixation?"—In reply: If the 400 prints were put in a "lump," sticking together, in the fixing bath, as stated, stains would be the inevitable result from imperfect fixation in parts. The prints should have been put into the hypo solution singly, or in batches of half a dozen or so, and immediately separated and kept in motion while the remainder were similarly dealt with. It is no wonder that the lot were spoilt. It is only what might have been expected under the circumstances.

STUDIO BUILDING, &c.—PYRO asks: "My studio, which faces N.N.W., gives too strong a light, although I have white blinds and dark green ones at the side, the green over the white, and white ones at the top, with buff ones underneath. The glass (12 feet) at the top is clear white glass, and at the side it is ground glass. When I have the double set of blinds down, and also a head screen, I have too much light. Would it answer to paint the clear glass with white paint inside? (2) Can you inform me, also, what to use with the spotting colour to give a gloss to the spots, so as to correspond with the remainder of surface when burnished? Would liquid gum mixed with the colour answer the purpose?"—In reply: (1) We see no reason, with such an arrangement of blinds, to make any alteration as regards the glass. The blinds only require to be rightly used to get any kind of lighting required. (2) A solution of gum will answer the purpose well.

REFLECTIONS IN PLATE-GLASS WINDOWS, &c.—AMIDOL writes: (1) I am in rather a difficulty to photograph a shop owing to the shops on the opposite side reflecting their wares in the one I have to take. The said shop is very open and dark, being a workshop, and the articles are plainly seen at the back of the shop reflected. What is the best remedy? (2) Is a photographer bound to give a resitting if the sitter disapproves of it, although the photograph is perfect in our estimation?"—In reply: (1) The only course open is to photograph the shop at a time when the sun is at such an angle as not to reflect the shop on the opposite side on the windows. A suitable time for that can, no doubt, be selected. (2) If the photographer, as many do, guarantees satisfactory portraits, certainly he is. Anyhow, a photographer is very unwise, in his own interests, to refuse a resitting for a portrait that is considered unsatisfactory, good though he may consider the photograph to be.

LENS QUERIES.—FOCUS writes: "Kindly reply to the following in next week's paper: (1) For a $\frac{1}{2}$ -plate, if you had a R.R. lens of about six inches focus for interior and confined situations, would you for general instantaneous work (with it I include working under unfavourable conditions of light), and general outdoor work, prefer a R.R. for a $\frac{1}{2}$ -plate of 9 or 10 inches focus? Should you consider the 10 inch too long a focus, and that its advantage of better covering power is counteracted by the additional inch of focus? My question purely applies to the R.R. combined, and has no reference to the single combinations being used for landscape lenses at present. I do not feel disposed to buy a stigmatic lens working at $f\cdot 6$, but want the best possible substitute of the R.R. type working at $f\cdot 8$, and have been strongly advised to buy a lens of 10 inch for a $\frac{1}{2}$ -plate. Do you think when I have the 6 inch focus R.R. for interiors, &c., that I could do better than get the 10 inch?"—In reply: The 10 inch focus lens should certainly cover the $\frac{1}{2}$ -plate well with its full opening, and therefore is an excellent lens for that size. But it should be borne in mind that a lens of that focal length includes but a very moderate angle on a $\frac{1}{2}$ -plate.

LANTERN SLIDES.—W. C. TURNER writes: "Which process do you think yields the best lantern slides—wet collodion, collodio-bromide, or gelatine lantern plates?"—In reply: That very much depends upon the excellence of the work by the different processes. All are good in skilful hands. Collodio-bromide yields results that are difficult to surpass, but they must be produced by a skilful collodio-bromide worker. One unskilled in either of the processes would doubtless get the best results with the ready-made gelatine lantern plate.

STUDIO LIGHTING.—SOMERSET writes: "Enclosed please find a cabinet photograph. Will you kindly suggest how I may improve the lighting of studio? This is 28 feet long, but only 12 feet of the roof at one end and 12 feet at one side are glazed; the roof (or half of it) with clear glass, and the side light with ground glass. I have a set of white blinds at the side, and over these a set of dark green ones. The roof, also, has double blinds; but white and buff instead of white and green. I also use a head screen, and yet I get too much or too strong a light on the face. I may mention that half the roof and the wall opposite the side light are painted a dark green."—In reply: With such a studio and arrangement of blinds, you should be able to get perfect lighting on the sitters. The portrait sent shows that there is far too much direct side light, which makes the picture hard and lacking in half-tone on the lighted side. The lighting is bad generally, but that is not the fault of the studio or the blinds, but the way they are used. As you appear to be somewhat a novice in portraiture, cannot you get some one in your district to give you a few practical lessons in lighting? They would help you much.

A SHATTERED DREAM.—T. M. writes: I have been dabbling in photography for a few years as an amateur, and lately I have started as a professional, thinking my work would please the public; but, alas! my dreams have been shattered. The enclosed is my first effort in group-taking since I started professionally, half a dozen of which were finished and sent, but the old lady of the group will have none of them. She writes to say they are awful things to look at, and will not have them at any price. (She paid 8s. for half a dozen.) I am afraid I have been rather premature in starting as a photographer. This is a bad beginning for me. Still, I fancy I have seen as bad work coming from professionals of long standing. Would it trouble you to say what you really think of the photo? Your verdict will mean a great deal to me one way or the other. I may say the photos were nicely mounted, and looked all right.—In reply: Although we think that the work is perhaps too well paid for at sixteen shillings the dozen, it is fairly good. Hundreds of professional men do far worse and yet seem to thrive. Do not be discouraged because at your first attempt you have not pleased a lady sitter. You must flatter the fair sex if you wish to succeed as a professional photographer.

COPYRIGHT.—B. G. writes us concerning a photograph which he took of the storm on the night of Friday last. "On Saturday morning I took these photos, and had them in the shop for sale in the afternoon. The local correspondent of a newspaper bought one, and they have published copies of my photograph, with slight alteration, in the editions of their paper to-day without asking my permission. They have not had the decency to put my name to it, or to say in any way that it was done by me. There has been such a rush for their paper to-day on account of this photo that a copy could not be obtained at 11 o'clock. Have I any remedy against them, as I think it a glaring infringement of my copyright? It is very hard after one works hard to get such things as these out to be served in such a contemptible way."—In reply: (1) The case stands thus: If the photographs were registered before the piracy you would have a clear case for infringement, and you could recover a very handsome sum. As they were not registered before the reproduction, your success in an action would be doubtful. Were we in your place, however, we should feel inclined to proceed, as we believe that in the circumstances of the case the Courts would impose heavy penalties. Better consult a solicitor conversant with copyright law and practice.

BLISTERS ON BROMIDE PRINTS.—"BLISTERS" writes: "I shall esteem it a great favour if you can enlighten me on the following: (1) Cause of blisters on the enclosed print. It is developed with hydroquinone (Ilford formulae). It sometimes appears in first washing, and sometimes in fixing, but it does not always appear, just in a batch now and again, but developer used for same stock solutions. (2) Can you let me know the best way to imitate snow on a negative? (3) In using the phosphate toning bath—i.e., 30 grains phosphate, 20 ounces of water, 1 grain gold—and it is made up about one hour before use—sometimes this bleaches a great deal, and sometimes hardly at all; can you account for this?"—In reply: (1) As the blisters do not always appear it is clear that they are not due to the paper, or the developer, but to the manipulation. The only suggestion we can make is to use all the solutions at an uniform temperature. If that is always done, no doubt, there will be no further trouble. (2) We imagine you mean falling snow before the sitter. If so, splash the negative with a pigment, say, by touching the ends of a hard brush, like a tooth brush, on the paint, and then spraying it on the negative by passing the finger over the bristles. Or the paint may, if made thin, be projected on to it by a scent sprayer. (3) If the bath be made under uniform conditions, and used under such, its action will always be uniform, and it will not reduce more at one time than at others.

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EX CATHEDRÀ.

We are asked to announce that the Traill Taylor Memorial Lecture will be delivered on Friday evening next, November 16, at the rooms of the Royal Photographic Society, 66, Russell-square, W.C. The lecturer will be Mr. Frederic E. Ives, who has chosen for his subject "The Optics of Trichromatic Photography." Admission will be free to the meeting, which is timed for eight o'clock, and the President of the Society, Mr. T. R. Dallmeyer, has kindly consented to take the chair. The choice of a lecturer is an exceedingly happy one. For over 20 years Mr. Ives has devoted himself to the study of three-colour heliochromy, and as far back as the year 1888 he publicly exhibited transparencies by the system which bears his name. His recent introduction of that ingenious instrument, the Kromskop, wherein one sees the coloured images in stereoscopic relief, will be readily recalled by our readers. To Ives is due the credit of having successfully applied the colour vision theory of Young and Helmholtz and the colour-sensation theory of Professor J. Clerk Maxwell to the production of natural colour transparencies. Upon the main subject

his writings and experiments have been exhaustive. The Franklin Institute has awarded him its gold medal for his work, which has, so far, not met with the recognition in this country which it manifestly deserves. We trust Mr. Ives will have a large and appreciative audience next Friday evening.

* * *

REFERRING to a recently published book entitled, "The Work of War Artists in South Africa," which consists of a selection of pictures produced by the several artists attached to the illustrated papers, the writer of the Art Notes in the "Pall Mall Gazette"—who, by the way, is responsible for the illustrations in the handsomely produced "Pall Mall Magazine," and has just been appointed its editor—makes some allusions to the work of the photographers on the battlefield. This subject has already been fairly dealt with in this JOURNAL, and readers may remember that some remarks by the same writer in the same paper (the "Pall Mall Gazette") were quoted in the early part of the year. However, as the subject is of considerable interest, it may not be necessary to apologise for again referring to it. The writer referred to says: "The South African war has opened a new chapter in the history of the war artist. For the first time he has come directly into competition with the camera. In Greece and Cuba the photographer was not unknown, but the conditions of the battlefield did not give him the opportunities afforded by the veldt and the widely scattered incidents of the Transvaal campaign. Unquestionably, the camera has to be reckoned with in future, not as a rival, but as a corrective and assistant of the artist. . . . One point stands out distinctly from this interesting collection. A photograph even of a hotly-contested field is the tamest affair imaginable. The lens, gaping to the horizon, has no power of selection, and loses the heated moment of the battle in the vast spaces of unoccupied ground. On the other hand, it has had a wholesome influence in taking out of the picture much of the melodrama. . . . The influence of the photograph has been all for the good of art, although it has enormously increased the labours of the artist, and once more the foolish ones who

imagined that in future the photographer would hold the field alone are out of court." We have never been among those who have assumed that in the immediate future there would be no need of the war artist. For one reason, there must be many critical engagements when neither the photographer nor the artist could be eye-witnesses. The photographer could do nothing, whereas the artist would produce a vivid picture from verbal descriptions and rough sketches furnished by the actual participants.

* * *

No one is more aware of the limitations of photography than the photographer himself; but it is a moot point whether the artist or the photographer has scored most during the South African war. Indeed, on this point, it might be interesting to give the opinion of the writer of the "Pall Mall Gazette's" art notes, published in that paper on January 31 of the present year. He then wrote: "I would like to say that the artists score off the photographer, but they do not. The public want the facts as near as may be, and are too deeply stirred to be put off with melodrama." He also wrote: "Now, in the uncompromising craze of the day for reality, the photographer has gone to the front—into the fire zone even—and the result, *if not so imaginative*, is vastly more interesting." The italics are ours. Formerly, not infrequently, actuality was sacrificed for art's sake. It would be impossible to say how many excellent pictures have been drawn from small snap-shot photographs; and it would be churlish and unjust for any artist to deny that the camera man has done much—probably more than the artist—to bring home to us the grimness and the tragedy of war during the South African operations. Some of the artists, Rene Bull, for instance, have done excellent work with their cameras. Probably the latest photographs of Prince Christian Victor were taken by this skilful draughtsman.

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CONSIDERING the great beauty of the results possible of achievement by utilising silk as a printing medium in photography, it seems strange that this and other kindred materials are not more largely employed. With the uninitiated, no doubt, there is an opinion that to produce photographs on silk means the employment of some peculiar process which differs entirely from that of ordinary printing on paper, and even among a large number of amateur workers a belief exists that, although printing upon such mediums is quite a practical thing in photography, it is much too difficult for any one who has not some special knowledge in this particular branch of work. It need hardly be said that both of these opinions are erroneous, the fact being that to print any suitable negative on a silken support is one of the easiest of all photographic printing operations. No doubt the stumbling-block, with those who consider the work beyond their capabilities, lies in the fact that sensitised silk is not generally kept in stock by photographic dealers. Therefore the moment they come to face the alternative of sensitising their own material, they sweep away all thoughts of utilising this beautiful fabric for printing their negatives. From time to time a few enterprising firms have struck out a fresh departure in this line of business, and not long ago a most excellent quality of silken fabric was placed upon the market in a ready-sensitised condition. A few dealers here and there at the time brought this material under the

notice of their customers, but, like many another good thing, the venture did not apparently meet the support it deserved.

* * *

A YOUNG lady who has learned to appreciate the pleasure of printing on silken fabrics came to us the other day and said, "I've got my eye on auntie's silk blouse; wouldn't it be just the thing for printing a few photographs on? The summer is nearly over, and she will be having a new one next year." So in time auntie was wheedled out of her blouse, and we were wheedled into providing a few suitable half-plate negatives. The scissors were soon at work, ripping open the seams of the silken article, and in less time than it takes us to pen these lines quite a number of lovely silken panels were produced that are intended to adorn a stall in a bazaar during the winter. How was this accomplished? The blouse in question was made out of what is termed washing silk; this material is particularly well suited to photography; it can easily be detected from other qualities of silk by placing a small portion in a little cold water, when it at once assumes a hard, horny appearance. It has a brilliant lustre when dry, and will, with careful rubbing, stand washing with soap and water. After washing, an old sample is wrung out and dried and ironed in a damp condition, when it will look as good as new. In this state it is ready for being salted. Nothing can be simpler than this operation. Take a pinch of salt in, say, half a teacupful of water, and when dissolved pour it into a flat dish, immerse the silk in this for a few seconds, and dry before a fire. To prepare the sensitising solution is also so ridiculously easy an operation as to cause any one to laugh when they see it done. Dissolve 60 grains of nitrate of silver in about $1\frac{1}{2}$ ounces of water. Place the same at an open window in a small white glass bottle, or in the sun, for a day or so. In a short time it will begin to discolour and throw down a dirty deposit (the organic matter present in the water). When it again becomes clear and bright it is ready for use. To sensitise, place in a flat dish. Say, for a quarter-plate size, of material about half a teaspoonful or less of the silver solution, and immerse the salted silk, or rather let the silk saturate itself with the silver solution. When equally saturated all over, dry again before an ordinary fire, and repeat this operation once, holding it from the opposite side during the second drying. If this is done fairly quickly in a room which is not too brightly lighted there will be no injury from the light, but it is well, if possible, to close the shutters, or use a room with gaslight. When dry the silk is ready for the printing frames.

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As to toning, some workers seldom tone at all. Let the printing be carried deeply, and then when the pictures come from the frames they receive a good washing in several changes of water, and are placed straightway into the hypo fixing bath. The whole operation is so easy, and so rapidly performed, as to cause surprise to those who have never seen it done. In some books of instructions the addition of gelatine or other similar matter for the salting solution is recommended, but on textile fabric working some photographers of our acquaintance got along best by using nothing but plain salt and water; and, seeing that the sensitising of a piece of silk can be accomplished in a couple of minute of time, it is not advisable or necessary to so prepare the nitrate of silver solution as will allow of the sensi-

tised silk being kept for any length of time before being used in the printing frames. Another great charm about pictures on silken fabrics will be found in the suitability of the colour to the nature of the subject. Moonlight effects are produced by using suitable negatives, and warm, rosy tints can be selected to suit other class of subjects. Any lady or gentleman who once takes to this class of work will not be long before he or she gets quite enthusiastic over it. Beginners should rest content with small sizes to start with; lantern plate negatives or quarter-plates are quite large enough, and with these sizes ordinary silken close texture materials are very suitable to employ. After a time larger sizes may occupy attention.

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THE printing of large photographs on silk (sizes, say, 12×10 or 15×12) is quite a different matter from manipulating tiny quarter-plate; and then provision has to be made for stretching the fabric, so that it lies flat in the frames. This is best done by stretching it to a sheet of cardboard, so that it will be sure to occupy the exact same place after being inspected during printing. For such large sizes a ribbed quality of material is perhaps the most suitable to employ. The material known as Bengaline is among the most useful samples. In selecting negatives for printing on silk, it will be found that bold, vigorous printers will throw the best pictures. Poor, thin negatives, in fact, are quite useless for this purpose, and the work should not be attempted with their aid. In printing of this description it will be found that much beauty is added at times by the employment of masks. This permits of a clear margin when desired all around the picture, and in some instances this is of value, for it must be borne in mind that, as a general rule, these pictures have eventually to be attached by means of needle and thread to their intended supports. For very small sizes, lantern masks do nicely; for other larger sizes, any photographic dealer will supply truly cut-out masks up to whole-plate size, and ovals, domes, or cushions can be selected according to the nature of the work the picture is intended for.

ACCURACY IN FOCUSING.

THAT accuracy in focusing is of the utmost importance in most branches of photography is well known to the merest tyro. Intimately associated with the operation is the nature of the apparatus employed. In landscape work the provision generally made in the shape of a sheet of fine ground glass, as supplied with ordinary cameras, suits the purpose well enough. Some experienced landscapists perform the operation in a rough and ready manner by marking on the baseboard of their cameras a series of lines, corresponding to the lenses they employ, and seldom resort to a close scrutiny of the image by means of a magnifier. Such a method of working, however, is out of the question in many branches of photography, where the utmost care is required to get the image in good focus. In portraiture we have a striking instance of the necessity of rendering aid to a lens by the adoption of a particular form of camera, which enables an operator to bring into a focus the varying planes of the sitter's image on the ground glass. As is well known, this is accomplished in first-class studios by introducing a certain amount of diffusion of focus in the lens by separating the back elements more or less, and in using the lens so

prepared, in conjunction with a special movable back in the camera that permits of the finest adjustments at top and bottom and both sides, by means of screw movements.

It is not only, however, in portraiture that we see special provision made in respect of focussing. We see the same thing necessary also in microscopy, and in some of what may be termed the higher branches of work, among which may be mentioned combination printing through the camera, and again, in a still more equally popular branch, the production of the sharpest possible images of negatives intended for projection by means of an optical lantern. In much work of this class, the ordinary ground glass of a landscape camera, and an ordinary double dark slide for exposing a sensitive plate, it may be said do not provide a sufficiently accurate means for focussing an image. No doubt camera-makers, as a rule, turn out their focussing screens as nearly as possible in a true plane with the rebates of their double dark slides; and, to enable a fair amount of nicety being arrived at, even in microscopic work with low powers, perhaps no better plan was ever suggested and given to the public than that of the late J. Traill Taylor, who, whenever an ordinary camera was employed in conjunction with a low power in microscopic work, advised having recourse to a very simple little dodge, in so doctoring the ground glass of a camera as to enable the finest degree of focussing to be performed by its aid, and this idea of Mr. Taylor's has been carried into effect by one or two of our very best camera-makers. It consists of having in the centre of the screen a small disc or circle of plane glass, and it may be remarked that this is easily added to any ground glass screen by drawing two lines from each corner of the focussing screen, so that they cross exactly in the centre. At the point where these lines cross, an ordinary microscopic cover-glass is cemented by means of a drop of Canada balsam, and when dry this will permit of the utmost degree of sharpness in focussing being performed, provided the dark cells are working true to the plane of the screen.

It is in this latter respect, however, that many outfits fall short, and where the utmost exactitude is required a double form of dark slide is not to be compared with a wet plate slide; the mere construction of the double form, very often with their protection plates a fixture, being quite unsuitable where delicate work has to be performed. A single wet plate form of slide (so seldom seen by amateurs nowadays) has many extremely good points in its construction. First, we have the folding door at the back, by means of which, when the shutter is drawn, any one can look right through from back to front of the camera. By this means much indoor work can be performed without ever removing the slide from the camera, and a focussing screen in the camera is actually not required for studio work of some kinds; whilst in the field, such a form of slide, when used in conjunction with a changing bag, will permit of plates being changed in a second or two with the greatest of ease, and it has often been a matter of surprise to us that some of our enterprising manufacturers have never made a speciality of pushing a slide of this description in conjunction with a changing bag. In indoor work, however, the great advantage of a wet plate slide lies in the fact that it provides a ready means for any one making certain that the image is in true focus; and, indeed, in combination work where such extreme nicety is required in registering one part of a picture to that of another, a slide of this descrip-

tion is absolutely indispensable. Take, for instance, the case of printing a combination lantern slide from two or more negatives. To perform an operation of this kind with a double form of dark slide would mean the withdrawal of the slide at least two or three times, and where such extreme accuracy is necessary so as to avoid even the semblance of overlapping (for it must be remembered such pictures have to be eventually magnified to an enormous extent on the screen), it is next to an impossibility to secure such accuracy when once a slide has been withdrawn to refocus and adjust another negative. How different, however, with a wet plate form of slide, which enables an operator to do the work and make as many exposures as he likes without ever withdrawing the slide at all. To accomplish this, by closing the shutters of his dark room, he can open the back door of his slide, and, by the aid of any simple little means he chooses to adopt for correctly registering the focussing screen and the sensitive plate, by merely pressing with the finger the ground glass tightly into the lower left-hand bottom corner, and doing the same with the plate he is exposing, make absolutely certain that the plate occupies the exact place desired. Of course, where such extremely delicate work has to be performed, some means has to be provided for marking the ground glass in the rebate of the dark slide at those parts where a junction of images has to be made. Sometimes ordinary ground glass will be found too coarse for this purpose, and then a piece of plane glass can be used instead, and the utmost nicety of focussing be performed with its aid also.

In microscopic work, again, a wet plate form of slide will prove invaluable in focussing with the aid of an ordinary eyepiece and low power objectives. One of the best methods adopted in microscopic work, when performed with what may be termed a practical home-made form of apparatus, consisting of a Zeiss microscope and whole-plate camera, padded well up on innumerable thicknesses of sheets of paper to prevent vibration, lies in employing a thin board of wood which corresponds to the ordinary thickness of the focussing screen. This sheet of wood has an aperture cut out exactly in its centre with a brace and bit seven-eighths of an inch in diameter. After the image has been roughly focussed on the ordinary ground glass, and the size required finally decided upon, the glass focussing screen is removed, the sheet of wood with its cut out aperture made to take its place in the wet plate slide. An eyepiece belonging to the microscope is now inserted in the cut out aperture. The camera by this means, after the microscope is inserted in its proper position in the front, becomes practically a draw tube added to the microscope, and then the enlarged image is focussed just as if the same were being done in the ordinary manner by means of the instruments without the camera. By this means those who have never performed their focussing without difficulty will be surprised at the ease with which they can secure accuracy. Of course, when this method of working is employed, all adjustments must be made with the microscope screw; the tail of the camera must not be altered.

Among the more practical branches of photography, where accurate focussing also plays a very important part, is that of enlarging. Here, again, we see the need of some special provision being made for making the most of a negative that is capable of being enlarged. In daylight enlarging there is no doubt much comfort in working with a lens of

large angular aperture, such as the Petzval Portrait Combination, for often in dull days, where the density of the negative and extent of enlargement are such as make it a difficult matter to see the enlarged image clearly, the utmost amount of light possible must be projected through the lens, which can be stopped down eventually during exposure of the sensitive material; and here, again, by adopting a system somewhat analogous to that already referred to by means of a wet slide, the utmost exactitude can be secured, for when a portrait combination is employed, and the easel has a small cut out aperture into which a sheet of the finest oiled ground glass, or even a sheet of plain glass, the focussing is finally performed with a certainty that the most has been made out of the negative. When working at very close quarters on such subjects as flowers and plants, it is often a matter of the greatest difficulty to bring those arranged at the rear in a fairly equal focus to those in the front. One dodge is to do this kind of work by means of a mirror, and, if the disposition of the mirror to the object is such as it ought to be, the double surface image objection to the use of mirrors, which we hear so much about at times, will be unnoticeable to nine out of ten observers.

Carriage of Gas Cylinders.—The lantern season is now on, and many are now interested in knowing how they are to get their supply of oxygen in cylinders, for the railway companies do not appear as yet to have relaxed any of their restrictions with regard to their conveyance. We note that the District Railway have re-posted their notices to the effect that cylinders of compressed gases will not be conveyed as passengers' luggage or otherwise, nor will the cylinders be allowed on the Company's premises under any conditions whatever. When reading the notice we could not help speculating as to whether the Company did not very frequently convey cylinder of compressed gas as personal luggage? We can answer for it that they have done so, and possibly will do so many times again. One or a couple of two-feet cylinders will go very well in a leather Gladstone-bag which is easily carried in the hand, and the railway company be none the wiser. It would probably be wiser, perhaps, if they permitted the cylinders to be conveyed openly in the luggage van, for, if there were any danger in the carriage of them, there would be more safety there than amongst passengers. Of course there is no danger at all with them, owing to the precautions now taken by the compressors. The difficulty of the conveyance of gases it may be mentioned, is overcome to a great extent by the manufacturers, for they are fully aware of the restrictions, and the conditions of the different railway and carrying companies, and conform to them. Therefore any one ordering need have no anxiety as to the receipt of what he requires. But, as a bit of advice, we should recommend that the gas be ordered some days before it is actually required for use, in order to ensure its being received in time, because, owing to stupid restrictions, it may be delayed in transit. What is more vexing than that, at the time fixed for a lecture or entertainment, the gas has not arrived?

The Approaching Star Shower.—At the meeting of the British Astronomical Association, last week, Dr. Downing said that, in conjunction with Dr. Stoney, he had been engaged upon computing the perturbation to which the swarm of Leonids had been subject during the last revolution in their orbit, viz., in the last thirty-three years. These investigations, he said, were with special reference to the approaching shower, if we have one. It will be remembered that last November a very brilliant display of the Leonids was expected, and many prepared to photograph them, but they did not arrive. It was then said by astronomers that they would probably be seen this year. Dr. Downing does not seem to be

ery sanguine, however, that they will, but advises that a watch should be kept for them on the nights of the 13th, 14th, and 15th. The most probable time to see the display will be about three a.m. on the 15th. If the missing shower of last year should turn up this, there is a better chance of seeing and photographing it than there was then. Last year, at the time it should have arrived, the moon was at about its full. This year it will have passed its last quarter, so that photographers will have a better chance, if they put in an appearance, than they would have done if they had arrived at the computed time last year. Anyhow, as the really brilliant display of the Leonids only occurs every thirty years, those interested in photographing them should be prepared on the nights mentioned to catch them as they pass.

The Great Explosion in New York.—The City of New York has been the scene of a terrific explosion which, in its force and disastrous effects, seems to have been somewhat like that which occurred at St. Helen's not long back. At present the cause of the explosion appears shrouded in mystery. One account says it was due to a barrel of turpentine and fifty pounds of collodion exploding. Now, neither turpentine nor collodion would explode, they would take fire and burn, the latter with great violence. The vapour from either, however, would explode if mixed with a certain proportion of air, the collodion with more violence than the turpentine, but we doubt if with sufficient force to cause all the damage that resulted. A later account says that large quantities of chlorate of potash and sulphur were stored on the premises. It will be remembered that the explosion at St. Helen's was due to chlorate of potash, though, up to that time, it was thought that that material, by itself, was perfectly harmless, even when subjected to great heat. But it was proved by experts that under certain conditions it was a dangerous explosive. A mixture of chlorate of potash and sulphur, we all know, is highly explosive, but it is scarcely likely that these materials would be kept mixed in any warehouse. So, up to the present, the actual cause of the disaster has not been determined.

Abolishing the Studio.—A regular contributor to one of the leading illustrated weeklies recently suggested that it was high time that the professional photographer's orthodox studio was abolished. In his opinion, the portrait obtained as the result of a formal sitting in a studio did not come up to, in point of naturalness, that obtained from an enlarged snap-shot, taken unbeknown to the person, and he suggests that methods should be adopted to secure more naturalness in expression and pose. Similar suggestions have, of course, been made before; and professionals will probably themselves admit that many of their most successful portraits have been the result of an exposure made when the sitter has had his attention momentarily diverted from the matter in hand. The knowledge that they are being photographed is to many people disconcerting; but one would not care to argue from this that the studios should give place to an open-air garden or a brilliantly lighted room in which several assistants, armed with hand cameras, are secreted ready to snap the unsuspecting person as he enters, this being the method proposed to secure a more lifelike and natural expression. From the several snap-shots taken, enlargements are to be made, and one or two of the most pleasing finally selected. This scheme may have its advantages, but it could hardly be recommended on the score of economy. Not infrequently an amateur succeeds in securing a portrait, taken in homely surroundings, which, though possibly technically inferior, has some attractions which the professional photograph taken in the orthodox studio does not always possess. But this particular picture which pleases may be one of many the majority of which may be anything but satisfactory. The average professional has to obtain, or is expected to obtain, a satisfactory portrait at a minimum cost, and he cannot afford to experiment with his sitter. Theoretically, perhaps, he should not require or desire to.

MARIOTYPE: A CARBON PROCESS WITHOUT TRANSFER.

THE Mariotype process is probably unknown, even in name, to the greater number of modern photographers. It is a modified carbon process in which the image is a visible one and is not reversed, so that no second transfer is required to make it correct as regards right and left. In this process a very interesting principle is involved. It is now pretty generally understood by every one that the action of light once started in a bichromated gelatine film, such as carbon tissue, continues to progress after it is removed from the light and kept in perfect darkness. The action set up by the light on the surface seems to penetrate deeper and deeper into the gelatine, thus rendering a thicker layer of it insoluble than would exist if pictures were developed directly it was removed from the negative. It is for this reason that carbon prints, unless they are developed soon after they are printed, will turn out darker than they were intended to be. Therefore allowance has to be made for that by printing them lighter in the first instance if they have to be kept for any length of time.

As an illustration of this fact, a print may receive but a third of the exposure that would have been required if it were developed at once, yet, by keeping it long enough, it may be developed as a fully printed picture; or, by still longer keeping, an over-exposed one. The time this will take will vary according to circumstances. It may take six, twelve, twenty-four, thirty-six or more hours, or it may take much less than even six hours. Under other conditions the prints may be kept for many months without any change whatever. The presence or absence of moisture in the tissue is the governing factor.

For example, if prints after exposure be thoroughly desiccated, and kept so by being sealed up in an air-tight metal or glass tube, they will remain unchanged for months, both as regards their depth and the solubility of the tissue. I have kept exposed prints under these conditions for six months, and, although only half printed when put away, they had gained nothing in depth by the long keeping, and the tissue was as soluble as it was at first. On the other hand, if the partly exposed pictures—say one fourth the normal—are kept in a moist atmosphere, at a warm temperature, 75° F. for example, they can be developed in an hour and a half or so as fully printed pictures, or, if kept an hour or so longer, they will prove very much overprinted, possibly quite ruined. The reason why I refer to this here is that what is to be described later on may the better be understood.

This continuing, or "continuating action of light," as it is usually termed, was well known to the very earliest workers of the carbon process, indeed it would have been impossible for any observant worker not to have been cognisant of it. But at that period it was not known that the action of light set up in one bichromated film could be communicated to, and continued in another one that had not been exposed at all, by its being merely kept in close contact with it for a certain time.

It was the late M. A. Marion, the founder of the well-known house of Marion & Co., Soho-square, who first demonstrated this fact, and worked out a practical process based upon it. The process he named "Mariotype," and he described and demonstrated it before the London—now the Royal Photographic Society—in 1873. M. Marion's process was this. He took paper thinly gelatinised, but in the paper which he read before the Society he said that it would be better to have it albumenised, warped, and gelatinised. I am now quoting from that paper, which was published on page 242 of the JOURNAL for 1873. The prepared paper is floated on a six per cent. solution of bichromate of potash, to which a "little" sulphuric acid has been added, for about a minute, and dried. It is then ready for printing. It is exposed under the negative until the details of the picture are fully out. Then a piece of unsensitised carbon tissue is taken and immersed in a two per cent. solution of bichromate of potash till softened. It is then squeegeed on the printed picture, in the same way as ordinary exposed carbon tissue is mounted upon the support prior to development. Then it is placed between blotting-paper, under pressure, to prevent its drying, for from eight to ten hours. It is better, M. Marion told us, to deal with a number of prints at a time, so that they could be stacked one on the other, and thus more effectually prevent their drying. Under these conditions the

continuation of the solarisation goes on by transmission to the tissue, for, when it comes to be developed, it is found to be fully printed.

After the prints have rested for the necessary time—and more recent knowledge tells us that that is largely dependent upon the temperature at which they are kept—the prints are put into warm water at a temperature of from 40° to 50° C., say 105° to 120° F., when after a short time, the back of the tissue can be stripped off and the print developed exactly as in case of an ordinary carbon picture. Now, it will be seen that with this process we have a visible image to begin with, which is a guide to the right exposure, and, as the print is a direct one, a reversed negative or a second transfer, is not required to have the picture correct as regards right and left. Such is the process of the late M. Marion.

At the time it was published I made some experiments with the process, and satisfied myself that it was a perfectly practicable one but, as it did not seem to me to offer any real advantages over the ordinary carbon process for every-day work, I did not proceed further with them. Having recently, as a matter of business, had to make some researches in connexion with bichromated gelatine processes, in which the continuing action of light is indirectly concerned, I was led to give some attention to the Mariotype process, and I found that, by a very slight modification of it, the time of keeping the prints after the tissue is applied could be considerably curtailed. From eight to ten hours it can be reduced to from an hour and a half to three hours, or less, according to temperature. Instead of sensitising the paper on a six per cent. solution of bichromate of potash containing sulphuric acid, I have employed one of greater strength (seven and a half per cent.), and in a neutral or alkaline condition. The solution used for mounting the tissue on the exposed paper is also a little stronger, and is acidified. For the benefit of those who may be sufficiently interested in the process to experiment with it I here subjoin the formula, and method that has worked well in my hands, as it may save them some time at the beginning.

Any good paper that will stand soaking in warm water can be used. That I have employed is a Steinbach paper, such as is used for bromide and similar papers. It is coated with a warm two per cent. solution of gelatine. The gelatine I employed was Creutz's "soft." The simplest way of coating the paper is by floating it on the solution for a few seconds, then it is hung up to dry. When dry it is ready for sensitising. The bath I found to answer well is as follows:—

Water	1 litre.
Bichromate of potash	75 grammes.
Liquor ammoniæ about	5 c. c.

Or

Water	40 ounces.
Bichromate of potash	3 "
Liquor ammoniæ about.....	3 drachms.

An excess of the ammonia does no harm, as it flies off as the paper dries. The paper is sensitised by floating it on the solution for a couple of minutes or so. It is then hung up to dry, in the dark of course, when it is ready for printing. The negatives I have found most suitable are those of medium density and contrasts, although there is some scope for ameliorating or increasing the contrasts, as I shall point out presently. The printing should be carried sufficiently deep for all the details in the lighter portions of the picture to be distinctly seen, the image being brown over pale lemon-coloured ground. The printing will take a somewhat longer time than is the case in the usual carbon process. When printed, a piece of carbon tissue (unsensitised) is taken and immersed in the acid solution of bichromate of potash. The following I have found suitable:—

Water	1 litre.
Bichromate of potash	25 grammes.
Acetic acid (glacial)	35 c. c.

Or

Water	40 ounces.
Bichromate of potash	1 ounce.
Acetic acid (glacial)	10 drachms.

As soon as the tissue has softened (but not so much as is usual in mounting exposed carbon tissue on its support) a print is slipped under it, in the solution, and the two removed and well squeegeed together. It is then put under pressure between two glass plates to prevent its drying. Where a number of prints are dealt with at a time, they are, of course, placed one on the other between the glasses, and are thus prevented from drying, for they must be kept with a certain amount of moisture in them. They are then kept in this condition for the required time, which may be from one and a half to three hours, or more, according to the temperature. The warmer it is the more rapid is the continuing action, and the longer the prints are left the darker they will become. If they are left much too long, they will be difficult to develop and will require very hot water.

When it is judged that the continuing action has been sufficiently long, the prints are soaked in cold water, with two or three changes, for about half an hour, to get rid of most of the free bichromates. That, however, is not necessary, but I have done it for the reason that my skin is, unfortunately, somewhat sensitive to the bichromate. The prints are put into warm water at a temperature of from 110° to 115° F. when, after a short time, the paper backing of the tissue can be stripped off and the development proceeded with just as in the usual method of carbon working, by washing away the unaltered pigmented gelatine. When sufficiently developed, the prints are washed in cold water and then put into the ordinary five per cent. alum solution till all traces of the bichromate are removed; the pictures are then finished.

If the backing of the tissue does not strip off easily after the prints have been soaking in the warm water for five or six minutes, the temperature of it should be increased, and if it does not then strip it is an indication that the time of keeping has been overdone. The prints may, possibly, yet be saved by removing them from the warm water to cold, to which has been added a little liquor ammoniæ, and allowing them to remain in that for about a quarter of an hour or longer. They may then be replaced in warm water, when they will probably develop quite freely.

Just now I said that there was scope for enhancing, or ameliorating, contrasts in the prints. If there are too strong contrasts in the negatives, the prints should be somewhat strongly printed in the first instance, and the time of keeping after mounting curtailed. If, on the other hand, the negative is weak and flat, the print should be more lightly printed, and a longer time allowed for the continuing action, as that has a tendency, by going more deeply into the pigmented gelatine, to increase contrasts.

In the foregoing I have given the formulæ and method that has worked satisfactorily in my hands, but I do not pretend to say they are the best. The best can only be arrived at by a long series of tentative and exhaustive experiments, which my time will not permit of at present, particularly as this modification offers no special advantages to me, at least, over the ordinary carbon process with which I am quite *au fait*. The process may, however, be useful to some, inasmuch as there is a visible image as a guide to exposure, and, as the print is a direct one, there is no reversal of the image, and consequently no retranfer to get it the right way about. From a scientific point of view, however, Mariotype is a very interesting process, as illustrating how the action of light, set up in one bichromated gelatine film, can be transmitted to a second one that has not been exposed to it in any way, and the same results obtained as if it were.

I should mention that the tissue I have employed has been the ordinary commercial tissue as supplied by the Autotype Company and others; but, from my knowledge of the carbon process, I should say that such is not the most suitable for Mariotype. One containing more pigment and a larger proportion of sugar in its composition would, I think, be preferable. That, however, is but conjecture, as I have not had time to make a tissue specially for the purpose, so as to speak positively on the subject.

E. W. FOXLEE.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHEMISTRY.

III.—LORD RAYLEIGH (1887) AND OTTO WIENER (1889).

In a paper "On maintained vibrations," * Lord Rayleigh had briefly treated a subject to which his attention was recalled by Glaisher's Address to the Astronomical Society, † in which was an account of the treatment of mathematically similar questions in the Lunar Theory, by Hill ‡ and by Professor Adams. § Though Hill's analysis was in many respects "incomparably more complete" than Rayleigh's, yet Hill's "devotion to the Lunar Theory" led him to pass by many points of great interest which arise when his results are applied to other physical questions. In a paper, dated June 19, 1887, "On the Maintenance of Vibration by Forces of Double Frequency, and on the Propagation of Waves through a Medium endowed with a Periodic Structure," || Lord Rayleigh took up the question again.

The equation of motion of the vibrating body may be put into the form:—

(1.)

$$\frac{d^2w}{dt^2} + 2k \frac{dw}{dt} + (\theta_0 + 2\theta_1 \cos 2t) w = 0$$

Hill's method was applied to this equation, and, besides, it was shown that the same method is applicable when the co-efficients of

$\frac{d^2w}{dt^2}$ and $\frac{dw}{dt}$, as well as of w , are subject to given periodic variations. ¶

We may write—

$$\Phi \frac{d^2w}{dt^2} + \Psi \frac{dw}{dt} + \Theta w = 0,$$

where

$$\Phi = \Sigma \Phi_n e^{2int}, \Psi = \Sigma \Psi_n e^{2int}, \Theta = \Sigma \Theta_n e^{2int}.$$

Assuming $w = \Sigma b_n e^{ict} + 2int$, we obtain, on substitution, as the coefficient of $e^{ict} + 2int$:

$$(2.) - \Sigma b_n (c + 2n)^2 \Phi_m - n + i \Sigma b_n (c + 2n) \Psi_m - n + \Sigma b_n \Theta_m - n$$

which is to be equated to zero. The equation for c may still be written $\mathfrak{Q}(c) = 0$ (a determinant analogous to that introduced by Hill in the same notation). Some special cases were then considered, and an application made to a stretched string which is periodically loaded and which propagates transverse vibrations. **

"One of the most interesting applications of the foregoing analysis is to the case of a laminated medium in which the mechanical properties are periodic functions of one of the co-ordinates. I was led to the consideration of this problem in connexion with the theory of the colours of thin plates. It is known that old superficially decomposed glass presents reflected tints much brighter, and transmitted tints much purer, than any of which a single transparent film is capable. The laminated structure was proved by Brewster; and it is easy to see how the effect may be produced by the occurrence of nearly similar laminae at nearly equal intervals. Perhaps the simplest case of the kind that can be suggested is that of a stretched string, periodically loaded, and propagating transverse vibrations. We may imagine similar small loads to be disposed at equal intervals. If, then, the wave-length of a train of progressive waves be approximately equal to the double interval between the loads, the partial reflexions from the various loads will all concur in phase, and the result must be a powerful aggregate reflexion, even though the effect of an individual load may be insignificant."

* Phil. Mag. [5], xv., April, 1883, 220.

† Monthly Notices, February, 1887.

‡ "On the Part of the Motion of the Lunar Perigee which is a Function of the Mean Motions of the Sun and Moon"—Acta Math., viii., 1886; Jahrbuch über die Fortschritte der Math., 1886, 1106.

§ "On the Motion of the Moon's Node, in the case when the orbits of the Sun and Moon are supposed to have no Eccentricities, and when their Mutual Inclination is supposed to be indefinitely small"—Monthly Notices, November, 1877.

|| Phil. Mag. [5], xxiv., August, 1887, 145-159; Jahrbuch über die Fortschritte der Math., 1887, 1068-1069.

¶ Loc. cit., p. 151.

** Loc. cit., p. 156.

Rayleigh found that a wave travelling in either direction is ultimately totally reflected, and this does not require a special adjustment between the frequency of the waves and the linear period of the lamination; and he finally remarked, in a note:*

"A detailed experimental examination of various cases in which a laminated structure leads to a powerful but highly selected reflexion would be of value. The most frequent examples are met with in the organic world. It has occurred to me that Becquerel's reproduction of the spectrum in natural colours upon silver plates may perhaps be explicable in this manner. The various parts of the film of sub-chloride of silver with which the metal is coated may be conceived to be subjected, during exposure, to stationary luminous waves of nearly definite wave-length, the effect of which might be to impress upon the substance a periodic structure, recurring at intervals equal to half the wave-length of the light; just as a sensitive flame, exposed to stationary sonorous waves, is influenced at the loops, but not at the nodes. † In this way the operation of any kind of light would be to produce just such a modification of the film as would cause it to reflect copiously that particular kind of light. I abstain at present from developing this suggestion, in the hope of soon finding an opportunity of making myself experimentally acquainted with the subject."

In this note, after Mascart, ‡ the idea of "stationary waves," appears to have been first emitted. Mascart had previously § attributed this to Wiener, who developed the notion rather more explicitly, and, apparently, independently of Lord Rayleigh. We propose to give an account of Wiener's (1891) memoir.||

The experiments of Hertz ¶ on the nodes and loops of electric oscillations before a plane conductor, analogous to the effects of the reflexion of sound on a wall, gave Otto Wiener the idea of seeking if it were possible to show the interferences which should exist between the luminous waves which fall on a mirror and the reflected rays.

Suppose, in a more general manner, ** that the mirror is covered with a transparent layer of index n . For an exterior incidence i , the incidence i' on the mirror is $\sin i = n \sin i'$; the 'lag,' (la différence de marche) of the incident and reflected waves at the distance e from the surface is $2ne \cos i'$ and the corresponding difference of phase $\delta = 2\pi \frac{2ne \cos i'}{\lambda} = 4\pi \frac{e \cos i'}{\lambda'}$, where λ' denotes the wave-length in the layer.

If the primitive vibration is perpendicular to the plane of incidence and of amplitude a , the amplitude of the reflected vibration is $a h$; calling α the loss of phase due to reflexion, the vibrations to be compounded are of the form $a \sin \omega t$ and $a h \sin (\omega t - \alpha - \delta)$ (h supposed positive).

The maxima of intensity correspond to the values $\alpha + \delta = 2m\pi$ and the minima to the intermediate values $\alpha + \delta = (2m+1)\pi$. The ratio of the difference of the extreme intensities to that of the maxima is

$$p = \frac{(1+h)^2 - (1-h)^2}{(1+h)^2} = \frac{4h}{(1+h)^2}$$

The common distance d of two successive maxima or minima is $\frac{\lambda'}{2 \cos i}$; half this value represents the distance from a minimum to the following maximum. Finally the distance d_1 from the first minimum to the surface is $\frac{\lambda'}{4 \cos i} \left(1 - \frac{a}{\pi}\right)$.

* Loc. cit., p. 153.

† Phil. Mag., March, 1879, p. 153.

‡ Traité d'Optique, iii. (1893), 681.

§ Ibid., ii. (1891), 5 and 4, 1. 7.

|| "Stehende Lichtwellen und die Schwingungsrichtung polarisierten Lichtes," Wied., Ann., xl. (1890), 203-243; Mascart, ii., § 625 (Interférences des rayons incidents et des rayons réfléchis), 572-577. Wiener's paper was communicated in an extract to the 62 Versammlung deutscher Naturforscher und Aerzte, 1889 (Tageblatt der Versammlung, p. 209).

Together with a paper by P. Drude ("Bemerkungen zu der Arbeit des Herrn O. Wiener . . ."; Wied., Ann., xli., 154-160), this memoir was noticed in the Jahrbuch über die Fortschr. der Math., 1890, 1033-1036 (Wangerin).

¶ Wied., Ann., xxxiv., 1888, 609. Hertz thus determined the phase-variation due to reflexion of electric vibrations.

** The following investigation is due to Mascart (loc. cit.).

When the primitive vibration $b \sin \omega t$ is in the plane of incidence, the reflected vibration is of the form $bk \sin(\omega t - \beta - \delta)$; it makes with the incident vibration an angle $2i'$ (if it is counted so that its projection on the surface is in the same sense as that of the incident vibration). Their resultant is elliptic in general and the sum of the squares of the axis is (Mascart, § 163) :—

$$A^2 + B^2 = b^2 [1 + k^2 + 2k \cos 2i' \cos(\beta + \delta)].$$

The maxima and minima correspond to the conditions $\beta + \delta = 2m\pi$ and $\beta + \delta = (2m+1)\pi$; the first gives the maxima or the minima as $\cos 2i'$ is greater or less than 0.

The distance of two successive maxima or minima and their respective distance have the same expressions as before. Finally, the ratio of the difference of the extreme intensities to that of the maxima is :—

$$q = \frac{4k \cos 2i'}{1 + k^2 + 2k \cos 2i'} = \frac{4k \cos 2i'}{(1 + k)^2 - 4 \sin^2 i'}$$

Apart from the rôle of phase losses on the surfaces and the relative intensity of the interfering rays, these conditions are exactly the same as for coloured rings.

For normal incidence, in particular, one must make $a = \pi$ in Fresnel's theory (at least in what concerns vitreous reflexion), and $a = 0$ in MacCullagh and Neumann's. The one or the other of these two theories will then be verified according as the surface is a maximum or a minimum.

When the vibrations are normal in the plane of incidence, the interferences can only disappear if the factor h becomes zero. If they are comprised in the plane of incidence, the interferences vanish, whatever the factor of reflection, for $\cos 2i' = 0$ or $i' = 45^\circ$, i.e., when the incident and reflected rays are perpendicular to one another. For the vibrations to be compounded are then rectangular and the intensity is independent of their phase-difference.

These localised interferences were called "stationary waves" (stehende Wellen), by Wiener. For the experimental details of Wiener's work (which do not any more concern us) we refer to Wiener's paper and Mascart (*op. cit.*, pp. 574-576); for the consequences on Drude (above), and Cornu, Poincaré and Potier (*Compt. Rend.*, cxii., 1891, 186, 365, 383, and 456).

It is interesting to note that Wiener refers * to Zenker.

"The only one, so far as I have followed the literature of the subject, who has explicitly used standing light-waves for the explanation of certain phenomena, is Zenker. In his book on Photochromy he seeks to explain the reproduction of natural colours with silver chloride by means of standing waves. The objections of Schultz-Sellack † are to my knowledge not yet set on one side. The solution of this question would certainly be of great charm; not less that, in how far standing waves could be made useful for the problem of photography in colours."

PHILIP E. B. JOURDAIN.

Cambridge, October 24.

P.O.P. IN INDIA.

I HAVE always thought it a pity that such a beautiful paper as the P.O.P. should be found unworkable by most people during the hot season in India. Amateurs who use only P.O.P. for printing on have, since its introduction, invented a new season, which we never heard of when albumen paper was the only one used, I refer to the photographic season. This season, of course, corresponds with the cold season. For my part I have found the paper perfectly workable all the year round, the paper is fairly durable, the tones which it allows of are exceedingly beautiful, the picture is as permanent as with albumen paper, and any amount of gloss can be obtained in a very simple manner. The reason why we hear so much of P.O.P. troubles is that it is comparatively a new paper, and enough has not yet been written as to how to work it. I hope this article will help to remove most of the difficulties we hear of so often.

1. In India, with the temperature over $100^\circ\text{F}.$, the paper often gets bone dry and hard. In this case the roll must be removed from the pasteboard tube, and without manipulating the papers in any way,

* *Op. cit.*, 205.

† *Pogg. Ann.*, cxliii., 1871, 449.

the roll should be left in a damp room for some days until the roll opens out of itself, and the papers become limp enough for working with. I have often used by bathroom for the purpose. When the papers have become limp enough, they should be rolled up and kept in a tin tube to prevent them drying again. Of course, the damp room should be darkened before exposing the paper in it.

2. In the rainy season, on the other hand, the paper sometimes get too damp and tacky. In this case the papers should, each one, be once opened out and left to dry in a warm, darkened room. When the tackiness has quite disappeared the papers must be rolled up and kept in a tin tube. In either of the above two cases the paper must not be refused, because the fault is with the climate, and not with either the paper or the dealers. If, however, the paper arrives at all discoloured it must either be refused or thrown away, because it is never satisfactory to work with old discoloured P.O.P. In hot climates P.O.P. discolours faster than in cold.

3. For India and other tropical climates, tin tubes are more suitable than the usual pasteboard ones, but the lid need not be soldered on, an elastic band or waterproof paper round the joint being sufficient. The fumes caused by soldering may perhaps prove injurious to the paper.

4. While cutting up the paper for use the fingers must not touch the gelatine surface, or stains may form. Any wooden, bone, or ivory paper-knife will do for cutting up the paper into the sizes required. A steel knife, which might contain rust, should not be used.

5. The printing must not be carried on in direct sunshine, but under the diffused light from a broad expanse of sky. The printing should be continued until the shadows are buried in obscurity, and the high lights, such as a shirt front, or cuffs, look slightly, yet distinctly gray. Most beginners never print deep enough, and I would recommend such to print a few papers to an extent which they would consider altogether too much, and the chances are that those will turn out the finest and best toned ones of the batch.

6. The quality and tone of the prints always depend chiefly on the character of the negative. A thin over-exposed negative can only yield feeble and badly-toned prints. A negative which cannot show a lamp-post through the densest parts if held up and looked through is made too dense to print well. If the negative be placed on a sheet of pure white foolscap paper the paper should not show pure white in patches, but even in the deepest shadows should look more or less grey. This means that there should not be clear glass anywhere. If the negative answers to the above tests, and looks sparkling and full of life when held up against the sky or other very bright light, it will certainly yield good and nicely toned prints. But there should be no sparkle about the negative if seen through against the white walls of a room or other mildly-lighted object.

7. As this article has no concern with the development of a negative, I will not enter much into that subject, but will just give one hint here which will help the beginner very much. My advice is that you should never once during development remove the negative from the ebonite developing dish in order to hold it up against the lamp to examine it for density. While actually developing a negative no thought whatever should be given to density. We must simply watch the progress of the shadows, viz., the white patches as they appear in the dish, and keep on developing until the whitest patch begins to look greyish and distinctly darker than the white margins of the plate. When this has happened the plate should forthwith be washed. If by this mode of development we find the high lights have turned out too dense, that simply shows that the pyro-soda, or any other developer used, was made too strong, and we should dilute it with half its bulk, or even more, of water, and try again. The density will be probably correct this time, and a fine, good printing negative result. In this way the mode of altering the developer to suit the negative will soon be learnt, so that nothing could be left to chance. The only proper time to think of the density of your negative is when you are making the exposure, and preparing your developer. But when actually engaged in the development of a negative your sole and undivided attention should be given to the sufficient and accurate development of the shadows.

8. The best time for trimming the prints is immediately after taking them out of the printing frames. This will give them clean edges, which will prevent prints tearing and scratching each other in the after processes, and the removal of the black edges will save a lot of gold in the toning bath; if the black edges be left they will eat up all the gold, and leave none for the prints. The trimming should be done in very subdued white light, or preferably yellow light or lamp light, and the trimming shapes could be easily made at home of the exact sizes required out of a sheet of pale yellow glass, with the help of a glazier's diamond.

9. In cold climates the first washing of the prints can be carried out as directed by the makers. The only things to be remembered are that no accidental splashes of water should fall on the prints before actual immersion, and that no prints should be allowed to remain for any length of time in water which the prints have rendered milky. The first few changes of water must therefore be more rapidly made than the last few, as the latter do not get so quickly milky. This first wash must be very thorough, about six changes being sufficient.

10. If, however, as during the hot season in India, the temperature ranges from 90 to 110°F., the above mode of washing would never do, as the gelatine would dissolve in the very first change. Ice must then be employed, and I use it as follows: I arrange five good-sized dishes in a row, the first four containing water, and the fifth a solution of chrome alum of the strength of one grain to each ounce of water. I also have a jug at hand full of water. In all the dishes and in the jug I put lumps of ice, sufficient to bring the temperature down to below 60°F. I then pass the prints through all the dishes until the fifth is reached. The water in the first dish is thrown away, as it gets milky, and is replaced by the cold water in the jug from time to time. Whilst I attend to the first dish, an assistant attends to the prints in the other dishes, and keeps them constantly moving about. The prints are gathered together in the water, the whole lot of them lifted out together and dropped into the next dish, and there separated and kept on the move. With very high temperatures it does not do to lift up each print singly to transfer it to the next dish, as the gelatine softens by contact with the heated air. The prints lie in the chrome alum bath for 20 minutes, by which time they will be so thoroughly hardened that all the subsequent manipulations could be leisurely carried on with uncooled water or solutions without the least fear of the gelatine softening. The film can, in fact, now be vigorously rubbed between the fingers without in any way injuring it. After the chrome alum bath two or three changes should be given to wash out the alum thoroughly, and then the prints are dropped into a salt water bath made to taste distinctly briny (about 1 to 30 ounces), and kept there till they become lobster red. They are then again washed in two good changes, and then are ready for toning.

11. I have mentioned above that one grain to the ounce chrome alum solution should be used. In very hot weather I dissolve the chrome alum powder in iced water, as then I get it exactly one grain to the ounce, whereas adding lumps of ice to the prepared solution dilutes it, and renders it less effective. Adding a larger proportion is useless, and merely makes the solution more green, which then might slightly stain the prints a faint green colour. Besides, adding more chrome alum tends to soften the prints instead of hardening them. I once arranged a number of glasses in a row containing uncooled solutions of chrome alum varying from $\frac{1}{2}$ a grain to 10 grains to each ounce. I then kept strips of unwashed P.O.P. in each glass for 15 minutes, and noted down the results. Half a grain was fairly efficient; 1 grain thoroughly efficient; $1\frac{1}{2}$ grains very slightly more so, but the solution was greener; at 3 grains the film was soft; at 4 still more so, and at 5 grains to the ounce the gelatine was so rotten that the least touch with the finger rubbed it off the paper. This result astonished me at the time, but the explanation probably was that the stronger solutions hardened the surface of the gelatine to such an extent as prevented the alum acting on the deeper layers of the film, which thus softened under the influence of heat and moisture, and made it leave the paper support. As mentioned above, the solutions used in the experiment were not cooled, and possibly the results would have been different had cooled solutions been employed. But in no case can it be necessary to use stronger solutions than one grain to the ounce. Formalin could, of course, also be used, but for hardening prints would be much more expensive, I believe, than a chrome alum solution of the strength I have recommended.

12. In paragraph 10 I have mentioned that the prints should be gathered up together, and the lot transferred at once to another dish. The prints will have by this method all stuck together, and the beginner will be at a loss to know how they are to be separated without lifting each print out of the dish. Even if the weather be cool, and lifting each print out of the water be therefore unobjectionable, it would soon ruin the prints if finger-nails, toothpicks, or pen-knives were constantly to be used to start the separation of each print by one of its corners. The prints must always be induced to separate themselves without our having even to touch them. This is done by using dishes much larger than the prints, so that when the prints are all pushed to one side of the dish, there is a space of two or three inches on the opposite side of the dish. A certain splashing movement made in the water with the fingers in that space is all that is needed. The four fingers are put into the water edgeways at the end of the space nearest to us, and with a rapid movement from the wrist, carried

through the water with a splashing movement up to the top end of the space. This movement is to be rapidly repeated, always in the same upward direction, until the prints float up and separate from each other. The prints will at the same time come floating towards the fingers making the movement, and when they come quite near a space will be left on the opposite side of the dish, where the movement must then be repeated with the fingers of the opposite hand. Thus the prints will not only be kept separate, but constantly on the move from one side of the dish to the other. Any two refractory prints which refuse to separate by this method must at once be brought to the surface, and carefully separated with the fingers. In this connection I may add that when we wish to remove a print from water or any solution singly, it is always best to make it float up first before laying hold of it. To make a print float up to the surface all that is needed is to rub the surface of the water, &c., from side to side with a quick splashing movement with the flat palm of the hand.

13. The toning may be done with the formulæ recommended by the makers if the results satisfy you. If the tones are not satisfactory, and red tones or double tones result, then other formulæ could be tried. The formula to be used will depend entirely on the kind of tones you personally prefer. A friend of mine thought his own formulæ first-rate, because in his views the near trees looked red and the distant ones blue! I advised him to stick to his formulæ as the results pleased him. For my own part I like a formulæ which will never give double tones, and one which will tone up to a fine purple black. To produce such a tone the negative must be a vigorous one, the printing carried to the degree I have recommended in paragraph 5, and the chloride of gold the purest and most expensive obtainable. After spending so many pounds sterling in lenses and cameras, it can never be wise to try to save a few pence in chloride of gold. I always prepare my own chloride from Chinese leaf gold. If prepared with an English sovereign the solution is green, instead of a fine golden yellow, and it gives extra trouble to remove the chloride of copper which it contains. My toning formulæ is as follows:—

Pure rain or distilled water	8 ounces.
Sulpho cyanide of ammonium	30 grains.
Chloride of gold	2 grains.
Bicarbonate of soda	2 grains.

The ingredients are mixed in the order above given. The sulpho-cyanide I keep as a 30 grains to the ounce solution, and the gold as a grain to the drachm solution. I therefore begin by taking 6 ounces of water instead of 8, and when all is mixed I bring the whole up to 8 ounces. If the solution be placed in a tumbler it looks yellowish when first prepared, but if kept exposed to light it soon loses that colour, and looks like water. When that happens, toning should be begun at once. The above quantity will tone a little more than half a sheet of P.O.P., how much more depending entirely on the character of the prints. Vigorous prints take up much gold, while delicate vignettes take up but little. In any case the above formulæ will tone to a fine black, or some shade of black, and double tones will never occur with it. It tones so fast that only one large, or about four small prints, are toned in it at a time. The prints are lifted out of the toning bath from time to time, and looked through against mild daylight or bright lamp light. The moment all the redness has disappeared from the soft shadows, and a little redness still remains in the deepest shadows, the print is at once popped into the salt bath referred to in paragraph 10. If a sharp look out be not kept, and the toning continued until all the redness, on looking through the print, has disappeared from even the deeper shadows, the print has been over-toned, and will not look bright when finished. I have used the word "redness" and not "warmth" as in the maker's directions, because warmth is a technical expression not understood by everybody, especially in India. If several sheets of P.O.P. have to be toned, I prepare a solution in which all the ingredients are double that shown in the formulæ, making 16 ounces in all. When the bath works slow, and seems pretty well exhausted, which generally happens after about a whole sheet or a sheet and a half has been toned, I never strengthen the used-up bath, but prepare fresh baths for the subsequent sheets, 16 ounces each time. This plan is more economical than preparing a large quantity of the solution at once to begin with. I myself like very much the tones which the formulæ produces, but I do not know if such black tones would be suitable for ladies' portraits. It would be advisable, perhaps, in such cases to print less deeply, and thus secure with the formulæ delicate shades of grey. I have sent to the Editor a portrait deeply printed, and one less deeply printed, to see and keep, and he will be able to state whether the tone is a pleasing one or not. These prints were toned by me with the formulæ above given, more than six years back, and the por-

trait taken in an ordinary verandah. This portrait, by the way, reminds me that for P.O.P. retouching must be more carefully done than for albumen paper, which never shows the marks of the pencil so much. A very hard pencil should be used, say a five H, on the unvarnished film, then again on the varnished surface. If that is not sufficient, a transparency must be made by contact, faulty high lights and cross lights in the eyes, &c., removed on it, and a negative made back from the transparency. This negative, if retouched both on the unvarnished and varnished surfaces, will enable one to complete all the retouching that can possibly be required. In the portrait in question a strongly turned-up nose was thus made fairly straight without any difficulty. Most beginners find toning a difficult process, simply because they forget that a wet print looks quite different when dry. They tone until the print assumes the appearance it ought to have when dry, the result being that the prints get much over-toned. A wet print that looks weak and red in the shadows when looked through will look quite bright and black, without a trace of redness when dry and finished. I would recommend every beginner to go to a photographer's and buy a nice black toned, unmounted print. He should then examine it thoroughly by looking first at it, and then through it, and then soak it in water, and see what difference that makes! The lesson will be one which he will never forget.

14. When all the prints have been toned and got into the salt bath, they must be washed in two or three changes and fixed with hypo. My own impression is that P.O.P. prints are seldom fixed as thoroughly as they should be. There is the constant dread lest the gelatine may soften, and thus all the processes of washing, fixing, &c., are hurriedly and imperfectly gone through. If, however, the printing has been done to the depth recommended above, and the prints hardened with chrome alum, there need be no hurry at all, and the fixing could be thoroughly done in two hypo baths, each containing four ounces of hypo in 24 ounces of the solution. I keep the prints moving about in one bath for 15 minutes, then wash them in two changes, and fix them again in the second bath for 15 minutes more. All this fixing is not a bit too much for hardened prints. By this time the prints will look clear and bright when looked through, and a good deal of the image will show through the back of the prints as they lie in the solution.

15. The washing of the prints after fixation can be done in any of the washing troughs sold, but the prints must be washed in a few changes before being placed in running water. Every half hour, though running water has been used, the trough should be completely emptied out, and the water allowed to run again. About three hours of such washing is sufficient, and a final wash may be given by lifting each print out of a dish into another containing clean water three or four times. It is difficult to find troughs large enough to wash large prints satisfactorily, and for such prints it is quite sufficient to keep on lifting the prints from one dish to another of clean water. About 30 such changes would certainly wash the prints thoroughly. Labour is cheap in India, and any little boy can be taught to do this washing. The fact that a properly fixed print is easy to wash need never induce any one to do this final washing in a perfunctory manner. Prints which have been hardened with chrome alum require a much longer wash than those less hardened. If the tap be connected directly with the main, it would be advisable to tie a bag over the tap, to break the force of water, and to prevent iron rust, sand, and foam getting into the washing water.

16. To dry the prints, a sheet or clean towel may be placed on the sloping back of an easy chair, and the prints laid on in rows. Some space should be kept between each row, so that the drippings from the row above could not wet the row below. The spaces absorb the moisture from the prints above. For my own part, I use my reflector, which contains two flaps, both of which can be turned to any position from the vertical to the horizontal. I place a clean unstarched sheet over each flap, and arrange the prints on it in rows. At first, while the backs of the prints are very wet, the flaps are kept in an almost vertical position, so that the water on the surface of the prints could flow down quickly. But as the backs get drier the flaps are fixed more horizontally, and finally quite horizontally, when all fear of the prints, provided the latter have not been trimmed, but clips are in prints, provided the latter have not yet been trimmed, but cups are in any case bad for large prints on P.O.P., because while wet they are very heavy, and the corners by which they were hung break off, and the prints get ruined by falling to the ground and catching dirt on the film side.

17. And now I must explain in detail the process by which the surface is rendered glossy. It cannot but be most annoying and discouraging if

after all the trouble already taken on the prints, the latter should after all stick to the glass! There are many little points which require being attended to very carefully, and I will tell them all as concisely as I can. (a) The more the print is hardened the less will be the chance of the print sticking. In cold climates it will be found quite sufficient to use common alum as directed by the makers. In very hot weather chrome alum must be used as recommended in this article. The more the print is hardened the less will be the resulting gloss, so that if a very high degree of gloss is wanted the prints should never be hardened too much unnecessarily. In cold weather the finest gloss would be attainable, because in such weather it would be quite unnecessary to harden the prints at all with any kind of alum. At the same time I must say that the higher the gloss the sooner does the gloss deteriorate by keeping. The moderate gloss of hardened prints is much more durable, and so in the course of time these hardened prints actually come to look better than the others. So, for my part, I prefer to harden the prints in all cases with common alum in cold weather and chrome alum in very hot weather. (b) The glass plate must be, on one side at least, quite free from scratches and bubbles. A mark must be made with a diamond to show which is the best side of the glass, and henceforth only that side should be used, and never the other side. The plate on the marked side especially must be thoroughly cleaned. It is better not to use the glasses of spoilt negatives for the purpose, because the least trace of gelatine left on the glass would certainly cause sticking. After washing the glass and polishing it with a rough bathing towel, the marked side must be vigorously rubbed with a ball of cotton wool dipped from time to time into French chalk. When the surface acquires a fine ground glass appearance it is ready for use, after the excess of French chalk has been removed with a perfectly dry camel s-hair brush, gently applied. Any excess of chalk left on the glass will stick to the print and spoil its appearance. (c) No accidental splashes of water should be allowed to fall on the prepared plate prior to placing a print upon it. Such splashes remove the talc at those parts, and there the prints may stick. If such splashes have taken place the plate must be wiped dry and chalked again and brushed. (d) If the prints have been hardened, many of them may be placed in a dish of clean water at once, but if not hardened only one print should be put into the water at a time, so that it could not remain in it for any length of time sufficient to soften the film too much. (e) The print should be removed from the dish, dropped face down on to the surface of the water, and before it has time to sink, the print must be seized by two of its corners diagonally, raised up, allowed to drain just for one moment, and not too much, and placed almost dripping wet on the prepared plate. The plate is now held slantingly to allow of the excess of water dripping off. A double fold of clean unstarched Horrock's long cloth (I use my clean pillow cases for the purpose) is next placed carefully on the print, so that not a single crease exists in the cloth, and the cloth rubbed very gently with the hands till it rests quite flat. I then use a rubber squeegee in all directions, at first with a very light hand, and lastly with a free, vigorous movement on the surface of the cloth. The cloth is now removed, and another dry one put on, and the squeegee again applied from the centre outwards in every direction. By this time every bubble has probably been driven off, and it only remains now to dry the print on the glass. (f) This is done by placing the glass with the print attached to it in bright sunshine. The hotter the sunshine the better. The back of the print must, however, always face the sunshine or the source of heat, and never the other side of the glass. It is generally inattention to this rule that causes most of the failures. If the glass side is made to face the heat, the glass gets warm, the gelatine softens, and the prints stick. If, on the other hand, the back of the print faces even the hottest sunshine, the evaporation from its surface cools both the paper support, the gelatine film, and the glass plate, and the print can then never stick. So long as the back of the print or the glass plate feels cold to the hand, the print has still some moisture in it. When the glass gets warm that shows that the print is quite dry and ready to drop off. If hot sunshine be not available, then the heat of a fireplace or a stove could be used at such a distance as to make it equal to the hottest Indian sunshine, but not hotter than that. Of course, the back of the print must in this case also face the source of heat. Merely to keep the plate in a room on a shelf or table and let it slowly dry of itself is never satisfactory when dealing with unhardened prints. For such, the sooner the drying is done the better, and I have often noticed that such prints have stuck owing to clouds having unexpectedly gathered, thus unduly prolonging the drying process. For such prints I always try to select a hot sunshine day as being the most suitable. In dull weather I arrange the glasses around a charcoal stove at such a distance that it feels uncomfortably warm to the face, the backs of the

prints facing the stove. This practice would be the most suitable in England during all except the hottest summer months. (g) As for the time which the prints take to loosen or drop off, I would say that in the burning hot sunshine of India prints which have not been hardened in any way take from 15 to 20 minutes, and they never drop off till quite dry. Prints hardened with common alum take less time, and those hardened with chrome alum adhere to the glass so feebly that they drop off even before they are quite dry. I doubt if these latter could be made to stick to the glass even if we wished them to do so! But if we wish to produce a particularly fine gloss, and have therefore purposely not hardened the prints in any way, then, to avoid their sticking to the glass, all the instructions given above will have to be very carefully followed.

18. If the finished prints be kept between the leaves of a book, each two of them should be placed face to face, so that the gelatine side does not keep in contact with the printed matter.

Broach.

K. B. COOPER, Civil Surgeon.

PHENOMENA OF VISION.

At the last meeting of the Physical Society, Dr. Shelford Bidwell exhibited some "Experiments illustrating Phenomena of Vision." The first phenomenon illustrated was that known as "Recurrent Vision." A vacuum tube, illuminated by an induction coil, was made to rotate about a horizontal axis, and was seen to be followed, at an angle of about forty degrees, by a feebly luminous reproduction of itself. A spot of white light, projected upon a screen and caused to move slowly in a circular path, was also followed by a less luminous spot. The same effect was shown by spots of green and yellow light, but in the case of red light no ghost was visible. The phenomena of recurrent vision are due principally, if not entirely, to the action of violent nerve fibres. The next experiments related to the non-achromatism of the eye. The lenses of the eye do not constitute an achromatic combination, although under ordinary conditions a bright object is not surrounded by fringes of colour. The effects of chromatic aberration are disguised by the luminous haze which surrounds the object, produced by a defect in the eye regarded as an optical instrument. A six-rayed star, formed by cutting a hole in an opaque screen, was illuminated by a gauze-covered condenser containing an incandescent lamp. The star was fairly clearly defined, and there were no fringes. More attentive observation showed a luminous haze. This haze is formed in consequence of the cellular structure of the eye, and the brightest rays—orange, yellow, and green—are chiefly instrumental in forming it. If therefore these rays are obstructed, the conditions are most favourable for the observation of chromatic aberration. The rays were consequently cut off by means of coloured glasses, and the general hue of the star was purple; to some it appeared bordered with dark blue, while to others (long-sighted) it appeared bordered with red.

Two oblong patches, one red and the other blue violet, and of approximately the same intensity, were then produced, side by side, upon a screen. An observer with very good eyesight was able, at a distance of 10 feet, to focus the patches alternately with perfect distinctness. In general, the blue patch was said to be more or less blurred. With an achromatic eye it should be possible to focus both together.

Dr. Bidwell then showed some lantern slides, illustrating the complex form seen when viewing a small luminous spot through a gauze-covered lens placed so as not to be in exact focus.

Some experiments were performed illustrating the principle of the colour top. When a bright image is formed on the retina, after a period of darkness, it has, in general, a red border, which lasts for a fraction of a second. A dark patch, suddenly formed on a bright ground, has a blue border which lasts for a similar time. These effects were attributed by Dr. Bidwell to a sympathetic action of the red nerve fibres. When the various nerve fibres occupying a limited portion of the retina are stimulated by ordinary white or yellow light, the immediately surrounding red nerve fibres are for a short period excited sympathetically, while the violet or blue and green fibres are not so excited, or in a much less degree. Again, when light is suddenly cut off from a patch in a bright field, there occurs a sympathetic insensitive reaction in the red fibres just outside the darkened patch, in virtue of which they cease for a moment to respond to the luminous stimulus; the green and violet fibres, by continuing to respond uninterruptedly, give rise to the sensation of a blue border. By a simple experiment it was shown that the explanation of the colour top, depending upon changes in the convexity of the eye and non-achromatism, was untenable. By the use of a strong light it is possible to get negative after-images, after looking at a brightly-coloured object. These images are complementary in colour to the object, and are formed even if the object is only viewed for a fraction of a second. By means of proper illumination and a disc rotating at the proper speed, a red wafer was so arranged that, upon looking at it,

it was impossible to recognise the wafer itself, but only the continuous green after-image.

The Chairman expressed his interest in the last experiment, in which it was possible to see the negative after-image of an object and not the object itself.

Prof. S. P. Thompson said these experiments threw a doubt on some of the accepted notions about the properties of the eye. Dr. Bidwell asks us to believe that the yellow haze is due to a cellular structure in the eye. Is there such a structure? Can it be observed with a microscope? And do its meshes correspond in magnitude with those necessary to produce the effects? By diminishing the size of the pupil the haze is diminished, and the sharpness of the image is increased. The effects seem to be due to ordinary aberration. Prof. Thompson said that the achromatism of the eye was simply shown by covering half the object-glass of a telescope and viewing a bright object with it. The object then seems bordered with coloured fringes.

Mr. Blakesley, referring to the colour patches used by Dr. Bidwell, pointed out that, although the patches were the same distance from the lens, yet they did not possess the same magnification. The last experiment shown did away with the theory of persistence of vision, because the space between the object and the negative after-image was evidently not illuminated.

Mr. Trotter asked if red and green were the only colours which gave complementary negative after-images.

Dr. Bidwell, in reply, said the effect was obtainable throughout the length of the spectrum.

Studio Gossip.

THE Theatres Committee of the London County Council have sanctioned a plan, submitted by Mr. J. G. Buckle on behalf of the Directors, showing a cinematograph house which it is proposed to erect on the concrete flat outside the back wall of the stage of the Alhambra. The house in question will be built in brickwork, with a corrugated iron roofing.

ZOLA'S New Hobby.—"Pray excuse me," said M. Zola to an interviewer as he crossed the threshold of his comfortable sanctum, "for keeping you waiting. This is the time of day which I usually devote to a new hobby of mine: photography. When you arrived I was developing some snapshots I had taken this afternoon at the Exhibition. Every man should have a hobby, and I confess to a wondrous love of mine. In my opinion, you cannot say you have thoroughly seen anything until you have got a photograph of it, revealing a lot of points which otherwise would be unnoticed, and which in most cases could not be distinguished. Now, pray, take a seat, and let me know what I can do for you."—"The King."

THE Spirit of Modern Science.—"I am afraid," remarked the Countess of Warwick, in a recent address to the Essex Field Club, "that we as a nation have hardly yet risen to that high-water mark of scientific culture which should characterise a great civilisation. I do not mean to imply that we are lacking in scientific ability, that we are devoid of originality, or that we have failed to contribute our share of knowledge to the sum total of human progress. But I fear that the spirit of modern science has not sunk into the public mind—it has not permeated the rank and file to that extent which is required by the age in which we live, the century of science par excellence. Our purses are ever open, and have always been opened, in the names of charity and philanthropy, religious endowment and missionary enterprise, political organisation, and popular sport. But science, upon which the national welfare and our position in the scale of nations ultimately depends, has to go begging for her tens, while thousands are forthcoming for these other objects."

THE Tella Camera and its Uses.—Last week, Mr. W. E. Dunmore, of the Tella Camera Company, Ltd., London, delivered a lecture on the above subject in the Masonic Hall, Whitehaven, under the auspices of the Whitehaven Photographic Society. Mr. Dunmore's discourse to a very large extent covered the wide field of the mysteries of hand camera work, and at the same time illustrated by practical demonstration the possibilities of the Tella camera. Among the many advantages which he claims for it were that it was lighter and smaller than any other camera taking flat films, any number of films up to fifty could be inserted at one time, from one to fifty taken out without disturbing the others, that no special films were necessary, that it could be loaded with the latter number of films in from three to five seconds, that both the lenses gave an unusual crispness and depth of focus, and that it was unusually light when fully loaded and singularly compact. The gathering was apparently very much struck both with the complex construction of the Tella and the ease with which it is worked; and in the second part of the lecture, which was devoted to lantern slides, the applause which greeted most of the reproductions was strongly expressive of the company's approbation. The lecturer possessed not only a very intimate knowledge of the art of photography, but expressed himself in clear and terse terms, mingled with a good deal of humour and dropped many hints gained from practical experience, all of which tended to make the lecture both interesting and profitable.

News and Notes.

THE Exhibition of the Longton and District Photographic Society will open on February 11, 1901, and continue for the following five days.

ROYAL Photographic Society's Ordinary Meeting, Tuesday, November 13, at 66, Russell-square, at 8 p.m.—"Photography in the eclipse of May 28, 1900," by E. Walter Maunder.

ROYAL Institution.—A General Monthly Meeting of the members of the Royal Institution was held on the 5th inst., Sir James Crichton-Browne (Treasurer and Vice-President) in the chair. Mr. W. H. Maw, Mrs. R. Middleton, and Dr. W. H. Perkin, F.R.S., were elected members. The special thanks of the members were returned to Dr. Frank McClean, F.R.S., for his donation of £50 to the Fund for the Promotion of Experimental Research at Low Temperatures, and to Dr. Rudolph Messel for his present of a Bronze Bust of Sir Humphry Davy.

A RIVAL to Acetylene.—According to a newspaper report potato spirit, mixed with pyridene, is fast coming into favour in Germany as an illuminant, and it is said to be most economical in lamps of 70 candle-power and upwards. The report adds that the gardens of the Imperial Palace of Sans-Souci, Potsdam, are lighted with 220 incandescent lamps burning this spirit. If this illuminant be what it is said to be, it should be admirably suited for the lantern in place of acetylene or paraffin, both of which have several disadvantages, as the users of them are aware. Possibly, however, this new light may have corresponding drawbacks. If it has not, there is very little doubt it will soon be introduced here, for there is still room for a good illuminant for lanterns where gas is not available.

MATCHING Colours.—Under the auspices of the Society of Dyers and Colourists, a lecture was given at the Bradford Technical College on "Colour-Matching," by Mr. Arthur Dutton. The authors exhibited a number of patterns dyed to approximately match in daylight, but which showed very great variations when seen by gaslight or the electric arc. By means of a series of absorption spectra they explained how these variations in colour arose, and traced the difficulties of colour matching to the fact that all colouring matters were more or less transparent for red light. Artificial illuminants, gas, incandescent gas, acetylene, the electric arc, all differ in character from daylight, and great inconvenience is experienced by dyers owing to the lack of a reliable light for matching in dark weather. Messrs. Dutton and Gardner have invented a lamp which promises to be of great value to all workers in colour. It consists of an electric arc lamp enclosed in a glass globe of pale blue tint of such character as to bring the light into exact accord with daylight.

THE Rontgen Rays in War.—Dr. J. B. Macintyre, in the course of his presidential address to the members of the Rontgen Society, at 20, Hanover-square, last week, said that the question of the employment of the X rays in war had everywhere naturally created a considerable amount of interest. It was only after the Soudan expedition that anything like a definite idea could be obtained of their utility in the field. It was too recent to say anything about the work in South Africa generally. They were looking forward to a paper from one who had been engaged in the field. He was pleased to report, by the courtesy of Surgeon-General Jameson, the Director-General of the Army Medical Department, that the X rays were found most useful in the hospitals at the base and on the line of communication, although not actually on the field. There was now a regulation list of apparatus for Army work, seventeen sets were sent to South Africa, and they were being adopted in all the larger military hospitals.

THE Royal Society.—The following is a list of those who have been recommended by the President and Council of the Royal Society for election into the Council for the year 1900 at the anniversary meeting on November 30:—President: Sir William Huggins, K.C.B., D.C.L., LL.D. Treasurer: Mr. Alfred Bray Kempe, M.A. Secretaries: Sir Michael Foster, K.C.B., D.C.L., LL.D., Professor Arthur Wm. Rucker, M.A., D.Sc. Foreign Secretary: Dr. Thomas Edward Thorpe, C.B., Sc.D. Other Members of the Council: Professor Henry Edward Armstrong, V.P.C.S., Mr. Charles Vernon Boys, Mr. Horace T. Brown, F.C.S., Mr. William Henry Mahoney Christie, C.B., Professor Edwin Bailey Elliott, M.A., Dr. Hans Friedrich Gadow, Ph.D., Professor Wm. Mitchellson Hicks, M.A., Lord Lister, F.R.C.S., Professor William Carmichael McIntosh, F.L.S., Dr. Ludwig Mond, Ph.D., Professor Arnold William Reinold, M.A., Dr. Robert Henry Scott, Sc.D., Professor Charles Scott, Sherrington, M.D., Mr. J. H. Teall, M.A., Professor J. Emerson Reynolds, Sc.D., and Sir John Wolfe Barry, K.C.B.

MESSRS. Blades, East, and Blades have been good enough to send us a copy of the invitation card to the banquet given by the Corporation of London, at the Armoury House, Finsbury, E.C., to the Officers, N.C.O.'s and Men of the City of London Imperial Volunteers, on their return from South Africa, October 27, 1900. The following is a description of this cleverly designed and well executed production:—A series of pictorial representations of the chief events in the history of the Regiment form the principal feature of the card. At the head of it is a trophy of flags and guns, and the monogram C.I.V. encircled with a crowned laurel wreath. Flanking the trophy on either side are portraits of Field-Marshal Lord Roberts, V.C., and the Right Hon. the Lord Mayor (Sir Alfred James Newton, Bart.), and underneath is the portrait of Colonel W. H. Mackinnon, commander of the regiment. On the right a female figure, emblematical of the City of London, with Guildhall in the background, grasps the hand of a C.I.V., in welcome of the gallant regiment on its return; at her feet are the Arms of the City of London. On the left are views depicting the hoisting of the flag at Pretoria and Bloemfontein, and the march past St. Paul's Cathedral and the Mansion House.

These views are separated from the body of the card by a riband bearing the names of the various engagements in which the regiment has taken part.

Commercial Intelligence.

MESSRS. E. Krauss and Co. (of Paris), whose agents are Messrs. A. E. Staley and Co., of 35, Aldermanbury, E.C., are now supplying Kodak cameras fitted with Krauss-Zeiss Anastigmats.

MESSRS. Newton and Co., of 3, Fleet-street, E.C., have issued a supplementary list of lantern slides for the season 1900-1901. Amongst many others there are series dealing with the Transvaal and the War; the War in China; Hoffmann's Life of Christ; the Paris Exhibition; and many others.

MR. Charles H. Atkinson, of 66, Victoria-street, Liverpool, writes that the partnership heretofore subsisting between him and Mr. Frederick Atkinson, carrying on business as Photographic Dealers as Atkinson Brothers at the above address, has been dissolved. The business will in future be carried out by Mr. Charles Harold Atkinson alone.

A NEW Firm.—MESSRS. H. Armitage Sanders and H. A. Crowhurst inform us that they have opened premises at 71, Shaftesbury-avenue, London, for the sale of optical instruments and apparatus of every description. Mr. H. A. Sanders was with Messrs. W. Watson and Sons, of High Holborn, for nearly twenty years. The production of projection apparatus will be his special care, also the publishing and colouring of lantern slides. Messrs. Sanders and Crowhurst have been appointed sole West-End agents for the sale of Messrs. Watson's instruments. We wish the new firm success.

CINEMATOGRAPH Films of the C.I.V. Procession.—MESSRS. W. Butcher and Son, of Blackheath, inform us that the following films were taken from the roof of the Gloucester Gate Lodge, Hyde Park; they show the procession coming from the Marble Arch:—No. 1, showing Mounted Police, Band of the Honourable Artillery Company, Hussars, Colonel McKinnon, Major-General Trotter, and other Officers and C.I.V.'s, 63 ft.; No. 2, showing Battery of the C.I.V., Band of London Rifle Brigade, C.I.V.'s, and Band of the London Scottish Rifles, 71 ft.; No. 3, C.I.V.'s, with flag captured from the Orange Free State, 31 ft.; No. 4, Infantry Battalion of the C.I.V. (remainder), Machine Gun Section of the C.I.V., Ambulance Wagons with invalids and detachment of Guards, 68 ft.

MESSRS. Walker and Company, Cinematographers, of 19, Bridge-street, Aberdeen, write:—"In the matter of high-class cinematograph entertainments, we may mention that our programme is always carefully built up, the one item leading to the other, making every programme a valuable education. We judiciously enter into fun where it can be introduced. We also introduce all the natural effects. Then, where explanatory matter is required, full information is given from the platform. We raise our audiences like the waves of the sea, at times at loud applause, the next second you can almost hear the watches ticking. If everyone connected with this form of entertainment would take a personal interest in the subject, it would at once place it on a higher platform, instead of relegating it to the last turn in the music-hall programme."

THE Lac Industry of Assam.—A recent report of the Assistant-Director of Agriculture in Assam, says "The Times," deals in detail with the lac industry there. Lac occurs in its natural state in various parts of the forests of Assam, as well as of Burma, but chiefly in parts of the Khasi and Garo Hills, and the export in recent years has averaged 16,000 maunds, or something over 500 tons, but in some of the forests, owing to the ravages of the Kolaazar epidemic and depopulation, the production is declining. The production of Manipur is not sufficient for the local needs, and quantities of the lac are sent away from Assam in the crude form, or stick lac; shell and button lac are made, to some extent, but lac dye is not now prepared anywhere in Assam, and lacquer wares are only produced in two places, so that this once considerable industry would seem to be dying out. The black lacquer of Manipur is really not a lac preparation at all, but only the juice of a tree sent from the Kubo Valley. In Assam the lac is usually collected twice a year, first in May and June, and then in October and November. The first is mainly used for seed purposes, while the second forms the export. A few days after the collection, pieces of stick lac containing living insects are tied on to the branches of the trees on which the next crop is to be grown. The usual plan is to place the lac in small bamboo baskets and tie these on the twigs of the trees. The insects soon crawl out, and spread over the young branches, on which they promptly begin to feed, and secrete the resin. This is allowed to go on for about six months, when the lac is collected; but, if the secretion has been defective or insufficient, the insects remain undisturbed for another six months.

MANUAL Training in Germany.—On October 1 last, twenty-four years had elapsed since the movement having for its object the manual training of boys was inaugurated in Germany. In this space of time the idea has certainly been disseminated largely in the country, and over two thousand teachers have given their co-operation to the movement; nevertheless, says the United States Consul at Glauchau, both the internal and external conditions connected with this new branch of tuition leave much to be desired. The original training in home industries and home-occupation has almost entirely disappeared; it is carried on at present only in a few places in Holstein and in 17 institutes for the blind. Most of the other educational establishments in Germany, including 18 orphanages and 46 deaf and dumb institutes, have already introduced manual training into their curriculum. The endeavour, however, to pre-

pare the pupils in the schools directly for the eventual handicraft has obtained importance in only two of Germany's institutions of learning. The majority of the German home-industry schools only deal pedagogically with the subject. There exist at present in Germany, distributed in 605 places, 861 schools and institutes wherein manual training is carried on in 1,514 workshops. Of this number 836 schools and institutes conduct the training on a pedagogical basis. Prussia has 570 manual-training schools spread over 435 places and distributed among 596 workshops. Industrial centres take the lead as follows:—Prussia, Upper Silesia, the Rhenish province, and the kingdom of Saxony. The 1514 pupils' workshops comprise 286 independent manual training schools, and 238 public schools, of which 16 are auxiliary schools, where the work is obligatory; 17 middle-class schools, 41 high schools—made up of 8 gymnasiums, 12 technical and technical high schools, and 15 boarding schools—7 preparatory institutes, 26 teachers' seminaries, and 93 boys' asylums, while the remainder is made up of various kinds of private educational establishments. The organisation of the handicraft tuition in the individual schools and institutes is varied in character. Sixty-nine institutes have adopted the whole curriculum as recommended by the German Association for the dissemination of Manual Skill, while 16 dispense with the preparatory work; of the rest, 177 schools and institutes confine themselves to three branches, 261 limit themselves to two, and the remainder to one branch only. Five hundred and thirty-five workshops are devoted to wood-carving, 527 to working in cardboard, and 336 to the carpenter's bench; of these, 68 are closely connected with wood-carving, 77 with preparatory roughing out work, 35 with metal work, 11 with turnery, and 11 with modelling in clay. Pedagogical manual tuition has branched out in three directions; the practical formal method, which regards handicrafts as a means to general culture; the direction advocated by those who aim at the so-called school manual dexterity; and the system which would make the manual training serve as the basis of individual branches of teaching, and utilise these in order to influence the method of instruction in schools. The first two are becoming more and more amalgamated. In the third direction, Professor Kumpa, at Darmstadt, School-Inspector Scherer, at Worms, and Herr Bruckmann, at Königsberg, are at present engaged in making thorough experiments in public schools. The participation of German teachers in the efforts of the German Association is steadily increasing. Over 2,200 German teachers have up to now been taught to become instructors in manual training. Of these, 950 were taught in Leipzig, and 1,250 acquired training in 33 places in other parts of Germany.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
13-17	Aintree	Seventh Annual Exhibition.
13.....	Birmingham Photo. Society	<i>Light and Shade.</i> C. T. Cox.
13.....	Royal Photographic Society	{ Photography in the Solar Eclipse of May 28, 1900. E. Walter Maunder. Lantern-slide Making. Benjamin E. Edwards.
13.....	Thornton Heath	Bromide Enlarging. John H. Gear, F.R.P.S.
14.....	Borough Polytechnic	{ Fifty-first Public Lantern Show.—Snap-shots on the Spanish Seaboard. R. Child Bayley.
14.....	Croydon Camera Club	Demonstration: Ozotype, the New Carbon Printing Process without Actinometer Transfer or Safe Edge. Thomas Manly.
14.....	Photographic Club	Lantern-slide Making. J. A. Hodges, F.R.P.S.
14.....	Redhill and District	The Dales and Coast of Yorkshire. Godfrey Bingley.
14.....	Scarborough	Stereoscopic Photography and Projection. W. H. Tomkins.
14.....	Sefton Park	Narrow and Wide-angle Lenses and Subjects. W. E. Debenham.
15.....	Hull	Three Continents in Six Weeks. George E. Thompson.
15.....	Liverpool Amateur	Open Night.
15.....	London and Provincial	Monthly Competition.
16.....	Bognor	Instruction Evening: Defects in Negatives: Prevention and Remedy.
16.....	Borough Polytechnic	Lantern Slides: Royal Meath and County Wicklow.—A Day and Night in Newspaper Land.
16.....	Croydon Microscopical	On the Optics of Trichromatic Photography. F. E. Ives.
16.....	Royal Photographic Society	

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 6.—Lantern Evening.—Mr. J. J. Vezey in the chair.

CITIES AND SIGHTS OF SPAIN.

Mrs. Aubrey Le Blond inaugurated the Lantern Meetings of the Session 1900-1 with an exhibition of slides illustrating her lecture on "Cities and Sights of Spain." Mrs. Le Blond, who is better known to photographers as Mrs. Main, has made several tours in Spain, on the first occasion being alone, and has collected a very comprehensive and most interesting series of photographs of many parts of the country which, although easily accessible and well provided with hotel accommodation, are seldom visited by British tourists. She emphasised the fact that she had been allowed to take photographs practically everywhere, the only necessary preli-

minary being a polite application to the custodians of cathedrals, churches, palaces, and other buildings, for permission to do so. Permission had always been readily granted, the officials having been most anxious to render assistance, and this with no view to a subsequent pecuniary consideration. Travelling was easy and cheap, the first class fare for an extended railway tour of some 3500 miles, with facilities for breaking the journey at any point, being about £13. The beautiful photographs shown related principally to the architecture of Spain, beginning with the prehistoric buildings and proceeding through the Roman and Romanesque to the Late Gothic and Moorish, the final series consisting of typical scenery, street scenes, and curiosities of the country and the people. The localities illustrated included Barcelona, Tarragona, Segovia, Martorell, Merida, Cordova, Gerona, Leon, Tudela, Burgos, Toledo, Manresa, Avila, Seville, Montserrat, Salamanca, and many others, the slides being very charmingly and eloquently described. The lecture and exhibition were much appreciated by an overflowing audience, and a most successful start was given to the new series of lantern meetings.

COMING EVENTS.

November 13, Ordinary Meeting, "Photography in the Solar Eclipse of 1900," by Mr. E. W. Maunder; November 16, the Traill Taylor Memorial Lecture, "The Optics of Trichromatic Photography," by Mr. F. E. Ives; November 27, Technical Meeting, "Analytical Portraiture," by Mr. Francis Galton.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 1.—Mr. J. E. Hodd in the chair.

The Chairman passed round a bromide enlargement that had been toned in copper, as per Fergusson's method, some eight months ago, and which now showed a metallic iridescence over the entire surface of the picture.

Mr. Haddon put this down to insufficient washing.

Mr. Beckett suggested that this iridescence might be got rid of by rubbing over with waxing solution.

The Chairman also showed a new exposure meter and a granitine plate for use in the development of rollable films in the length. The meter is by Mr. Watkins, and intended for interior photography with Kodak cameras, the tint being such as to show a correct exposure on Kodak film at f-16. The granitine plate is an arrangement with supports on either side, so as to leave a small space underneath, the ends being rounded off. This is stood in the developing tray, and the film (film side down) passed underneath backwards and forwards, the granitine plate thus keeping a certain length of film always in the developer.

Mr. E. Human then gave a demonstration on the intensification of carbon prints and transparencies by means of a number of aniline dyes. In the course of the development of the carbon pictures, he made reference to a brush he usually employed, which was composed of a wedge of indiarubber covered with felt.

Mr. Haddon thought that this brush, as described by Mr. Human, would be very detrimental to a carbon image, which, as a rule, required such gentle handling, and suggested the use of velvet or plush instead.

Mr. Drage said he was of the opinion that velvet or plush would answer, as it would get so hard.

Mr. Beckett remarked on the difficulty of keeping the high lights completely clear, as in all cases a slight film of gelatine remains, and it is impossible to remove it.

PHOTOGRAPHIC CLUB.

OCTOBER 31.—Mr. John Nesbit in the chair.

Mr. W. L. H. Skeen showed an excellent series of slides illustrative of the manner and customs of the Cingalese and of Ceylon landscapes. Those of the natives were of particular interest, as showing the differences between the two or three races that inhabit the island. Some of them were taken at considerable trouble, far in the interior of the island, to preserve a record of a scanty and disappearing tribe still living in the forests, and others gave an excellent idea of the dresses affected in various parts of the island.

Mr. H. Snowden Ward described, as they appeared on the screen, some slides of places connected with Dickens and his famous characters. All parts of the country possessing associations with the author were visited, such as Exeter, Portsmouth, and Rochester, and London, of course, contributed very largely to the series.

Mr. Hans Muller showed some pictures taken on the Rhine and Moselle, while others of a miscellaneous character were also projected on the screen.

FORTHCOMING EXHIBITIONS.

1900.

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| November 9, 10 | Cripplegate Photographic Society and the Essex and Middlesex Cycling Union, Ltd. Hon. Secretaries, A. T. Ward, Cripplegate Institute, E.C., and G. F. Sharp, Sach-road, Upper Clapton, N.E. |
| " 12-17 | Ashton-under-Lyne. |
| " 19-24 | Waterloo and Blundellsands Photographic Society Hon. Secretary, W. G. Eyre, 2, Mersey-road Blundellsands. |
| 21-23 | Hackney Photographic Society. Hon. Secretary, W. Selfe, 70, Paragon-road, Hackney, N.E. |

- November 21-24 Cleveland Camera Club. Hon. Secretary, F. W. Pearson, 98, Victoria-road, Middlesborough.
 .. 22-24 Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.
 1901.
 January 14-19 Blairgowrie and District Photographic Association. The Hon. Secretaries, Blairgowrie, N.B.
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Patent News.

THE following applications for Patents were made between October 22 and October 27, 1900:-

ROCKER.—No. 18,824. "A New or Improved Apparatus for giving a Rocking Motion to Dishes and the like used for Photographic Purposes and the like." H. J. CLEVERLY.

FOCUSING.—No. 19,033. "An Improved Arrangement for Focusing in connexion with Photographic Cameras." M. BRETT.

PRINTING.—No. 19,059. "Improvements in or in connexion with Photographic Printing Processes." S. G. FRY.

FILM CARTRIDGES.—No. 19,108. "Improvements in or relating to Photographic Film Cartridges and the like." Communicated by M. J. Ehlman. KODAK, LIMITED.

SHUTTERS.—No. 19,172. "Improvements in or relating to Photographic Shutters." J. H. P. WALKER.

IMPROVED PROCESS.—No. 19,284. "An Improved Process of Photography." S. J. F. MARCHAND and B. C. LE MOUSSU.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

THE EXHIBITION OF AMERICAN PHOTOGRAPHY AT RUSSELL SQUARE.

To the Editors.

GENTLEMEN.—As an onlooker, it appears to me that Mr. Holland Day would have been far better advised had he undertaken the task of replying to his critics, instead of relegating the job to an admirer such as Mr. Evans, or that other gifted American, who, in the last issue of a contemporary, under the thin disguise of a criticism of British photography, devotes two-thirds of his article to railing at all and sundry who fail to appreciate all the work at Russell-square.

The author of this article, however, we can forgive, for most men, I take it, who have seen his work at Russell-square will not fail to recognise in him the making of a first-class humourist. Dealing collectively with this brilliant and intellectual coterie, the American school, and their friends in this country, it seems to me that the position they take up is somewhat as follows:—Admire these pictures, and recognise Mr. Holland Day as "The Master." Fail to do this, and we brand you as rude and ignorant. Why should this be so? The only reason I can suggest is, though possibly I may be wrong, that the leaders of this school are afflicted with the most colossal brand of vanity. This opinion is borne in upon me, in view of the fact that Mr. Holland Day is stated to have said in the course of an address made by him before the members of the Royal Photographic Society at Russell-square, "That there was as much art in applying chemicals to a print to bring out a particular tone, as there was in the work of the artist who applies colours to his canvas through the medium of a brush"!!! Mr. Evans, in his letter of this week, takes the trouble to assure us that Mr. Day is an artist and a gentleman, a totally superfluous statement. Mr. Day's personality does not interest me one little bit. I am only concerned about his pictures, and I take it that this is the attitude of most men interested in the subject. In conclusion, may I add that I should have far greater respect for Mr. Day if he replied to his critics, instead of leaving the matter in the hands of his admirers, who, in their enthusiasm for the man, lay themselves open to the charge of writing a great deal of "piffle."—I am, yours, &c.,

TACOMA.

To the Editors.

GENTLEMEN.—In reply to Mr. Evans' letter in your last issue, may I be allowed to point out that, although I, in common with thousands of other people, do not hold your views on the Passion Play, yet I quite agree that there is something distinctly objectionable in the photographic representations of it, and also in Mr. Holland Day's pictures.

Now, why is it? Is it true that "the lens and dry plate do not idealise as the painter or draughtsman can or may"? The subject has inspired some of the greatest painters; their masterpieces have been painted from living models made-up to be portrayed as the Christian Redeemer! Is Photography so far removed from Art? Is the camera so far beneath the painter's brush that an artist must needs lay aside all hope of using it as a means of evoking "a reverent and mental conception of a suffering Christ"?

I think not! The fault, I feel sure, lies with the artist's method, rather than with his tools. If Sir Joshua Reynolds had attempted to paint a "Descent from the Cross," he would have utterly failed, and, on looking at his work, however technically perfect, we should have felt that we were looking at the dressed-up image of a human man. But yet Rembrandt's masterpiece strikes the most sceptic heart with awe.

The two methods are admirably illustrated in the Wallace collection. Look at Sir Joshua Reynolds' finest portraits, and then on the wall opposite turn to Rembrandt's "Unmerciful Servant." The former has faithfully laid to canvas the minutest details of his fair sitter's features and dress. Nothing that long, patient, and attentive study of his model could detect has been omitted; yet the picture, however true to Nature, lacks life. In Rembrandt's work, on the contrary, detail is made subservient to light and shade; the whole interest centres on the expressions of the principal subjects; there is no superfluous detail to distract the attention, but just sufficient has been brought out to give life and vigour to the whole composition.

This is no plea for the new school of photography. No one more thoroughly despises the faked, fogged, and smudged platitudes exhibited by the vast majority of would-be creators of a new American school than I do; but also no one more cordially detests the sharp, shallow-focussed, over-retouched, and badly-lighted productions shown by some of our leading London photographers.

Will our self-styled artists never realise that if any measure of success, however small, is to attend their efforts, they have much to unlearn? Will they never realise that a technical knowledge of photography, however perfect, will not enable them to produce one single piece of artistic work if they have no artistic talent, and have not developed it by careful study of the old masters? That an artist, however bountifully endowed with Nature's rarest gift, can never do himself justice with the camera if he does not possess a thorough theoretical and practical knowledge of photography and dark-room chemistry? But to the artist who is also an expert photographer the camera is, I believe, the potentiality of producing works of Art beyond the possibility of the draughtsman's pencil, equal perhaps to the painter's brush!

I am, yours, &c.,

TUCK.

To the Editors.

GENTLEMEN.—I am one of those who cannot understand the *raison d'être* of the photographs from living models of subjects which many people hold sacred. The prosaic realism of photography surely cannot be compared to the idealising genius of a great painter, no matter how much "personal control" the photographer may exercise. When people purchase photographs of those who take part in the Passion Play at Ober-Ammergau, they surely purchase nothing more than the photographs of actors. And Mr. Holland Day is an actor, for the time being, posing as model to represent Christ. Just because Mr. Day is alleged to bear some resemblance to the general conceptions of Christ, is this any reason why he should photograph himself as such? What is the object in view? What purpose is served? Mr. Day's photographs are only photographs of himself; what else can they be?—I am, yours, &c.,

Cutcliffe-grove, Bedford, November 2, 1900.

J. A. REID.

To the Editors.

GENTLEMEN.—As the subject of photography in relation to sacred subjects has been again raised by the Exhibition now being held at the house of the R.P.S. in Russell-square, I shall be glad if you will allow me to make a few remarks supplementing what I said on the opening evening of that Exhibition.

I regret to find that I differ very materially from the views of my friend, Mr. F. H. Evans, who wrote so eloquently in your last issue in defence of Mr. Holland Day.

I think it will help us to a right conclusion if we keep in mind the

act that the essential feature of all photography is realism. A photograph cannot be good unless it accurately represents the original from which it was taken. Now, as there are no originals left of sacred subjects, it seems to me there is no field for photography in this direction. You may dress up and pose as a model to represent a particular person, but when you have photographed it you have only a portrait of that model in costume.

The question has been asked: "Why are painters allowed to treat sacred subjects if photographs may not do so also?" To this I reply, that a good painter always tries to idealise his subject, if it be a sacred one, and even if he employs a model it is only to suggest ideas, and in no case does he attempt to paint a simple portrait of his model. In looking at a photograph you cannot forget that it is a representation of something which existed when it was taken.

As to the question of good taste in reference to such a photograph as Mr. Day's "Seven Last Words," can any one have the presumption to suppose that he can, in his own countenance, express faithfully the overwhelming suffering and sorrow the Saviour of the world endured in His last moments? Where, then, can be the pleasure or profit in looking at a feeble attempt to portray this? Is such a moment one which, under any conditions, you would wish to perpetuate by photography? If you were standing by the bedside of a dear friend dying in excruciating agony, would you consider this a fitting moment to take his photograph? There can be but one answer, emphatically "No." Consider, then, the pain you must inflict on many pious people in placing before them such an attempt at reproducing so sacred a subject.

As to the Ober-Ammergau pictures, those I have seen simply represent the actors in their various costumes. I have seen none in attitudes of intense suffering; but, if there are such, I should certainly object to them, as I do to Mr. Day's pictures.

I have said on a previous occasion that I do not charge Mr. Day with being wilfully irreverent, but I certainly do think he has not given the subject sufficient consideration, or he would not meddle with such sacred matters.

No one who heard his address at the opening of the American Exhibition can doubt his sincerity or his enthusiasm, but I do hope he will confine his attention to mundane subjects, which will furnish him with ample scope for his talents.—I am, yours, &c.,

J. J. VEZET.

188, Lewisham High-road, Brockley, S.E., November 5, 1900.

To the Editors.

GENTLEMEN,—Have you noticed what a writer in a contemporary says in commenting upon your criticism of the "American School of Photography"? It is this: "Ah! . . . if the tenth part of your professional readers could only do half as well, how vast would be the uplifting of English studio portraiture!" Ye gods and little fishes! what an insult to your readers, and, indeed, all professionals. I can only put such an exclamation down to the writer's ignorance of the profession, and must leave it for more abler pens than mine to deal with him, as he so richly deserves. I am a poor struggling professional living in the provinces, and had not a family affair taken me to London I should never have seen the "Exposition Hollandaise," which is now contaminating the beautiful rooms of the Royal Photographic Society. I, of course, had read certain eulogistic accounts of it. It is all very well for scribblers about art, soul, feeling, &c., to sit in their easy chairs, with a bath bun and a glass of milk beside them, and go into ecstasy over such work; but let them come out into the world and try a little "bread and butter" work, and I am thinking they would sink back to their lairs with a new mind loaded up with good intentions to elevate the poor professional, instead of endeavouring to drag him down to his ruin. What other remark do I see in the same issue? It is this: ". . . that horrible style, the P.O.P. print on a gold bevelled edged olive enamel mount in a mora gilt bevelled glass stand!" I wonder if the writer of that knows of any one who has made lots of money out of "the horrible gold bevelled edged olive enamel mount?" I have an idea that I do. Ah, me! what a good weathercock some folks would make.—I am, yours &c.,

A PROVINCIAL PROFESSIONAL.

THE CITY AND GUILDS EXAMINATION.

To the Editors.

GENTLEMEN,—You give in last week's BRITISH JOURNAL OF PHOTOGRAPHY the report of the examiners in photography for the City and Guilds of London Institute.

This report, similar to several previously given, is mainly to the effect that the elements of photographic chemistry and optics do not receive sufficient attention.

As practically the whole of the professional students who sit at this examination come from here, I shall be grateful if you will allow me to say a few words on behalf of these students, and ourselves as teachers.

The City Guilds give two certificates, one for photography pure and simple, and the other a full technological certificate, to those students, only, who have studied chemistry and optics, or drawing, and yet, notwithstanding this special certificate for accessory subjects, we get an undue proportion of scientific questions, and a continual complaint of insufficient knowledge of science in an examination, which is represented to be for pure photography.

Any one with a little knowledge of chemistry and optics, by spending a few hours in reading an elementary text book on photography, and with the merest smattering of practical knowledge, can go up to the examination and get a pass, or very likely gain medals—that is to say, come out at the top, whilst earnest and sensitive students, who are brimful of more useful knowledge, and of immeasurable superiority as photographers, do not even get a second-class pass. On what grounds can such results be justified.

No one can know better than we teachers that the great majority of professional photographers lack knowledge in chemistry and optics, but the point is this, consciously and unconsciously, the City Guilds give great prominence to, and unduly encourage, these subjects, and a feeling is produced among educational authorities, the public, and students (the latter too young to judge for themselves) that these, and these only, or mainly, are the subjects which determine a young photographer's proficiency and progress. At the present moment this school is full to its maximum accommodation with professional students, and we have reluctantly been compelled to refuse many entries. May I ask, under these circumstances, what is the duty of a teacher, who feels more painfully every day, the misdirection of youthful energies which this excessive forcing of elementary science involves, shall he also by continually lecturing upon these subjects, encourage the less fit and discourage the more fit.

There is an old saying that one example is worth many sermons: look down the names of a few of those who are eminent in photographic chemistry or optics, and tell me where is the evidence of their superiority, as photographers; on the other hand, also make a list of those you consider eminent as photographers. The chances are that very few, in this latter list, could pass the elementary grade of the City Guilds examination. Do not let it be supposed from these remarks that I wish to discourage the study of chemistry or optics—for plate makers, camera makers, lens makers, some teachers, and many others, they are fundamental; to photographers, they are useful auxiliaries, but not essential, and should, if possible, be studied as subjects separate from photography, for in the majority of cases, as surely as undue attention is given to what may be termed the science of the subject, so surely will the students go backwards, instead of forwards, in their progress as photographers. And if public diplomas or certificates are given, and labelled, as for photographic knowledge, surely the injustice of branding those students as failures who have the fullest essential knowledge, but not the scientific faculty, can be avoided?

In conclusion, I wish to say that during the years this school has been open, we have received everything that could be wished for in the points of courtesy and kindness from the City Guilds, and if they could only be persuaded to take an active interest in the examination, by bringing their official representatives in actual contact, and association, with photographers and students, they would be the first to admit that very radical modifications in the examination are required.—I am, yours, &c.

HOWARD FARMER.

The Polytechnic, 309, Regent-street, W.

A SOCIETY FOR SOUTHEND.

To the Editors.

GENTLEMEN,—Yesterday evening, a new Photographic Society was inaugurated, to be called "Southend-on-Sea Photographic Society." Mr. Bullivant, Principal of the Ascham College, Westcliff, kindly placed a room at the disposal of the members until more suitable accommodation can be found. The rules are practically the same as those of the Photo Club, and the meetings every alternate Wednesday, at 8.15. As there was no organisation of the kind in this district, it should be a success. I thought you wild like to know any photographic movement of this kind.—I am, yours, &c.,

EDWARD DUNMORE.

Westcliff-on-Sea, November 2, 1900.

PHOTOGRAPHS REGISTERED:—

A. J. Ashbolt, 29, High-street, Southampton.—Photograph of A. Lee.

S. Powell, The Studio, High-street, Rushden, R.S.O.—Photograph of Miss Willoughby.

A. W. Sargent, 12, Albany-road, Cardiff.—Photograph of family group, including five generations.

B. Graham, Esplanade, Whitley Bay, Northumberland.—Photograph of Cullercoats Railway Station, flooded.

Barker & Price, 117A, High-street, Croydon.—Photograph of school group, North Park College, Croydon, and photograph of gymnastic class.

Answers to Correspondents.

* * * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

F. DRADER.—We have no experience of the plates. A letter addressed to Mr. G. F. Wynne will, no doubt, elicit the information.

CHRISTMAS MOUNTS.—C. H. E. These may be had in great variety from any of the large houses, such as Marion's, Houghton's, Fallowsfield's, and others. Consult the advertisement columns, and write for samples, enclosing your business card.

H. GRAHAM GLEN.—The names of the actual makers we do not know, but plush goods are obtainable from such firms as Marion and Co., Houghton and Son, and others.

H. RAYMOND.—It is against our rules to give such recommendations. Can you not have the camera sent to you on approval, and satisfy yourself? You are the best judge of your own requirements.

CELLULOID TABLETS.—CELLULOID writes: "Can you give me the address of a firm that supply celluloid tablets suitable for putting carbon pictures on?"—In reply: Probably Messrs. S. Guitermann and Co., of 35, Aldermanbury, E.C., could supply you.

FELLOWSHIP OF THE R.P.S.—INQUIRER writes: "I should be greatly obliged if you would inform me how one may become a F.R.P.S.?"—In reply: Address the Secretary of the Society, 66, Russell-square, London. We have many times given the particulars asked for, but cannot now spare the necessary space.

FOCUS.—(1) A R.R. lens of good quality, of $9\frac{1}{2}$ in. focus, will cover a half-plate very well. (2) Not at all, you would have better covering power with the 10 in. (3) Either before or behind the lens, whichever is most conveniently fitted to the camera. One position is as good as the other.

S. WATTEAU.—Better do as we told you last week. Use the developer according to the formula given by the makers of the plates. If the plate proves under-exposed, use more accelerator. If over, employ more restrainer. As you appear to be quite a novice in photography, we should advise you, as you are going in for portraiture, to get a few practical lessons from a professional. It will save you trouble.

CLUB PORTRAITS.—J. H. MOODY writes: "I would feel obliged if you could give me the names of a firm of painters for club work?"—In reply: It is one of our inflexible rules never to recommend any particular firm's work, and that we never depart from. Better consult the advertisement columns, and there you will find several names who lay themselves out for that class of work. Write to them for specimens and prices.

DRY MOUNTING.—"Stickey" writes: "Can you inform me how I can make the backs of photographs adhesive, so that by simply wetting them they will stick to cards? I want them to dry quick—not longer than 5 or 10 minutes?"—In reply: The best way is to coat the back of the prints with starch paste, and allow it to dry. Then in mounting them simply slightly damp the mounts with a moist sponge, and after placing the prints in position pass through the rolling press.

EDGBASTON.—It is against our rules to recommend particular makes of apparatus. We have successfully used Nos. 1 and 3 in your list, and have many excellent pictures by No. 2. You must make your own choice, for the personal equation in photography counts for much. As to plates versus films for "yielding the best negatives," our personal choice is for plates, of which we have used some thousands; on the other hand, we have negatives on cut and rollable film than which we could wish for nothing better. The advantage of keeping quality lies with the plates; that of lightness with the film.

BLISTERED OPAL.—"Othello" writes: "A customer has brought me a picture to be restored. It is an oil painting on an opal base, presumably bromide opal, as it is a club picture. Around the edges of the vignetted bust the gelatine film of the opal seems to have blistered up very similar to paint that is exposed to the sun. As I never saw a similar case, I should be glad if you could tell me how to reduce the blisters, as I don't want to tamper with the thing if I cannot do the work properly? I notice no blisters occur where paint has been spread, only on the bare portions."—In reply: In all probability the picture is a bromide, and the film has blistered. We know of no means of reducing the blisters. It is possible, however, that the film may be removed from the whole of bare portions by washing it off, or by rubbing it off with fine pumice powder. Then the picture on those portions can be re-coloured.

CHRISTMAS CARDS.—H. W. Surely you do not read the advertisement columns of the JOURNAL, or you would not have to inquire of us where you can get mounts suitable for Christmas cards. Refer to the advertisement pages.

ACTION OF METHYLATED SPIRITS ON ALBUMEN PRINTS.—A. F. P. writes: "I am using albumenised paper again to some extent, after having discarded it for some years. I have been much troubled with 'blisters,' but find a bath of methylated spirit before first washing a perfect cure. Will you kindly say if any possible injury can result from its use, either to the permanency or appearance of the finished print? Will it affect the toning bath, which in the ordinary way improves by use?"—In reply: The spirit will have no injurious effect whatever either on the prints or the toning bath. So you may employ it without fear.

PYRO STAINS.—S. F. writes: "I use pyro soda, made up as follows: pyro 1 oz., a few drops of nitric acid, water 8 ozs., equal quantities of sulphite and carbonate soda. After development my hands get fearfully stained, and even with hydrochloric acid I cannot get it off. Can you give me a formula which will remedy it? I have tried adding half the sulphite to the pyro, but I cannot get density then."—In reply: Pyro stains, when they are strong, are difficult of removal. You might try a strong solution of chloride of lime. It is easier to avoid the stains, by using care, than sometimes to remove them. There are several developers that do not stain the fingers, such as kachin, and several others. Why not employ one or other of them if you cannot avoid stains with pyro?

A CRITICISM.—REMBRANDT writes: "I am taking the liberty of sending you a print from a negative of my own taking, and wish to ask you to criticise it, also, if you think it is of any value to enlarge and prepare for an exhibition picture, or if you could suggest any way in which it might be utilised with a view to exhibition? I may say it is not a studio picture, but was taken outdoors without any arrangement to produce the lighting. Of course, it has been retouched, and the high lights just slightly strengthened with colour, no other work, however, has been put upon it."—In reply: A pleasing and pretty child study. If enlarged it might find acceptance at one of the minor Exhibitions. One of the illustrated magazines might purchase it from you for reproduction purposes. Better register the copyright before you submit it for sale.

PORTRAUTURE.—"Aspirant" writes: "I have been practising photography—portraits—at home in all my spare time for the last four months, and can produce excellent pictures, as you will see by the enclosed. Do you think I could get an appointment in a good class studio as operator? I do not require to go as an improver, as I consider my work good. I should not mind accepting 35s. to £2 a week to begin with."—In reply: We should say not. The work sent, though promising, would certainly not suit a good class house—or we may say a second class one. We should advise you to seek an engagement as improver, for we may tell you, without wishing to discourage you, that the work requires much improvement. There are plenty of experienced operators who can do far, very far, better work than that sent, who would be glad of employment for a much less sum than you mention.

CAMERA OBSCURA.—C. F. HEWITT writes: "I am thinking of erecting a camera obscura here for next season. Can you kindly give me the name and address of the makers of the revolving arrangement for top? I want to have a picture on table of about 5 feet diameter. Will you also kindly tell me about the best lens to use, as I have several surplus lenses, and perhaps one of them might do? I have an old $3\frac{1}{2}$ in. diameter, by Lerebours et Secretan, Paris. Would that do? It would be for public exhibition on the beach, so, of course, should want the best."—In reply: The lens mentioned will answer very well, if it is of sufficiently long focus to give an image of the size desired, though we are inclined to doubt if it will. That you can prove by trying it. Some of the lenses of the makers referred to were, however, of very long focus for their diameter. We do not know of any one who makes a speciality of the revolving top; but, of course, any optician will construct it to order.

MARKS IN PLATINUM PRINTS.—F. M. writes: "I should be much obliged if you could inform me as to the cause of the markings (dark spots without sharp edges) on the enclosed print? It is a platinotype print on A.A. paper, developed cold, and made from a varnished negative. The spots appear persistently, though I have made several fresh batches of developer, and the dishes are not used for anything else. On some hot bath paper, which I tried, and which was treated in identically the same manner, and with the same developer heated, the spots did not appear. I have been told that it is due to a defect in the sizing of the paper, which seems probable, as you will see that the spots do not appear in the whites of the print, as they would if they were due to defects in the solutions or manipulation. The developer has been analysed, and no impurities found. Needless to say, the company will not accept any liability, but content themselves with bluff. I feel that I ought to apologise for troubling you at such length, but it is a somewhat important matter to me, as my employer blames me for what I feel sure is not my fault."—In reply: We cannot account for the spots. But as the spots do not appear when the solution is heated it would seem that they are not due to the paper, but rather something in the manipulation. We are sorry we cannot help you more definitely.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÀ.

WE again remind our readers that this (Friday) evening the Third Traill Taylor Memorial Lecture will be delivered at the rooms of the Royal Photographic Society, 66, Russell-square, W.C., by Mr. F. E. Ives, who has chosen for his subject "The Optics of Trichromatic Photography." The meeting takes place at eight o'clock, and admission is free. We have learnt that Mr. Ives has travelled specially from America in order to read his lecture in person. He proposes treating his subject very exhaustively, and we hope that he will have a large and interested audience. In whatever aspect it is presented, colour photography maintains a firm hold on public attention. Early in the year no meetings were so well attended as those at which Professor R. W. Wood discoursed upon his diffraction grating process. To

this day the young American professor's wonderful grasp of his subject, and his readiness to impart or receive information on any point connected with it, are pleasantly remembered by very many on this side the Atlantic. Of the same splendid type is Frederic Eugene Ives, in whose voluminous writings on the subject of heliochromy one aspiration above all others is apparent, that for scientific truth. The distinction of which Mr. Ives will this evening be made the recipient is richly deserved, for he has largely added to our knowledge of colour photography, and has inflexibly refused to accept any illegitimate advantage in return for his work. When the full history of colour photography comes to be written, we are confident it will be made plain that Ives has borne a great and honourable part in it—all the more honourable because he has steadily held himself and his great knowledge well out of the reach of the unscrupulous company promoter.

* * *

SOME interesting experiments in image transference by means of photography formed the subject of a short communication by Mr. F. E. Ives to the Franklin Institute a few months ago. He showed a photograph which had been made by exposing in the camera a card coated with luminous paint, then removing it to the dark room and placing it in contact with a photographic sensitive plate, which was afterwards developed in the usual way. In reply to a question, Mr. Ives said that he believed the luminous paint card, if it had been kept in total darkness for several days, need not be exposed in the camera very much longer than would be necessary for a photographic sensitive plate, provided that it was exposed with a larger aperture lens and the object illuminated by sunlight, and the card immediately removed to the dark room and pressed in contact with the sensitive plate for several hours. If the card was exposed in the camera for a few seconds under the conditions he had named, it need not remain in contact with the photographic plate for more than two or three seconds. He also showed a photograph which had been obtained in total darkness by the action of reflected heat rays, which were made to form

an image of the object by means of a rock-salt lens. The object was a polished metal key check, exposed to the rays of a limelight, from which the visible rays had been absorbed by a screen. The test screen for this purpose was a sheet of vulcanite. The luminous paint card was first exposed to daylight, to make it evenly luminous, and then to the invisible image, which produced a dark image upon the luminous surface by exhausting the luminosity. The card was then placed in contact with a photographic plate for a few seconds, and the plate was afterwards developed, as in the first experiment. So far as he knew, this was the only photograph of an object ever made by reflected heat rays, made to form an image in the camera. In this week's JOURNAL we also reprint a short paper on the allied subject of "Picture-making in the Dark," contributed by Mr. M. I. Wilbert to the Franklin Institute. The subject is an exceedingly fascinating and complex one.

* * *

As the subject of photographic representations of the Ober-Ammergau Passion Play has lately been referred to in our pages, the remarks published in one of the London daily newspapers of Monday last, with reference to a public exhibition in which photography was the sole agency at work, may be worth while quoting. The report reads as follows:—"It cannot be said that the representation of the Ober-Ammergau Passion Play by means of photographs and animated pictures which was given on Saturday in the Concert Room at the Crystal Palace came up to the usual high level which marks the Sydenham performances. Knowing the great possibilities of animated photography, the audience, who came probably hoping to see the whole of the wonderful Passion Play reproduced before their eyes, met with a disappointment. The programme consisted of a mixture of coloured views of Ober-Ammergau, of photographs of famous pictures representing incidents in the life of Christ, together with a sprinkling of animated photographs of scenes in the Passion Play, such as the Triumphal Entry into Jerusalem, the Garden of Gethsemane, and the Crucifixion, and lengthy explanations. In the brief interval between the two parts of the programme a member of the audience loudly asked whether the photographs had been actually taken at Ober-Ammergau, a question to which no public reply was vouchsafed by the lecturer. At the close of the performance there was an absence of applause, and two or three of those present, who had themselves been at Ober-Ammergau, complained that even the animated photographs bore but little resemblance to the scenes in the play as they were actually performed." Objection seems to have been chiefly taken to the inferior quality of the photographs shown; but, given the utmost excellence obtainable, it is doubtful if the Passion Play is quite suitable as a subject for a concert-room entertainment. But if society generally takes the view that it is, by all means let the photographs be as good as it is possible to get them.

* * *

MR. HOWARD FARMER, in his letter commenting on the report of the examiners in photography for the City and Guilds of London Institute, touches once more on the much-debated question of theory *versus* practice. This is a question which has given rise to endless discussion in the

engineering trade particularly, where there are many highly-skilled, highly-practical men holding responsible positions in eminent firms whose theoretical knowledge is very limited. It is quite conceivable that a man may have a profound knowledge of photographic chemistry and optics, and yet be a poor photographer; and, on the other hand, a man may have a very limited theoretical knowledge and yet be highly skilled and eminent as a photographer. But the practice of photography—*i.e.*, the taking of photographs—is only one aspect, although, of course, a very important one. There is also the manufacturing and the scientific aspect; and it is here where a knowledge of photographic chemistry and optics, and we may add practical mechanics, is essential. It is not quite clear how the examiners arrive at the fact that the elements of photographic chemistry and optics do not receive sufficient attention, because, though the answers to the examination papers may tend to show this, it does not necessarily prove that such is the case. But it is evident from Mr. Howard Farmer's extremely interesting communication that for the generality of professional photographers he rates practical knowledge before theoretical knowledge. "Do not let it be supposed," he says, "that I wish to discourage the study of chemistry or optics—for plate-makers, camera-makers, lens-makers, some teachers, and many others, they are fundamental; to photographers they are useful auxiliaries, but not essential, and should, if possible, be studied as subjects separate from photography, for in the majority of cases, as surely as undue attention is given to what may be termed the science of the subject, so surely will the students go backwards, instead of forwards, in their progress as photographers." This rather curious observation will doubtless receive the attention it deserves, coming from a teacher of Mr. Farmer's extensive experience.

* * *

ANOTHER paragraph in Mr. Farmer's communication is very relevant. It is as follows:—"The City and Guilds give two certificates—one for photography pure and simple, and the other a full technological certificate—to those students only who have studied chemistry and optics, or drawing, and yet, notwithstanding this special certificate for accessory subjects, we get an undue proportion of scientific questions, and a continual complaint of insufficient knowledge of science in an examination which is represented to be for pure photography." It certainly does seem to us that here Mr. Howard Farmer has a distinct grievance. The question as to what constitutes well-directed technical education is a most important one; but it is not at all certain whether the City and Guilds authorities have themselves settled this point. How many of the students at the City and Guilds Technical Colleges at Finsbury and South Kensington, it may be asked, are capable of taking full advantage of the training offered? We doubt not that the percentage is comparatively small; and it is well known that some of the students who pass out of these colleges equipped with a profound theoretical—we might say, to coin a word, professorial—knowledge find it difficult to obtain suitable employment in works. Mr. Howard Farmer further says: "At the present moment this school (at the Polytechnic) is full to its maximum accommodation with professional students, and we have reluctantly been compelled to refuse many entries. May I ask, under these circumstances, what

is the duty of a teacher who feels more painfully every day the misdirection of youthful energies which this excessive forcing of elementary science involves? Shall he also by continually lecturing upon these subjects encourage the less fit and discourage the more fit?" No one can deny that a knowledge of the scientific principles underlying practice is very desirable. At the same time, we must admit that Mr. Farmer has asked a question which it is not easy to answer. We have referred to the technical training given at the City and Guilds Technical Colleges. It might fairly be said that if all the students attending those colleges could take full advantage of the training given, they would all be eligible for professorships when they left. What is desired is the ability to acquire scientific knowledge and the ability to apply such knowledge to practical purposes.

* * *

THE important question of scientific training was dealt with by Professor John Perry in his recent presidential address to the members of the Institution of Electrical Engineers. As the "Times" points out, Professor Perry's address "merits the serious attention of a far wider audience than that to which it is primarily addressed. For it deals not with any special problem of electrical engineering, but with the general question of scientific method and training which underlies every department of industrial activity." Indeed, Professor Perry struck at the very root of our present system of education. He says: "All men should be more alive to the importance of scientific work. It was again the fault of our methods of education that all our great men, our poets and novelists, legislators and lawyers, soldiers and sailors, manufacturers and merchants, clergymen and schoolmasters, remained ignorant of physical science, the application of which by a few men not ignorant was transforming all the conditions of civilisation." When we are agreed as to the importance of scientific knowledge, there is still the problem as to how such knowledge should be imparted. We rather think that, instead of attempting to force a vast amount of scientific knowledge on the young mind in a short space of time, we should commence sooner, and impart the knowledge gradually. The cumulative effort of investigators, inventors, and manufacturers has made the pursuit of photography to modern practitioners a comparatively easy affair; but if it is desired to produce really good work something more than mere manipulative skill is required—a theoretical and practical knowledge of photography, an artistic talent, and an art training are all necessary. And then is the pursuit of photography to be regarded as a profession or a trade? As the "Times" points out, "there are people in many departments of life who like to call their trade a profession, because the word has a loftier sound. But that does not lift them out of the category of tradesmen. If a man is continually dealing with new problems and bringing to their solution alike the systematised results of past experience and the new ideas springing from continual acquisition of new knowledge, then what he pursues is a profession. If, on the other hand, he merely deals over and over again with problems already solved by others, in accordance with formulas to which he has nothing to add, then he is only a tradesman, no matter how he may borrow professional prestige from association with men of a different character."

STUDIO BLINDS SCREENS.

In accordance with a suggestion that the practical value of our recent articles upon studios would be considerably enhanced if some instructions upon fitting with blinds were added, we propose to carry out the suggestion by giving what might be called a few working details. The subject will naturally divide itself under several headings—shape, distribution or arrangement, mode of hanging and working, and material. Before discussing these severally, it will clear the way if we consider the object of using blinds. This may be briefly described as to enable the photographer to modify the direction, the volume, and intensity of the illumination, without requiring any movement on the part of the sitter. We thus qualify the object in view in recollecting the mode of working of a once-famous photographer and contributor to our pages, who, perhaps a quarter of a century ago, did excellent work without having a single blind or screen in his studio. He had a very large working area: the skylight was almost in the middle of the roof, and he obtained every variety of lighting by the simple process of moving his sitter under this light so as to bring it more or less overhead and more or less in front. He produced, as we say, excellent work, the chief objection to his plan being the need of a large studio, especially when, as in the present day, full-length pictures are required, and, further, the undesirability of disturbing the sitter's equanimity by repeated changes of position. Otherwise the plan has many advantages.

Next approaching this plan in simplicity is that once adopted in another studio of using one single blind only. It was a sloping front studio, and one huge curtain, with a sufficiency of slack, was supported under its whole surface on two iron rods. It could be moved towards and away from the sitter, and also, by reason of the slack, to a certain extent sideways. There was thus a considerable, though by no means complete, power of control over what on first thoughts might be considered an unwieldy, bulky arrangement.

There is amongst a large body of workers in studios one singular prevailing idea with regard to blinds or light screens, which should nevertheless be rejected—at any rate, as far as regards its need for light controlling. We refer to the almost universal plan of fixing the blinds close against lights or windows. This means, if we take a room 18 feet wide with 9 feet side walls, and only a 45° pitch of roof, 18 feet from the floor. Such a plan is as useless as it is wasteful of material of construction and time in working. If all the blinds are placed at a height of, say, 12 feet, they are in easy working distance, and easily adjusted if (as, however, ought never to happen with a properly devised scheme) they get wrong and jam. A system so arranged gives as efficient a control as is possible, and is entirely independent of the shape of the roof, which, when single figures were being taken, might be of a pitch of 30° or as high as a steeple without altering the illumination one iota.

Before entering into constructive details there is one more point to be considered, and that is, convenience in working the blinds when once erected. Let us at the outset express our unhesitating opinion—an opinion arrived at after examining the methods of a very large number of studios—that a system without cords or pulleys is infinitely to be preferred. No matter how well devised the system, there is always the liability of the cords going wrong somehow—

they break or stick, or perhaps jerk the whole arrangement on to the floor, and we know these contrepéts always happen at the most inopportune moments. A plan where sliding blinds are moved by a loose rod or pole, though less mysterious than pulling a cord, is infinitely to be preferred. These observations, it will be understood, refer more especially to the heavier opaque blinds, rather than to the translucent screens for diffusing the light.

In purchasing the fabric to be made up into screens, a decision will be required as to the material and the colour. The colour will have to be chosen from several considerations—its power to stand light without fading, the greater or less capacity it imparts to the fabric, and, finally, the extent to which it will harmonise with its surroundings. This latter may seem a matter of no importance to some of our readers, but the harmony of the whole surroundings of the studio should be part of the scheme of decoration, and discordant colour contrasts should be avoided wherever possible.

As regards the fastness of colour, we have seen blue-dyed cotton material used, the under side of which, after ten years' continuous exposure, has been almost as good as on the day it was first put up. Many kinds of fabric lend themselves for blinding purposes, the simplest plan being to inspect all the materials and colours at the drapery stores and choose one with as little stiffening as possible. So long as material of the right substance is selected, we do not think it necessary, or even desirable, that its opacity should be complete, as all the shadowed side of the subject would have a tendency to heaviness, though, of course, this might be counteracted by suitable reflectors. Again, this would be governed by the colour of the walls of the room; if they were light or of an actinic colour, as blue or light grey, the illumination of the subject would be decidedly influenced. At one time it was considered the proper thing to use blue, but it is so crude as a decorative tone that it is now far less in demand than was once the case.

For the blinds or screens of semi-translucent material many substances may be used—nainsooks, muslin, jaconet, or the like; but for general efficiency, combined with the minimum loss of light, nothing approaches architects' tracing cloth, and this is best chosen with a glossy surface on each side. It is more commonly stored with one side dead, but this would not keep clean for so long a time as the other. The drawback of this material is that it will not double or run in folds; it has to be fenced on rigid skeleton frames or used on rollers. It will not be possible to include in a single article all that it is desirable to say, and as we have stretched our space to the utmost limit, as we have already said, we will shortly return to a further consideration of the remaining points which we have classified.

Becquerel Radiations.—We have from time to time made our readers acquainted with Becquerel's investigations into remarkable actinic radiations emanating from uranium and its compounds, and we are pleased to note that the Royal Society have adjudicated to Professor Antoine Henri Becquerel the Rumford medal for his discoveries in radiation proceeding from uranium, and Her Majesty the Queen has been graciously pleased to approve of the award.

Brazing Cast Iron.—There are, doubtless, many of our readers who are amateur mechanics, and occasionally wish to

satisfactorily braze cast iron, which is not such an easy matter. We were present last week at a demonstration in which a piece of cast iron irregularly broken, and with surfaces measuring one and a half inches square, was perfectly brazed in fifteen minutes. The operation consisted of first cleaning the surface with spirits of salts, smearing a special preparation, called Ferrofix, on to the same and then brazing with spelter and a special flux termed Borfix. The joint was so perfect that, even after considerable force had been used with a sledge hammer and anvil, the piece of iron broke in a new place. The operation is so simple that, although we have had no experience in brazing, we successfully brazed a small piece in ten minutes. Mr. A. E. Hubsch, of 3 Broadway, Ludgate Hill, E.C. will be pleased to forward full particulars on application.

Phenomena of Vision.—In reference to the article on this subject in our last, an esteemed contributor has described to us a very instructive experiment on the want of achromatism of the eye which can be made at almost any railway station after dark. Dr. Shelford Bidwell threw on the screen a patch of blue, violet, and of red, for the audience to test the difficulty of focussing both in the eye at the same time. The experiment we refer to is made with one of the purple signal lights now usually seen outside railway stations, and consists simply in observing such a light first with one, and then with the other eye. It is found more frequently than not that the colour appears different with each eye, one eye will focus correctly for distance the blue constituent of the light, which will then appear quite blue; the other eye may find a focus of the red constituent and the lamp will appear red. Experiments like these greatly assist in understanding the achromatism of photographic lenses, though it is to be remembered that the term has by no means the absolute meaning usually attached to it. The achromatism of the ordinary lens is really confined to two colours only, though since the advent of the Jena glasses three colours are combined in the more modern lenses.

Steadiness of Camera Supports.—For photo-micrographic work and other delicate photographic investigations a firm support for the instrument is an absolute necessity, and those who have devoted time to the use of high powers know how next to impossible it is, especially in large towns, to obtain the desired stability. A room in the basement is absolutely essential to avoid the jar and tremor caused by passing vehicles, and is not always an efficient preventive of vibration. Some idea of the extent to which the traffic in great cities induces tremor will be found in the Report of the Paris Observatory for 1899 just issued. M. Bigourdan has made a series of experiments on the subject, and he finds that even at a depth of 87 feet 7 inches the earth is not absolutely free from the effects of vibration caused by the passage of trains, though that attributable to the passage of cabs and omnibuses in the streets contiguous to the Observatory is practically insensible at such a depth. At our own Kew and Greenwich Observatories the great trouble comes from the working of electric railways and trams, which so greatly interfere with magnetic observations that it has been felt necessary to hold a private conference at the Board of Trade to see what can be done to ameliorate matters.

An Early Investigator on the Chemical Action of Light.—A very interesting article upon the investigation of the chemical action of light upon plants, by Domenico Cirillo, appears in a recent number of *Nature* over the signature of Italo Giglioli, and is well worth reading by students of the history of photography. It is more in the nature of what it is the fashion to term "an appreciation" of that unfortunate man, who died a hundred-and-one years ago. It is, of course, outside the province of a practical journal like ours to enter into the life history of plants, but the article shows how near these early investigators were to the discovery of a photographic process; but their work lay rather in the direction of the discovery of first causes than in that of invention. Yet their results are a complete and conclusive answer to the parrot cry of *Cui bono*, so often uttered when descriptions of purely scientific investigation are published. The

references in Signor Giglioli's paper show how many philosophers were working upon the various branches of the one subject, and the marvel is that a process of what we call photography was not thought out before. Nothing is said in Signor Cirillo's treatise or his eulogist's comments upon it to lessen the force of the claims made upon Schultze's first publication in 1727 and of Scheele's vitally important experiments in 1770, but less known names of men who have all worked in the same mental quarry are given. There is mention of Senebier's work in 1782; of Alessandro Barca in Padua in 1782; of Antoin Maria Vasalli, who in 1794 investigated the results of light action on chloride of silver; but, as we all know now, their results had been anticipated by the work of Schultz and Scheele.

A SIMPLE WATER-HEATER FOR CARBON WORK.

It is very remarkable that so few photographers, amateur or professional, take up that most interesting and beautiful of all photographic printing methods, carbon printing. It is simple, easy to manipulate, inexpensive, capable of the widest variety and range of gradation and colour, and is beyond comparison for transparency-making for enlarged negatives; yet how many photographers are there who make any use of it; and what is the cause of its comparative neglect? I take it that the causes are threefold. Firstly, the fatal facility of bromide work for enlarging. Secondly, the fact that so few dealers stock the materials, and nowadays people will not be at the trouble of writing for their photographic requisites, they expect to find them on sale next door. (One reason, perhaps, for this non-stocking of carbon materials is that they afford so little profit as not to be worth storing.) Thirdly, the necessity for the use of hot water.

We are all familiar with the amateur and his dark room—bath room, the sole resource that domestic exigencies permit the enthusiastic worker; but to use it for carbon printing also would involve too many possibilities of obtrusive chemicals in the wrong spot at the wrong moment. As to the professional, he usually has a copious supply of cold water; but when a question of hot water is involved it seems to involve so much "time and bother"—that is the way I have often heard it put—that he does not care to make a start. My present purpose, beyond saying a word in favour of a beautiful and neglected process, is to describe a method I have lately adopted for overcoming the hot-water trouble. My studios have hot water laid on. I have almost every variety of gas-burner for heating purposes, but in summer time we do not always have the fire going that heats the hot-water system, and, excellent as are the gas-burners for heating that are now attainable, their use involves a certain amount of preparation and attention that means loss of time. What is wanted is a self-acting heater where you light the gas, turn on the cold water tap, and have hot water running out. This sounds rather a chimerical expectation; nevertheless, it is an accomplished fact. A hot-water apparatus is constructed that exactly fulfils these requirements, and can be set up without the need of that useful but expensive workman the plumber.

Below will be found an illustration of the apparatus, and a few particulars only are needed to explain how I adapt it to a photographer's requirements.

The apparatus is made by Messrs. Fletcher & Russell, and their own working instructions are as follows:—

Horizontal Pattern.—The use of F. R. & Co.'s Patent Solid Webs for conducting the heat of the burner to the water renders it possible to construct very powerful and efficient water-heaters of an exceedingly small size. This pattern is only 14 in. wide, and 6 in. high over all, small enough to be fixed behind any lavatory without inconvenience. It will deliver one quart of water per minute, heated from 60° to 125° F. (scalding hot). It is free from drip or mess, and is also free from smell, unless worked with an excessive pressure of gas, and beyond its intended power; in this case the tap should be turned down a little until the smell disappears.

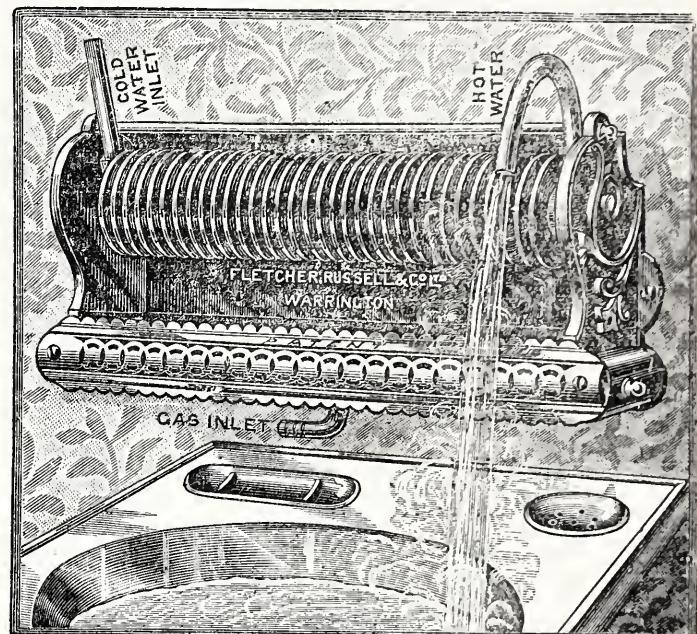
The inlet and outlet are now made at the same end.

This is, as it appears, simplicity itself; but the plumber and his myrmidons looms in the distance, yet I repeat he is not needed

A glance at the illustration shows that three requirements have to be fulfilled.

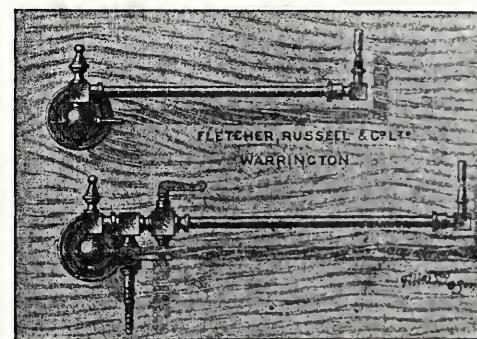
1. The apparatus must be fixed.
2. Gas must be connected to it.
3. Water must be brought to it.

As to the first, all that is needed is to get two pieces of tin or sheet iron about three inches by one, and to nail them about nine inches apart



to the wall, sending the nail through one end and leaving the other end projecting upwards (two nails would add to the stability). There is at the back of the above apparatus a metal plate inside which the two pieces of tin are thrust, and the apparatus is at once suspended.

Connecting the gas to it: Here again Messrs. Fletcher & Co. come to our help. One can purchase for a very small sum a little arrangement illustrated below.



To obtain a supply from an ordinary bracket. The engraving shows a bracket with and without the attachment.

The bracket arm is unscrewed from its position, and the arrangement screwed on instead; and then the arm is rescrewed to the attachment into a place reserved for it. The bracket subserves its usual purpose and has in addition, as will be noticed, a projecting piece to which can be attached an ordinary piece of gas-tubing, the other end of which is attached to the water apparatus.

Third. We are now supplied with gas, and only want the water supplied. This is readily done by attaching to the top another piece of rubber tubing, to one end of which is secured an ordinary self-fitting union, such as one is familiar with in a garden hose, and which costs about a shilling. Further, Messrs. Fletcher & Co., soldered at my instructions a wider piece of metal tubing at the cold water inlet (see illustration), and on this the other end of the rubber tubing is simply slipped. The apparatus is then complete

and ready for use. If required, it can be taken down in a second and brought from one room to another where there is gas and water. If kept in one place, the rubber water pipe can be attached and disconnected in a moment without interfering with the use of the tap for ordinary work.

There is no need for more to be said, the manner of use of the apparatus is as self-evident as its usefulness is indubitable.

G. WATMOUGH WEBSTER, F.C.S., F.R.P.S.

PHOTOGRAPHS IN RELIEF.

PROFESSOR NAMIAS read an interesting note on this subject before the International Congress of Applied Chemistry and Photography recently held in Paris. The well-known property of chromated gelatine and colloids ceasing their water-absorptive power after exposure to light is taken advantage of, and the author stated that he preferred to take the sitter in profile, and to powder the face, and light it in such a manner as to get a strong picture.

The chief point in the process which is novel is the coating of the colloids on a sheet of glass and subsequent sensitising, a mixture of the sensitisier and the colloids not being successful. Another novel point is the increase of the relief by the use of an admixture of gum arabic: the actual mixture consists of—

Gelatine	20 parts.
Gum arabic.....	10 "
Water	100 "
Glacial acetic acid	1 "

The acetic acid keeps the mixture, so that it can be kept in bulk in stock, and a little taken out and melted, when required for use, in a water bath.

When melted it should be poured on to a levelled sheet of glass to the thickness of two or three millimetres, and when set should be dried in a horizontal position. For sensitising, a three per cent. solution of ammonium bichromate with an excess of ammonia should be used. The plates thus prepared require a longer exposure than those that are sensitised with the bichromate alone, but they will keep longer, about ten days, and give a considerably higher relief; the bichromate acts even during the drying on the gum, whilst the monochromate only does this, as is well known, very slowly. It might be thought that the gum would dissolve in the sensitising, but this is not the case.

The exposure under the negative, which should be somewhat vigorous, is rather long, from a quarter to half an hour in the sun, and the printing frame should be so placed that the sun's rays fall on it as perpendicularly as possible.

If the plate is placed in plain water, considerable relief will be obtained; but this is, on account of the presence of the gum, irregular, and shows a coarse grain. This trouble is overcome, however, by placing the plate in a two per cent. solution of alum, to which two per cent. of glacial acetic acid has been added. This solution allows the film to swell without dissolving the gum, for the solubility of the latter is probably the cause of the irregular swelling and the formation of the grain.

After some hours' soaking considerable and perfect relief is obtained, and great resistance, which is not only suitable for casting in plaster of Paris, but also after dusting with graphite enables one to obtain an electro from it. When using the relief for the latter purpose, it is as well to paint the edges of the relief with varnish before or after printing, which prevents the film stripping when for a long time in the acid sulphate of copper bath.

The author points out that the relief thus obtained is very suitable for the reproduction of line drawings for books, and this is much cheaper than the ordinary methods.

PICTURE-MAKING IN THE DARK.

[A paper read before the Photographic and Microscopic Section of the Franklin Institute.]

PHOTOGRAPHY is usually understood to be the production of images by means of chemical changes in certain substances, such as silver chloride, bromide or iodide, by radiant energy. If this be the limitation of the

word, much of what I wish to call attention to in this paper has nothing to do with photography, for, as I will try to prove, radiant energy, as we know or understand it, is not necessary to the production of a true image on a sensitive photographic plate.

It is well known that we are influenced by forms of energy not readily recognised by our unaided senses. For instance, many sounds are not audible to us that are readily recognised by many of the lower animals. The spectrum contains many rays outside of the portion visible to us. Scientists, from time to time, have devised many ingenious pieces of apparatus to aid in discovering, defining and differentiating these obscure forms of energy. The work done in this direction is sufficient to show that there is still a great field for research and experiment. The photographic plates provide us with means of detecting many of these elusive rays, and it is my purpose to call your attention to the ease with which many of these experiments may be carried on.

The pictures are produced inside of a box such as that used for holding dry plates. The sources of energy that may be used to produce images are as follows:—

1. Transmitted light.
2. Phosphorescence and fluorescence.
3. Heat.
4. Chemical energy.
5. Electrical energy.
6. X rays and kindred phenomena.

Ordinary opaque bodies are only comparatively opaque; the common cardboard, though impervious to diffused daylight, is not opaque to direct sunlight.

About four years ago, when the X rays were first announced, many experimenters thought they discovered X rays in sunlight.

The pictures obtained by exposing a photographic plate, properly protected, to sunlight were produced by transmitted light. These experiments may be duplicated in an interesting and instructive way by placing a sensitive photographic plate in a box, so as to have the gelatine side in contact with the bottom of the box, then placing a coin, a piece of glass and a piece of black paper on the box, bottom side up, and setting the combination in sunlight for an hour or two. On developing the plate it will be found that the sun has acted where the plate was not protected by an additional opaque substance. For instance, the piece of glass offers little or no resistance to the rays of light, differing in this respect from the X rays, which are largely absorbed by glass.

Phosphorescence and fluorescence are phenomena that for many years have attracted little attention, but the discovery of the X rays has revived interest in them. About fifty years ago two eminent Frenchmen, Niepce de St. Victor and Antoine Becquerel, whose fame in connection with the development of photographic processes is well recognised, made extended experiments and observations on these phenomena. St. Victor, especially, made exhaustive studies, and among his numerous contributions to the subject, the most interesting, probably, are those on "invisible phosphorescence." He discovered that many substances, while not visibly phosphorescent, would still appreciably affect sensitive silver salts. He also recorded the fact that these substances, or rather many of them, could be protected so that they would retain active properties for some time, such as a week or ten days. The protection to which he refers consists in placing the substance, after it has been exposed to sunlight for an hour or more, in a tin box with a close-fitting lid.

There are many substances that seem to have this faculty of absorbing light and emitting it again in the dark, among them, blocks made of plaster of Paris, white sugar, white, and especially glazed white, paper. Broadly speaking, we may say that any white substance will give us practically the same results. We may take advantage of this property in various ways. If we take, for instance, a print made on a piece of glazed white paper and place it in the sun for some time, then place it in the dark room, face downward, on a photographic plate, leave it there for two or three hours, on developing the plate we may obtain a fair negative. The same result may be obtained with a piece of white marble with black streaks, or a piece of china or a tile with coloured figures.

Heat is a great factor in bringing about chemical changes, and it would be surprising, indeed, if it did not affect the easily decomposed active agents of photographic plates. As a matter of fact, heat contributes as much as any other source to producing fog, or spoiling photographic plates.

Heat may give, under certain conditions, a passable image of metallic objects.

If we heat a coin or a piece of metal having on its surface any design in relief and lay this on a photographic plate for a second or two, then develop the plate, we will find that we have a very fair image of the design.

Chemical action is a form of energy the possibilities of which for picture-making do not seem to have been recognised in this country. In England considerable attention has been given to the effect of chemical emanations on sensitive photographic plates. Among others, Professor W. J. Russell, Vice-President of the Royal Society of London, has made several communications on this subject, especially an exhaustive paper published in the "Chemical News" of a recent date.*

In this paper Mr. Russell offers many suggestions for experiments. He is the first, I think, to observe that the change produced on the surface of many metals by oxidation in air is such that it may be made to record itself on a photographic plate. Among the common metals that may be employed are zinc, magnesium, and copper, and their alloys. Iron seems to have a slight action under some conditions.

The requisite for success is to begin with a perfectly bright surface of metal. The easiest means of obtaining this is by scratching the surface with coarse sandpaper. If we lay the brightened piece on a sensitive plate for several hours, on developing it will be found that the metal has affected the plate to a marked extent. Substances such as glass, celluloid, or thin layers of any metal, do not allow of any action on the photographic plate through them, while such materials as woven fabrics or paper only intercept the action to a limited extent.

Many inorganic compounds will give results of a similar nature. I have experimented with a number, but more with a view of finding penetrating qualities similar to those developed by compounds giving us the so-called Becquerel rays, which I will mention later. Many organic compounds may be used. Among the most active are the "terpenes," chief among them being the ordinary oil (spirit) of turpentine. If we put a few drops of this oil on a piece of porous paper (blotting-paper answers very well), allow all excess of moisture to evaporate and place this paper and a photographic plate together in a closed box for from five to fifteen hours, on developing the plate in the usual way it will be found that there has been a marked change. If we interpose sundry articles between the sensitive plate and the turpentine paper, we will obtain an outline image of the harder and impervious articles, while the pervious or porous articles will allow the fumes to penetrate more or less, depending, of course, entirely on their thickness or porosity. Among the other terpenes that are particularly active I may mention orange, lemon and bergamot oils, any of which will act readily in the same manner.

Speaking in a general way, I may say that any substance emitting oxidising vapours, such as nascent oxygen from hydrogen dioxide, or any strong odorous substance like turpentine, will effect a change in the sensitive materials of a photographic plate. It is generally admitted, I think, that the odour of a substance depends on its emitting a more or less minute quantity of a volatile principle. That this emission does not necessarily affect materially the weight of a substance is readily demonstrated in the case of musk, which will continue to give off the characteristic odour for years, without material decrease in weight.

In this connection it may be interesting to mention that odorous woods, or such as contain a resin or volatile oil, readily impress their images on a photographic plate in the dark, the active agent, of course, being the fumes or odorous vapours that are emitted by the oils or resins contained in the wood.

If we place a piece of Southern pine on a photographic plate, we will obtain, in the course of a few hours, a very good image of the grain of the wood. We may leave a piece of inodorous hardwood, such as hickory, in contact with the photographic plate for weeks without the latter being affected. Another very active agent is linseed oil. This, singularly enough, seems to increase in efficiency for some time, due, no doubt, to the fact that the process of drying is really a process of oxidation, and a comparatively slow one. This brings us to an interesting application of the phenomena. Printers' ink is, or rather is supposed to be, made up chiefly of linseed oil as a base. By taking advantage of this fact we may obtain positive images of printed matter, by simply laying a printed sheet on a photographic plate for some time and then developing the latent image.

Electricity of high potential is another source of energy acting on

photographic plates through almost any protecting envelope. The effect may be accomplished with or without the actual spark.

The pictures produced without actual spark are the most interesting. If we lay a piece of metal or a coin on a plate, enclose them in a box, and then place the box in the influence of the silent discharge of an induction coil, we will, on developing the plate, obtain what looks like a very much over-exposed negative image of the coin or piece of metal. Actual spark pictures, while interesting and sometimes quite pretty, can hardly be said to be good images.

The penetrating qualities of the X rays are so well understood that a mere mention of them will suffice. A closely related, if not identical, series of phenomena, known as the Becquerel rays, has been attracting the attention of scientists of late. These rays seem destined to play a very important part in the development of our knowledge as to the physical properties of matter, and it is even possible that they may lead to a revolution in our theory of matter and its ultimate composition. At the present time much remains to be learned about them. We know that they are emitted by compounds of uranium, thorium, and the supposed new element, polonium.

The compounds of uranium are comparatively cheap and quite active. The rays emitted have the property of traversing opaque substances, very much like the X rays. They will affect photographic plates through an appreciable thickness of wood, cardboard, aluminum, glass, or many other substances, as X rays do. They are largely absorbed by the dense, hard substances, while the softer or thinner layers offer little or no resistance to their passage.

I should add that in making a series of experiments I have obtained decided action on photographic plates by salts of molybdenum, vanadium, cerium, bismuth, zinc, and aluminum. It remains, however, to prove definitely whether this action is due to chemical emanations or to the Becquerel rays.

In conclusion, I would like to say a word as to the "spontaneous emission" of these rays. Personally, I think it would be wise to hold this assertion in abeyance, as from our present knowledge of the subject it is not at all unreasonable to suppose that some one will find a way of generating, or at least of increasing the intensity of these rays, so as to make them available, in an economic way, to take the place of the cumbersome and somewhat costly induction coil and vacuum tube.

MARTIN I. WILBERT, Ph.G.

THE UNAR: A NEW UNIVERSAL LENS OF HIGH INTENSITY.

[Translated from the *Photographische Mittheilungen*.]

The Unar, which was brought out commercially by the Carl Zeiss Optical Works, at Jena, in April of this year, has in a very short space of time found extensive application and recognition. It may therefore be of interest to many persons to learn some particulars of the construction of the lens and the uses to which it may be applied.

In calculating the lens, I set myself the task of finding a type which would permit of the attainment of an anastigmatic, flat field, with large relative aperture, by the most simple means. The image should be anastigmatically flat over a field of sufficient extent for instantaneous exposures, and the aperture should be larger than that of the best objectives hitherto made, viz., f-6.3, with anastigmatic flat field. This aim had been realised in the Planar, which was placed upon the market in August, 1897, but the means were not of sufficient simplicity, and certain limitations to its use for the purposes of the amateur photographer were thus imposed. The price was of necessity high, and the use of the lens was restricted to instantaneous photography, photo-mechanical work, and projection.

The Planar in its smaller sizes has a relative aperture of f-3.6, and an angle of view of 70°. At the same time it is practically free from spherical and chromatic aberrations, so that the focus remains unchanged in using the several stops of the lens. These properties rendered the Planar of particular value as a special lens for the finest line work, enlargements, and projection. For the hand camera with plates 6×9 c. and above, the Planar is too large and too heavy, the lenses of shorter focus, which have an aperture of f-3.6, being of considerable diameter. Moreover, the lens is less suitable for architectural photography, interiors, and landscapes, and, although it is valuable for the most rapid instantaneous work, such as cinematographic and sporting purposes, it still leaves something to be desired for the general wants of the amateur. The Cooke lens—or Triple

*See also *Science*, II. (1900), 487.

Anastigmat, as it is called by Messrs. Voigtlander and Son, Ltd.—is notable for its simplicity of construction and general usefulness, but it is not equal to the Zeiss Anastigmats, Voigtlander's Collinear, and the Goerz and Steinheil lenses. It will be seen from the price lists of the Brunswick firm, wherein the sizes of the plates are given, that the Cooke lens (Portrait Anastigmat), with a relative aperture of $f\cdot4\cdot5$, has an available angle of barely 45° extent, and with an aperture of $f\cdot7\cdot7$ (the Triple Anastigmat) an angle of about 70° . The Portrait Anastigmat is therefore an instrument which can be recommended for portraits, but not for the use of the amateur for instantaneous photography, as the angle of field is too small. The Triple Anastigmat has sufficient angle of field, but its effective aperture is not large enough for very short instantaneous exposures when the light is not good.

Soon after completing the calculation of the Planar, my studies concerning the principle by which anastigmatic flatness of field is attained in that lens suggested a type to me, which, in the course of subsequent closer consideration, led to the Unar as a means of satisfying the requisite conditions.

The Unar, brought out by Carl Zeiss under the Series Ib, is composed of four thin single lenses, and the glasses employed are of the most desirable transparent descriptions in use, and very easily made. The lens has a relative aperture of $f\cdot4\cdot5$, and gives a sharp image over a field of 65° extent.

We would here remind the reader of what has been achieved in modern lenses, prior to the Unar, in comparison to the means employed. The Zeiss Anastigmat, or "Protar," as it has recently been called, has a field of 96° , which is obtained with four lenses and a relative aperture of $f\cdot9$, or with five lenses and a relative aperture of $f\cdot6\cdot3$, a field of 85° . The Cooke lens, with three lenses and a relative aperture of $f\cdot7\cdot7$ or $f\cdot4\cdot5$, a field of 70° and 45° respectively. The symmetric doublets, or Double Anastigmat, Collinear and Orthostigmat, with a relative aperture of $f\cdot7\cdot7$ and six lenses, a field of about 80° . The Stigmatic lens, with six lenses and a relative aperture of $f\cdot4\cdot2$, a field of about 55° . The Planar, with six lenses and a relative aperture of $f\cdot3\cdot6$, a field of about 70° . The Double Protar of Zeiss, with eight lenses and an aperture of $f\cdot6\cdot3$, a field of 80° . The ten lens, symmetrically constructed Anastigmats, have not been used much, and they stand upon the same level as the eight lens instruments in regard to their performance.

In accordance with these figures, the Unar takes a unique position amongst modern anastigmats with regard to its efficiency. Combined with its other characteristics, it ranks as the best adapted lens for all-round work with the hand camera.

The Unar will therefore be of considerable importance for small plates between about 6×9 c. and 13×18 c., provided the manufacturers of cameras understand how to utilise its advantages. The amateur will then be able to avail himself, in practice, of the advantages of a lens of short focus, as compared with one of longer focus, which fact has long been known theoretically. It is acknowledged that the depth of definition of the image is greater, the shorter the focus of the lens used. It consequently follows that a view taken with a lens of short focus upon a small plate will yield more uniform definition when enlarged, and will be more harmonious than the same scene taken directly with a lens of longer focus upon a plate of the larger size. The enlargement issued with this number of the "Photographische Mitteilungen," representing the Palace of Justice at Munich, is from a film negative 6×9 cm., and was taken with a Unar lens at $f\cdot4\cdot5$, focus 112 mm., and demonstrates the fact. The waggons were at a distance of about 10 m., and the building behind them about 60 m. from the camera, and the exposure was made without support. The depth of definition with an aperture representing $1\cdot4\cdot5$ of the focus is sufficient to permit of enlargement to four diameters. Such exposures could not be made with a large camera, quite apart from the fact that the amateur would not care to drag about so large an apparatus in frequented places, and thus attracting the attention of the public.

As it is proved that lenses of short focus give greater depth of definition than those of long focus with the same relative aperture, the opposite must also be true, that for the same required depth of definition a lens of short focus can be used with a larger aperture than a lens of long focus. In using small plates and short focus lenses it is thus possible to give shorter exposures than when using larger sizes. As more transitive incidents may be thus secured, sharper pictures of moving objects and certainly greater facility in obtaining well-exposed plates must also follow. In one word, the possibility is presented of making all kinds of photographs by hand exposure, without a stand, be architecture, landscapes, street scenes, portraits, groups, or

figure studies. In using the Unar for hand cameras of small size a new field of amusement is opened to the amateur, which, besides being an interesting pastime, must also be one of the highest satisfaction. I will overcome further difficulties which stand in the way either of amusement or of art.

The Unar implies the possibility of an instrument for exposure such as the camera-makers have never yet turned out. It is only quite recently that such apparatus has been made, viz., the "Film Palmos," 6×9 , of the Jena Camera Factory. It permits of shortest instantaneous exposures, as well as time exposures of any length. Near or distant objects may be accurately focussed, according to circumstances, and it is adapted for the use of rollable films, with daylight changing. During my recent holiday I have used the apparatus, and I think the results I have secured are very satisfactory. The photogravure published in the present number of this paper will enable the reader to form his own opinion.

DR. P. RUDOLPH, Jena.

SOME AFTER-REFLECTIONS ON THE EXHIBITIONS.

I suppose the recent exhibition of American work was intended by its organisers to be of an epoch-making character. This is a matter of opinion, which time will decide. If every visitor to the show had jotted down his impressions before leaving in a book provided for the purpose, what an entertaining volume we would have had. I really think the organisers ought to have provided a book for this purpose. Perhaps they will do so on another occasion. They ought to have no difficulty in finding a publisher for it, and the profits would help to pay the incidental expenses connected with the exhibition. One visitor's verdict was that there was some very fine work among a good deal that was only fit for the dustbin. What a delightful series of expressions have been called into being by the critics: "Plastic psychological syntheses," "nauseographs," "the cult of the spoilt print," "bubbles," "freaks," &c., &c. Some of these charming phrases will doubtless become classic.

"Individuality at all hazards" appears to be the motto of this "new" school of heaven-sent geniuses, the producers of photographic masterpieces. Some of the stuff shown was probably the queerest that has ever claimed to be art. Some of the things were absolute "doubles"; others were very much under-exposed (perhaps designedly), the result being that we were presented with full-face portraits of persons appearing to possess but one eye; others were allowed two eyes, but no body. Some of the "masterpieces" exhibited to an unbiased and unprejudiced person were not even clever; they were only queerly titled. Two were most appropriately entitled "Uncertain" and "Still Uncertain." Some of these American workers do not appear to be very fortunate with their lady models or sitters. Certainly in this country we could do with a little less adherence to convention. By all means let us have naturalness in pose and expression, but if some of the things shown at the recent exhibition of American work were not spoilt prints, it is absolutely certain that similar things produced in this country have, up to now, been considered so. But there are plenty of people ready to prove that black is white.

Works of art need not, of course, be pretty, but they ought, at least, to be intelligible; and some people prefer them to be agreeable. No mortal man could understand some of the "pictures" exhibited by these American geniuses, and even their most ardent followers have admitted this. Some of the work the writer thought very good indeed, and such can be appreciated just as well by those who have relentlessly criticised and ridiculed some of the absurd pretensions of those who ask us to read a story where no story, and apparently no motif, exists, as by those fulsome flatterers who lump the lot together and call them all photographic masterpieces. Had the rubbish been weeded out, we would have had a fine show, if somewhat small. At least that is the humble opinion of the writer.

As the Salon is a private Society, nobody has much right to question its right of existence; but it would be rather interesting to know how it would fare if it were not held contemporaneously with the larger exhibition. This, coupled with the fact that the New Gallery and the Egyptian Hall are in close proximity, is certainly not detrimental to its success.

The strongest supporters of the Salon would hardly claim that photographers journey from the provinces specially to inspect the not very numerous works exhibited there, and merely visit the exhibition of the Royal Photographic Society as an after-thought, or to fill in a spare hour or two. Comparisons are odious; but, for my part, if it was a question of one and sixpence—a shilling for entrance and sixpence for the catalogue—I have not two opinions as to which exhibition I should visit. Many of those exhibiting at the Salon also exhibit at the larger show. There was some choice work at the Salon, of course, as would be expected when the producers are men (and women)

of taste, culture, and refinement; but precisely why there should be two exhibitions held contemporaneously it is not easy for the uninitiated to understand. The photograph most popular, from a selling point of view, was of small size, and a straightforward piece of work—certainly neither a "fuzzygraph" nor a "faked" photograph. Perhaps next year the Royal Photographic Society will woo the Salomites, and get them to reconsider whether it is not possible to patch up any petty differences that may exist. I know that this is dangerous ground, but it seems to me that the Council of the Royal Photographic Society is desirous of encouraging and fostering photographic effort in every way. There were many works at the larger show not dissimilar in aim and object to those exhibited at the barn-like Salon. The professional, however, does not seem to have responded very freely to the Council's invitation. But, taking it on the whole, most visitors will doubtless agree that it was a most interesting show, and a credit to all concerned. This includes those who were responsible for the catalogue. But what a hubbub the exhibitions make.

J. A. REID.

THE INTENSIFICATION OF CARBON PRINTS.

[Paper read before the London and Provincial Photographic Association.]

It is my intention to-night to bring before your notice a few experiments I have made during the last few months in the intensification and after-manipulation of carbon prints, and I may say that for the purpose of this paper I have gone somewhat further into the matter than I otherwise should have done, and I shall endeavour to show you at a later stage that almost any colour may be obtained on one class or colour of tissue by the means of what are generally called intensifiers, a word, by the way, that I rather object to, as, so far as I can see, carbon work is not intensified at all, so far as we understand the word.

What takes place is, I think, a dyeing of the gelatine in the tissue. I stand, however, open to correction on this point, which needs a more able chemist than I am to work out. But I am, perhaps, getting on a little too far, and maybe a little wide of my subject; and to enable me to show you a few results, and how I obtain them, I ask you to bear with me a short time whilst I develop one or two prints.

I take this course because I find that the intensification or dyeing takes place much quicker and the results are, I think, better when done direct from the last washing than if allowed to dry.

In all books on the carbon process I have access to, particular stress is put upon the fact that the prints must not be touched with the fingers or anything during development. Well, as I have at times 400 to 500 prints to get through in a day, you can quite understand that I cannot give the time needed for automatic development that I should were I dealing with some six or seven prints or working for mere pleasure.

The result is that I more often than not hurry up development in the way I now show you, giving the print first a short soaking in the hot water. I take, as you see, a common letter-book damper brush and gently sweep the larger part of the spare pigment off quickly. Another short soaking, a gentle splash or two, and our print is done.

I do not, of course, recommend this plan to every Tom, Dick, and Harry, or for every make of tissue. Elliott's is what I am using to-night, and is the make I have used throughout my experiments, and I would here say that their transparency is not to be treated in this rough and ready 'way, owing to its lack of gelatine.

What is wanted is a tissue containing a fair amount of gelatine, a brush that is soft and free from grit, and a very, very light touch.

This is a five per cent. solution of pot. permanganate, and we shall find our print after a few seconds in this solution has changed to a very nice deep purple, which will, you will find, change to a rather pleasing brown during the final washing, which need not be more than three or four minutes under running water. I may say that you can by longer immersion in the permanganate bath get the denser parts absolutely opaque.

The exact change that takes place I am not chemist enough to say, but possibly the pot. permanganate is decomposed, and an oxide of manganese formed. Should you by any chance get your print too deep, you may reduce or discharge the colour by an application of a weak solution of ammonio-sulphide, as you see. At this point, I had obtained exactly what I wanted at the time, and here I left the process until two or three weeks ago, and I have during that time gone somewhat further and tried various analine dyes, using both glass and celluloid. Speaking of celluloid brings to mind an article that appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY of October 23, from, I think, an American source, to the effect that by using this material as a base for the pigment the safe edge and any transfer could be entirely done away with by printing from the back of the celluloid, being so thin as not to interfere with the sharpness of the image. I myself worked somewhat on these lines some two years ago, squeegeeing the freshly sensitised tissue direct on to the celluloid, and allow-

ing it to dry in contact. I pass round one or two results so obtained, along with a piece of opal for backing them. Of course various coloured papers or metals might be used for backing purposes, and thus some very pretty effects could be obtained. Those who object to the glazed surface have, of course, only to use matt celluloid, which is just as handy to obtain as the plain.

I had intended to demonstrate the use of the various dyes here, but the quantity of bottles and dishes required, about eighteen each, put a stopper on this, so I content myself with the next best course and made results, using engraving black tissue. I tinted the prints with green, blue, brown, scarlet, magenta, violet, black, and mauve dyes.

You will see from these prints that an almost endless amount of colours can be obtained. I also pass round a few prints made on various coloured tissues, and treated with various dyes, as marked on the back. For the dyes I have not yet sought for any reducing or discharging agent. As to their permanency I cannot say; at the same time I see no reason why they should not stand, providing, of course, that your dye is not a known fugitive, or, at any rate, made to do so by treating with a mordant, chrome alum or tannic acid, for instance. Here I must leave what has been to me, and I hope to you, an interesting subject, and in doing so I think I cannot do better than ask you a question that has occurred to me again and again, and that is: If the gelatine contained in carbon pigment lends itself so readily to these dyeing processes, why cannot a gelatine treated with pot. bichromate only be used in the same way?

E. HUMAN.

POLITE PHOTOGRAPHY.

Mr. Harold Baker favoured a crowded assemblage of the members of the Croydon Camera Club on Wednesday, 7th inst., with his views and hints upon taking people at their best, and treated his hearers to a delightful and profitable discourse on certain technicalities of posing, exposing, lighting, &c., his remarks being illustrated by a number of lantern slides and of large prints. A remarkable illustration of the peculiar effect on time of exposure by changing the backgrounds was shown. Contrary to what might be generally expected a figure posed before a white background was said to need thrice the exposure of what would be required were a black background used. To avoid the need for much retouching isochromatic plates and a full exposure were prescribed. Speaking about the amateur, Mr. Baker said that the professional was very much the worse off, as instead of being able to pick his time and subject, he had at almost a moment's notice to turn out a flattering picture of the most impossible of sitters. Some ladies, too, had a remarkable faith in the power of the camera to conjure. Thus one called on the lecturer with a portrait by him representing a girl's fascinating face framed in a mass of luxuriant golden fluffy hair. "I want you to do my little pet just like this," said she. Her little pet turned out to be a plain child with dark short-cropped hair. A number of instructive studies were shown indicating badly posed hands, and compared with others of the same model, in which a better arrangement was arrived at. A good many other points of similar import were touched upon, and some much-appreciated anecdotes related, from one of which one may guess that the portrait painter sometimes owes more to the photographer than is suspected.

In the subsequent discussion, Mr. Ralph W. Robinson spoke of the importance of unobtrusive backgrounds, of the value of facial expression in the making of an acceptable portrait, and stated that too much importance was apt to be placed on the studio and apparatus at command. His "at home" portraits, which the President had so flatteringly alluded to, were taken wherever his sitters happened to be with an ordinary R.R. lens. The great point was to know what to aim at, and then a little common sense and experience would enable the photographer to get what is wanted.

In reply to a question respecting the value of Mr. Smith's oxy-magnesium portrait lamp, Mr. Baker said he had not yet been able to try it for portraiture, but intended doing so. Only the previous day he had been asked to photograph an interior which six other firms had refused to attempt. To accomplish this he had used Mr. Smith's lamp, and by its aid obtained pictures of the above which were unusually charming examples of interior work.

NOTES FROM THE NORTH.

THE weather, photographically and otherwise, has been very wretched for the last three or four weeks, and studio work has been slack. No complaints are heard from the dealers. The lantern season is in full swing, with an increased demand for the cinematograph. Some evenings every available operator is out, and orders have to be refused. Already, too, there is a brisk demand for Christmas and New Year card mounts, a line in which the amateurs have undoubtedly shown the way to their professional brethren. Even yet a bromide midget is the best many a professional has to offer in the way of an artistic

Christmas card, although, as Mr. John Stuart says in his seasonable announcement, the interior of a favourite room, a picture of one's home, &c., may make a very pretty card, possessing an intrinsic value which the ordinary commercial card does not. It isn't a question of price, as a section of the public are ever prepared to pay for ideas what their creators ask.

On every hand one hears impressions of the London shows from those who were fortunate enough to see them. It is emphatically a case of "tot homines quot sententiae," as the Romans used to say, or as our own poet put it, "No two watches are alike, yet each believes his own." There is general agreement regarding the position the Royal Society now holds as the headquarters of the art, and satisfaction that it is at last housed in worthy premises.

Early as the lantern and cinematograph season is, complaints are heard of the thoughtless and cruel treatment of operators sent into country districts. Many responsible for such entertainments seem to think the canons of hospitality have been observed in the spirit and in the letter if they offer the young man a glass of whisky. In these cases it is whisky or nothing, although a refreshing cup of tea or coffee with a slice of toast would send the grateful operator home by the midnight train with a heart overflowing with gratitude. When, as occasionally happens, the hapless operator has to spend a Sunday in a district unblest with an hotel, he often finds himself put on prison fare and miserably housed for the night. One operator who lately had an experience of that nature was off duty for a week, and he was supposed to be the guest of a clergyman.

Tanqueray is endeavouring to secure dupes in this quarter. His well-known circulars are being delivered wholesale by the Post Office. He must be using an out-of-date as well as a copy of the current issue of the Glasgow Directory, as I have received one of his "offers" at my present address, and another which was sent first of all to the address at which I was to be found up till May, 1898. There is no saying how their names come to be in his list of "customers who had portraits made in our studio, and are delighted with our work," but it may mislead some to find his methods recommended by a well-known Glasgow Bailie and by an equally well-known Glasgow physician. Among the press testimonials is one, professedly, from the "Scotsman."

There is happily, generally speaking, little or no cause for jealousy on the part of the professional worker of the efforts of the amateur, but a black sheep does stray into the amateur fold on occasion. The office-bearers of one of the Glasgow Amateur Societies lately received a hint that an advertisement offering cheap enlargements was appearing in a country paper, and that there was every reason to believe it had been inserted by a member of the Society, and that the cheap enlargements were being made in the Society's rooms with the Society's apparatus. Inquiry practically substantiated the charge, and steps were immediately taken to put an end to such wilful misuse of the Society's privileges. No one is more ashamed of such double-dealing than the amateur who is disinterestedly interested in the welfare of photography.

Formal invitations have now been issued by the Committee of the Photographic Section of Glasgow International Exhibition 1901, of which Mr. James Craig Annan is Convener. The various societies have been invited to make up a collection of work done by their members to be submitted to the Committee for the approval. Judging from the promises of support, the section will comprise the finest collection of photographic art ever brought together under one roof.

The Glasgow Photographic Association has fallen upon evil days. For three or four years past its membership, while suffering from the inroads made by death and resignation, has not been recruited by as many as half a score all told. The monthly meetings for several winters have been attended by a handful, and altogether it seemed as if the Association would shortly cease to be, through sheer decay. Rather than court this fate, the office-bearers and the faithful few who answered their summons to a recent general meeting resolved to suspend the Association meetings for a twelvemonth. If it is found by the beginning of next winter that the meetings have been missed, and that there is a prospect of another term of usefulness before the Association, they will be resumed. In Mr. Charles Macdonald the Association has of late had a most enthusiastic and energetic Honorary Secretary, but he found it impossible to galvanise into life what was plainly moribund. He hopes, however, to organise a "Smoker" during the present winter so that the "faithful" may not entirely lose sight of one another during the period of hibernation. As this was the professional Association par excellence, the "bread and butter" men are now without a visible nexus.

Full advantage was taken of the photographic possibilities presented by that great ecclesiastical event, the Union of the Free and United Presbyterian Churches. Since May last, when the Union passed the border line of probability and became an all but accomplished fact, Mr. Thomas Pursey, 2, South Charlotte-street, Edinburgh, has been engaged on a commemorative picture of the U.P. Synod. The members were photographed individually to the number of about 900, and then skilfully grouped so as to make up a faithful representation of the Synod in session, with the Moderator at his desk, the clerks at

the table, the members crowding the area, the ladies and others in the side seats, and the public galleries occupied. The picture is now nearing completion. During the Union Assembly week Mr. Pursey's studio was visited by over 2,000 members, who were more than astonished on finding themselves face to face with a picture measuring twelve feet by six. The picture is to be reproduced in various sizes and processes ranging in price from two guineas to ten. Mr. Pursey has also on hand a commemorative picture of similar interest and proportions of the last Assembly of the Free Church of Scotland. Both are very certain to be paying ventures.

The limelight lantern as an educative agency has long enjoyed the approval and stimulus of the Glasgow Corporation, but its scope is to be greatly extended this winter, the intention being to enlighten the citizens regarding the great enterprises on which the rates are being spent. It will be seen from the syllabus given below that the course of lectures, admission being free, covers a very wide range, and as each lecture is to be given by the responsible official of the department concerned, the matter of the lectures will be thoroughly trustworthy. The officials have gone very heartily into the scheme, the task of lecturing in public being by no means new to most of them. With the Corporation purse at their service, nothing will be lacking to make the course a success. The scheme is one sister Corporations may be expected to copy, and by and by there may be an interchange of slides and lectures that the leading Corporations may become better acquainted with each other's work. The following is the syllabus:—

- November 10, 1900—"The Water Supply," by Mr. Robert Wilson, Treasurer, Water Department.
 November 24—"The Municipal Electric Service," by Mr. W. A. Chamen, Electrical Engineer.
 December 8—"The Houses of the Poor," by Mr. Peter Fyfe, Chief Sanitary Inspector.
 December 22—"The Cleansing of the City," by Mr. D. M'Coll, Superintendent of Cleansing.
 January 12, 1901—"Subterranean Glasgow: How the Sewage Reaches the Sea," by Mr. A. B. McDonald, City Engineer.
 January 26—"The Fire Brigade," by Mr. Wm. Paterson, Chief Officer of the Fire Brigade.
 February 9—"The Gas Supply," by Mr. A. Wilson, Manager, Daws-holm Gas-works.
 February 23—"The Haunts of Disease," by Dr. A. K. Chalmers, Medical Officer of Health.

ON SUBMITTING PHOTOGRAPHS TO THE ILLUSTRATED PRESS.

SOME interesting letters recently appeared in this JOURNAL respecting the question of the disposal of blocks after they have been used by the journals to which the photographs, from which the blocks had been made, had been contributed. It was stated by a correspondent that, requiring blocks which had appeared in the illustrated press for the purpose of illustrating a book, he wrote to the respective journals, and obtained the blocks desired. He was informed that it was not necessary to consult the various photographers concerned. The question naturally arises, Have editors any right to dispose of photo blocks in this way, reference being made, of course, to blocks made from photographs submitted in the ordinary way, and not photographs which have been specially taken for the journal in which they first appeared, and reproduction fees paid accordingly?

When photographs are submitted to journals for reproduction, it is inferred that all that is being disposed of is the right to reproduce the photograph in that particular journal to which they are contributed, and the writer cannot see that any statement in writing to this effect should be considered necessary. There can be no doubt, however, that it is necessary in many cases. There is reason to believe that quite a business is being carried on in the disposal of blocks that have been reproduced in certain of the illustrated papers. If the editors or the managers of the journals in question claim the right, after paying a few shillings to the photographer, to dispose of the block to anybody willing to purchase, they will, doubtless, also consider that they have the right to dispose of facsimiles of the block to more than one person, and blocks of the original photograph might be thus used by an indefinite number of persons and an indefinite number of times, the photographer not being consulted at all.

Only the other day a letter appeared in one of the leading literary papers from a well-known traveller, who complained that some valuable photograph taken by him had been made use of in an important book of travel without permission or acknowledgment, and that he was taking steps to put the matter right.

Proprietors of papers have had to pay heavy damages for disposing of photo blocks for further reproduction purposes without the sanction of the photographer. This is in the case of copyrighted photographs; and, as a protective measure, all photographs used for reproduction purposes should be copyrighted.

No editor of an illustrated journal would care to take the risk of disposing of the blocks of photographs taken by firms represented on the Committee of the Copyright Union. The photographs of such firms are

to a great extent the stock in trade of many of the illustrated journals, and friction with them would not be politic, apart from the question of expense.

There can be no doubt that the Copyright Union is an excellent trade union. By its rules no member shall allow a copyright portrait photograph or a copyright photograph of landscape or public ceremonials which belongs to him to be reproduced for a less fee than 10s. 6d. Such fee gives the right to use the photograph for one issue only.

There must be many other photographs which could not be described as a portrait, landscape, or public ceremonials, which might be regarded of considerable value, not necessarily of great commercial value, by their authors, such as of scientific phenomena, &c.

Therefore it might be considered that the wording of the rule is not sufficiently comprehensive. The leading members of the profession know how to protect themselves, however.

We might briefly consider the case of the humble amateur who may desire to minimise his photographic materials bill by contributing stray photographs to the illustrated press. Providing that the photograph is sufficiently striking, and that it is reproducible, it may be regarded as possessing value for this purpose, but in many cases considerable difficulty would be experienced in obtaining the Copyright Union's minimum reproduction fee. Moreover, some editors accept photographs and hold them over indefinitely; and, through some cause or other, they may never be published at all. And in some cases great difficulty will be experienced in obtaining payment for published photographs.

It cannot be too strongly urged that photographs to be used for reproduction purposes should be copyrighted, and care should be exercised so that the copyright of such photographs is not signed away on receipt of the few shillings received for the use of the photograph. No respectable journal would demand this.

J. R. ELSTOW.

THE GLASGOW CAMERA CLUB EXHIBITION.

THE Annual Exhibition of the Glasgow Camera Club, late the "Evening Times" Camera Club, was held in the club room, 46 Gordon-street, Glasgow, on Monday evening. The show is mostly confined to members' work, there being only one open class, and even the catalogue shows that the majority of the members do not send in to the annual exhibition. This is a pity, as members should remember that they are part of a corporate body, and the strength of that body depends on the active support to its welfare given by the individual parts thereof. Too often do we find that, while many members are willing to accept all the benefits a Society has to offer, they make no effort to in any way help forward the prosperity of the Society by their assistance, but leave all the work to a few who really have the welfare of their Society at heart—but this is a digression.

About 100 pictures and 20 sets of lantern slides are exhibited. The Society, we notice, still adheres to the antiquated system of dividing the classes according to size, and, for what reason we know not, has sprung a new class upon us, viz., "Prints in Glossy P.O.P."—there's a novelty, just after all the critics had seemed to agree that P.O.P. for exhibition work was dead, we find a class specially devoted to it.

The most successful exhibitor is James Douglas. In Class A, under half-plate, he is second with "Swamp," a hard rendering of a commonplace subject with an awkward wave of light in the sky. In club outing work, he is first with "Silver Birches." The lighting is well managed, and the quality of the birch is well rendered. In lantern slides he occupies second place with a set of good figure studies, clear in technique, figures well and naturally arranged, and good sunshine effects. In the Open Class Mr. Douglas comes in first with his painter-like, "A Portrait Study." It is easily first in its class, and is a strong portrait drawn with no nervousness, but with a firm and confident hand.

We should next notice Thomas Walker, who takes first place in the Novice Class with a good group of fisher laddies, the standing figure is not like the rest of the "loons," but the main group is singularly happy in its composition. In the Lantern Slide Class our friend the novice comes in first, beating some much-bemedaled workers. His set of landscape displays good clear technique, while he shows the effect of strong sunshine without the aid of mudflats, &c.

A. H. Duncan, an old friend of the Club and a strong worker on its behalf, takes first place in Class A with "Beach Study," which shows a well-composed foreground, and second in Class B with "Harbour" (Millport). The subject is one that would specially appeal to the "stock-view" worker, but Mr. Duncan has lifted it out of the ordinary rut, and given us a pleasing picture.

W. L. Primrose, who has many successes to his name, has to be content with a first in Class B, where an architectural study, "Ripon Minster," gives him first place, but it is not in Mr. Primrose's best vein. We have seen him turn out very much superior work to what he exhibits on the present occasion.

J. Peat Miller (Beith) takes the bronze medal in the Open Class with a beautiful study of a child's head, which clearly betokens that, although he has now made photography a "bread and butter" question, yet he has not forgotten how to turn out a good thing.

Messrs. J. Craig Annan, F. H. Newbery, and W. Goodwin acted as judges.

The following is the full prize-list:—

Class A—Any subject; size, half-plate and under:—Silver medal, A. H. Duncan, "Beach Study"; bronze, James Douglas, "Swamp."

Class B—Any subject; size, about half-plate:—Silver medal, W. L. Primrose, "Ripon Minster"; bronze medal, A. H. Duncan, "Harbour" (Millport).

Class C—Club Outing Work:—Silver medal, James Douglas, "Silver Birches"; bronze medal, James Gray "After the Day's Work" (Waterfoot).

Class D—Confined to those who have never won a prize:—Bronze medal, Thomas Walker, "Young Fishers."

Class E—Lantern Slides:—Silver medal, Thomas Walker; bronze medal, James Douglas.

Class F—Prints on Glossy P.O.P., any subject, any size:—Bronze medal, John Gibb, "In the Woods."

Class G—Open Competition, any subject, any size:—Silver medal, James Douglas (Glasgow), "A Portrait Study"; bronze medal, J. Peat Miller (Beith), "Study of a Head."

Our Editorial Table.

PHOTOGRAMS OF THE YEAR, 1900.

Published by Dawbarn & Ward, Farringdon-avenue, E.C., 192 pp., illustrated, price 3s. THE sixth issue of this welcome annual adheres closely to the lines that were traced by its predecessors, although it appears to us that for the purposes of illustration less reliance than hitherto has been placed upon publicly exhibited photographs. Many of the pictures in the book will, therefore, be new to the great majority of its readers, who, besides that, have been given little opportunity of studying reproductions of work by the new American school. Here and there the illustrations to "Photograms of the Year" are commonplace, and we cannot avoid the impression that this department of the book shows signs of some lack of discrimination in selection. But we are aware that the Editors' task must be full of difficulties, and that they cannot always reproduce all the photographs they would like to. The literary contents of the volume are decidedly more interesting than anything of the kind we have before read in "Photograms of the Year." The very notable paper called "Bubbles," which Dr. Emerson contributed to the Newcastle Convention (a paper, by the way, which Conventioners may be interested to know has been reproduced in photographic periodicals all over the world), is here reprinted, and references are given to the photographs, reproduced in "Photograms of 1899," which the Doctor very trenchantly criticised. "Bubbles," therefore, is quite a valuable little study in constructive and destructive criticism. A feature of the book is Mr. A. R. C. Carter's detailed review of the two "great" (why "great"?) Exhibitions. Mr. Carter is a professional art critic, and his well considered opinions printed in the book before us should appease those persons who declaim against the shortcomings of weekly photographic criticism. The international character of the book is well maintained, Mr. Demachy writing of French pictorial photography, and Mr. J. T. Keiley representing America. In all seriousness we advise the latter gentleman to be less querulous and petulant towards those who differ from him in matters pertaining to pictorial photography. This advice, too, may be tendered to Mr. Keiley's fellow clubman and worker, Mr. Steichen, who has apparently crossed the Atlantic to demonstrate the fact that endurance of adverse criticism is not the forte of the new American school. "Photograms" of 1900 should be in the hands of all those who are interested in the trend of modern pictorial photography. It is well produced and printed.

INTRODUCTION TO MODERN SCIENTIFIC CHEMISTRY.

By Dr. Lassar-Cohn, 348 pp., 58 illustrations, price 6s. London: H. Grevel & Co., 31, King-street, Covent Garden.

THE translation of this useful book has been done by Mr. M. M. Pattison Muir, M.A. It is such a work as one who has mastered the elements of his subject may take up as a guide in his more advanced studies. Dr. Lassar-Cohn appears to have used care in keeping abreast of recent discoveries, for in his list of the elements we find argon, helium, neon, krypton. Some lately-published tables that we have seen do not contain mention of these new elements. Again, acetylene duly finds a place amongst the illuminating gases described. As a means of mapping out a systematic study of the principal elements, the book should be found of the very greatest service by chemists. Dr. Lassar-Cohn is happy in his translator, for his lectures, as they are here printed, are reproduced in simple language which goes straight to the understanding of the student—a valuable feature, not always to be found in chemical text-books. The illustrations are not so good as they might be; but this is only a minor drawback to an otherwise valuable little manual.

THE DOUBLE-WEIGHT CARBON VELOX.

Manufactured and sold by J. J. Griffin & Sons, 20-26, Sardinia-street, Lincoln's Inn-Fields.

MESSRS. GRIFFIN are introducing a new grade of velox, called double-weight velox, in reference to which they kindly send us the following explanatory notes:—"The carbon velox is the most popular of the seven grades, and its introduction in double-weight thickness is in answer to repeated requests from regular users of velox. It differs only from ordinary velox in thickness, the manipulation being precisely the same. On account of the heavy backing to the emulsion, double-weight velox gives more detailed and delicate prints than with papers of ordinary thickness. The choicest results are obtained by printing with a white margin, paper somewhat larger than the actual photograph being used. A more roomy printing frame than usual is fitted with plain glass upon which the negatives must be placed. Strips of black paper are pasted over the edges of the negatives and made to extend sufficiently to form the desired margin. No mounting is required. It is very convenient for prints to be carried in the pocket-book. The paper will take ink or colour, and is therefore most useful for making Christmas, postal, or New-year cards, giving charmingly soft and effective results."

Double-weight velox is put on the market at an opportune moment. The specimen print sent (one of admirable beauty and delicacy) shows that the process is very well adapted for postal or for Christmas card purposes, for which we strongly recommend it to our readers. We congratulate Messrs. Griffin on their ingenuity in providing photographers with many refined and dainty ideas in printing.

CONTRIBUTIONS TO PHOTOGRAPHIC OPTICS,

By Otto Lummer, D. Ph., translated and augmented by Sylvanus P. Thompson, D.Sc., price 6s. London : Macmillan & Co., Ltd., St. Martin-street.

WE look upon this volume as one of the most valuable contributions to the literature of photographic optics which has appeared in the English language of recent years, and we feel that the student of this branch of optics owes Dr. Sylvanus Thompson an expression of gratitude for the recognition of the merits of Professor Lummer's papers, and the careful and lucid translation he has made of them. The papers were first published in the "Zeitschrift fur Instrumentenkunde," in the latter half of 1897, and have great merit as a clear exposition of a complicated subject. Dr. Lummer's object was to set out the theoretical considerations which must be taken into account in forming a judgment of the possible performance of a lens. This he does by discussing the various aberrations, and showing how they may be removed by judicious combination of the various factors of construction in different lens types. To formulate the conditions which must be fulfilled, Professor Lummer gives an account of Seidel's theory, and in an appendix Dr. Sylvanus Thompson gives a detailed account of this theory, which will be much appreciated by the reader who is unable to read the original. A second appendix is on the sine-condition, which is taken from Professor Lummer's edition of the "Optics of Muller-Pouilles." The third appendix gives Seidel's formulæ for calculating the path of a ray through an optical system. The investigations which led up to these formulæ were undertaken by Seidel at the request of his friend, C. A. Steinheil, and the formulæ were used by Dr. Adolph Steinheil in calculating the Aplanat.

Dr. Thompson has made certain additions to Professor Lummer's text, and has devoted an additional chapter to some recent British objectives. He is infelicitous in describing the Satz-anastigmat as a wide-angled portrait lens, when used in the double form, and the statement that the concentric lens with aperture ratios of $f\text{-}16$ to $f\text{-}45$ gives excellent definition, misses the purpose for which the larger aperture was given to the lens—namely, the attainment of soft and artistic effects. For good definition the makers recommended the use of stop $f\text{-}22$, or smaller. Details of the construction of the stigmatic lens are also given; likewise an account of the Cooke lenses. Dr. Thompson is in error concerning the collinear lens of Voigtländer. This is not manufactured in England by Messrs. R. and J. Beck. They are the licensees for the manufacture of Steinheil's orthostigmats. Although the collinear was made in Germany prior to the orthostigmat, the manufacture of the collinear is by license from Messrs. Steinheil. Some particulars are also given of the new Zeiss lens, the Unar, and as this is the latest lens from the Jena factory, these particulars are of much interest. Turning to the telephoto lenses, we find the illustration, a view of Munich, attributed to Dr. Miethe. A reference to Eder's "Ansfnührliches Handbuch der Photographie," in the volume on photographic cameras, will show that these photographs were taken with Steinheil lenses, and that they are supplementary to an article by Dr. Adolph Steinheil on telephotography.

We have drawn attention to these errors, which are of minor importance, in case it is found desirable to issue a second edition of the volume. The work, as we have already said, is of great merit, and Dr. Sylvanus Thompson has rendered a service to photography by publishing it.

PENROSE'S PICTORIAL ANNUAL: THE YEAR BOOK FOR 1900.

Edited by W. Gamble. London : Penrose & Co., 8, Upper Baker-street, Lloyd-square, W.C.

WE heartily congratulate the accomplished editor, Mr. Gamble, and all concerned in the production of this superb book—a very mirror of the present stage of photography as it is applied to the purpose of illustration. It is the golden age of process work, according to our authority, and the completeness with which photographic blocks monopolise the non-textual portions of modern books as illustrations lends support to this pretty fancy. The introductory article on "Catalogue Illustration," by the Editor, contains a wealth of sound advice, which we strongly urge those photographers who make a specialty of working for reproduction to take the opportunity of perusing. It is the outcome of sound practical knowledge. The remaining articles on monochrome and colour work are by such authorities as General Waterhouse, Max Jaffe, H. Schnauss, Chapman Jones, M. Wolfe, E. Senior, Namias, Zander, &c. There are hundreds of specimen illustrations, flawless as reproductions, if occasionally uninteresting as photographs. But this is no more than saying that the book is a splendid example of printing and get-up. "Penrose's Pictorial Annual" is a sure guide to the present position of process work, and it should find its way to the desk of everybody directly interested in the subject of modern illustrations.

Studio Gossip.

LIME Water for Reducing Carbon Prints.—The "Photo-American" states that Dr. S. Hendrickson, of Brooklyn, has been perfectly successful in reducing over-printed carbons by the use of a more or less weak solution of chloride of lime. Our contemporary adds:—"We have often had the ill-luck to over-print when making carbons, and unless extra hot water (which is pretty sure to blister the prints) would bring them around, there was nothing to do but throw them away, or else use as a transparency. As the lime would not act on the unalterable pigment; this property of reducing must be due to the fact that lime does eat gelatine wonderfully fast, and hence attacks the gelatine that holds the pigment in suspense. Dr. Hendrickson states that if a strong solution be used, or if the prints are left long in the bath, the print would sooner or later become entirely eliminated, which shows conclusively that it is an effective reducer. The best time to use it is while the print is still wet, though an over-printed carbon many years old will succumb to the treatment if allowed a little more time. We should advise the use of about one ounce of a saturated solution of lime in a pint of water to start with. Place the prints to be reduced in this bath and watch them carefully, noting how much they become reduced every now and then; and rinsing them frequently. When properly reduced, they should be washed well, and a very weak solution of citric or tartaric acid might be advantageously used to stop the action of the alkali and rid the paper of it. This hint will be of very great value to those who make carbons; especially beginners, whose tendency seems ever to be towards overprinting. Moreover, we may sometimes be mistaken in the depth we obtain on wet carbons, the water lends much transparency and they seem lighter than they really are. Since the lime water acts about as well on a dry print, we may, if we find we have mistaken the depth, treat the print to a slight reducing again if we fail to entirely clear the whites. This solution promises to be of great aid in saving what would otherwise have to go into the waste-basket, and so beautiful and valuable does any carbon appear to the maker that he hates to see so precious a thing consigned to a vulgar waste-basket with old "glossy types." The value of lime water for locally treating prints and lantern slides cannot be appreciated until tried. So much of the photography of to-day depends for much of its beauty on local touching up, adding a high light here and there, making a shadow more transparent, and other handwork, than to have such control over our carbons is a very great aid to the production of artistically perfect work, as well as a most economical idea for the saving of prints that would be of little value otherwise."

News and Notes.

THE Woodford Photographic Society's Annual Exhibition of members' work will take place at the Wilfrid Lawson Hall on Thursday, Friday, and Saturday, December 6, 7, and 8. Mr. E. N. Buxton has undertaken to perform the opening ceremony.

THE Redhill and District Camera Club's Second Annual Exhibition and Conversazione will be held on Friday, November 30, 1900, in the Large Assembly Room, Market Hall, Redhill. The judge will be Mr. Harold Baker. The classes are open to members only.

THE Thirteenth Annual Exhibition of the Southsea Amateur Photographic Society.—The gentlemen selected to judge the works in this exhibition, which is to be held on January 29, 30, and 31, 1901, are Messrs. Snowden Ward, H. Simonds, and W. West. All particulars of exhibition and entry forms may be obtained from the Hon. Secretary, Mr. Gilbert Wood, 10, Pelham-road, Southsea.

FROM Mr. W. F. Slater, of 5, Firs-parade, Lee, S.E., we have received a framed platinotype photograph representing the party forming the South London Photographic Society's excursion to Germany last August. There are fifty-four portraits in the group, which was printed by the Platinotype Company. A copy was sent to each member of the party. The picture forms a very pleasing memento of the excursion so admirably organised by Mr. Slater.

ROYAL INSTITUTION.—The Annual Course of Christmas Lectures, specially adapted to young people, at the Royal Institution, will be delivered by Sir Robert S. Ball, F.R.S., Lowndean Professor of Astronomy in the University of Cambridge, whose subject is "Great Chapters in the Book of Nature." The first lecture will take place on Thursday, December 27, at three o'clock, and the remaining lectures will be delivered on December 29, 1900, and on January 1, 3, 5, and 8, 1901.

SYSTEMATIC PHOTOGRAPHY.—The Company which has the contract for the great New York subway is making systematic use of the camera to put on record the various stages of their operations. Often when excavations are made property owners claim damages for the settling of buildings, &c. The contractors now make a complete set of views of every square, from various directions, before beginning work. If a building is "out of plumb" or cracked, the picture will show it, and damages cannot be secured later. The dated photographs also make a complete history of the job, and at small expense.

THE Biograph in Battle.—Our literature on the war would in no wise be complete without such a book. Naturally it has been written by Mr. Kennedy Laurie Dickson (says the "Daily Chronicle"), who took the biograph through ten months of campaigning. Mr. Dickson is of Scottish family, one of Edison's "young men," and now again settled on his own side of the Atlantic. He took eighty-two thousand war pictures while with Roberts, Buller, and the other generals in the field. He kept a diary of all he saw and heard, and so the book, which Mr. Fisher Unwin will publish, will have sketches by Mr. Dickson besides "biographs."

SOCIETY OF ARTS.—The Society of Arts will hold the opening meeting of its session, the 147th since the foundation of the Society in 1754, on Wednesday evening, November 21, when an address will be delivered by Sir John Evans, K.C.B., F.R.S., Vice-President and Chairman of the Council. For the meetings previous to Christmas the following arrangements have been made:—November 28, Major Ronald Ross, "Malaria and Mosquitoes"; December 5, Professor H. S. Hele-Shaw, LL.D., F.R.S., "Road Traction"; December 12, Professor Frank Clowes, D.Sc., "The Treatment of London Sewage"; December 19, W. T. Maud (Special Artist to the "Graphic"), "The Siege of Ladysmith."

AT South Norwood, on November 8, Mr. Sandell gave a demonstration of the use of the Cristoid roll films. The ease and certainty with which the films were developed in the Pyrocatechin developer much interested the members of the Society. Mr. Sandell showed that it was not necessary to take any particular care to avoid air bubbles or developing marks, since parts of the film which were not covered by the developer at first would catch up the other parts towards the end of the development. Neither was it necessary to keep the film flat during development. The film could be rolled up into a ball without any bad effect whatever. Large variations of exposure without interfering with the final result were also shown to be possible, and, generally speaking, it may be said to have been clearly shown that with the Cristoid films, in addition to giving very perfect negatives, were practically free from the many dangers attending development of some other types of roll films.

"OVER-EXPOSURE to Rontgen Rays."—Extraordinary statements were made at the opening of the inquest on the body of a widow, named Catherine Fanny Wilson, at Hastings, last week. Mrs. Wilson fractured the neck of the thigh in a bicycle accident in March. She was taken home, and on April 7 Rontgen rays were applied with a view to locating the injury. A second application was carried out on April 27, after which an eruption formed on deceased's stomach, near where the rays had been applied. Her niece called in another doctor on July 7, and a third physician later on. Death, however, took place on Monday last. The rays were applied the first time for two hours, and on the second occasion for two hours and ten minutes. A letter in deceased's handwriting, and marked, "Not to be opened until after my death," was found under the bed, in which she said: "The pain and anguish I suffer almost continuously from this painful sore is at times almost more than I can bear, caused by cruel over-exposure of Rontgen rays. If death does not speedily come I tremble to think of the consequences. I pray I may retain my reason." The niece, in her evidence, stated that deceased did not retain her reason. The letter was written about a month ago. The Coroner intimated that several experts would be called, and the inquiry was adjourned.

Commercial Intelligence.

MESSRS. LEVI, JONES & CO., of 29, Hoxton-square, Old-street, N., have sent us a fully illustrated price list of optical lanterns, slides, jets, regulators, screens, lenses, limes, &c.

MR. ALFRED WATKINS, who in future will trade as the Watkins Meter Company, specialists in photographic instruments, Imperial Mills, Hereford, writes under date October 30:—"I have this day purchased from Messrs. R. Field and Co., 142, Suffolk-street, Birmingham, their interest as licensees, their goodwill, and all book debts relating to the Watkins Exposure Meters and Eikrometers, and shall carry on the business at Hereford under the title of the Watkins Meter Company. The general policy adopted will be as hitherto—to work in sympathy with the trade. This transfer does not affect Messrs. Field's general business as opticians, which they continue."

RE Frank Edwards Brown, manufacturer of photographic apparatus, 36, Charlotte-road, Edgbaston, and 3, Exeter-street, Birmingham.—The

public examination of the above-named debtor took place at the Birmingham Bankruptcy Court, before Mr. Registrar Glaisyer, on Thursday last. The statement of affairs filed by the debtor disclosed liabilities amounting to £1503, and assets estimated to produce £198. The debtor, in reply to questions put by the Official Receiver, stated that until 1898 he was engaged with his grandfather, who was a manufacturer of photographic apparatus at 3, Exeter-street, Birmingham. His grandfather agreed to transfer the business to him, on condition that he paid his grandfather an annuity of £156, which after his death was to go to debtor's mother. No balance-sheet was prepared, but the premises were mortgaged to their full value, and the fixtures and available assets were not sufficient to pay the debts. He made an arrangement with his bankers to increase the overdraft from £1200 to £1500. He thought that with perseverance and attention to the business he could make it pay. He had sustained one loss of £500 in respect of some cameras which were constructed for a special film. He first found that his trade was failing off in March of the present year. The debtor was allowed to pass.

SEQUEL to an Unsuccessful Photographic Company.—Paul Boyer, Ltd., v. Edwardes.—The plaintiffs in this action, Messrs. Paul Boyer, Ltd., photographers, sued Mr. George Edwardes, the well-known theatrical proprietor, in the Queen's Bench Division of the High Court, before Mr. Justice Darling, sitting without a jury, to recover the sum of £200 and interest, which it was alleged was due from him as the holder of two hundred £1 shares in the Company. Mr. Herbert Reed, Q.C., in opening the case on behalf of the plaintiffs, stated that Paul Boyer was a Parisian photographer, and invented a new process for instantaneous photographs, which in 1898 excited considerable attention. In that year plaintiff came into contact with several gentlemen interested in art, and they agreed to underwrite a certain number of shares in a company which it was proposed to form to acquire the invention, and among those gentlemen was the defendant, who agreed to underwrite two hundred shares. On July 18, 1898, the defendant signed an underwriting letter to take that number of shares in a company, on condition that eight thousand shares (Preference) were irrevocably applied for by persons residing in France. Mr. Toti, a gentleman residing in France, underwrote £800 worth of Preference shares, and duly paid the application money, which amounted to £1000. At a subsequent meeting of the directors, in consequence of the public subscription being so small, it was determined not to allot any shares to the public. That being so, the underwriters became liable to take the whole of the shares they had underwritten. These shares were duly allotted to the persons put upon the register, including the defendant. Unfortunately, the plaintiffs' invention, for which so much was hoped, had not as yet produced very great results, and on May 3, 1899, the Company went into liquidation. On behalf of the defendant, it was contended that he never applied for the shares, and that he refused to subscribe, or accept them, on the ground that the condition relating to the £8000 worth of shares being applied for by the public in France had not been complied with. That condition had not been complied with; therefore it was submitted that the defendant was released from liability. The consideration Mr. Boyer was to receive was £4000 in cash, and counsel on behalf of the defendant suggested that one could readily conceive that Mr. Toti put forward his application for eight thousand shares for the express purpose of getting over the difficulty set out in the agreement, and thereby attempted to make the underwriters liable. Eventually His Lordship held that the plaintiff had not complied with the condition in the underwriting letter, and gave judgment for the defendant with costs.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
19.....	Camera Clnb	{ Some Simple Optical Curiosities. Rev. F. C. Lambert, M.A.
19.....	Doncaster	Exhibition of Members' Lantern Slides.
20.....	Birmingham Photo. Society ..	{ Special Demonstration by Mr. Smith, of the Platinotype Company.
20.....	Bootle	Demonstration: The Development of Cloud Negatives. W. T. Wright.
20.....	Croydon Microscopical	{ Buddhist, Jain, and Hindu Temples in India. W. Law Bros.
20.....	Gospel Oak	{ Demonstration: Thornton Films. Walter D. Welford, F.R.P.S.
21.....	Borough Polytechnic	Lantern Night.
21.....	Croydon Camera Club	The Thornton Film. Walter D. Welford.
21.....	Photographic Club	{ "Fred Walker," A.R.A., and his Work. J. P. Goodwin.
21.....	Redhill and District	The Camera as an Aid to Microscopical Research. F. Martin Duncan.
21.....	Woodford	Reversed Negatives and Positives Direct in the Camera by Persulphate of Ammonia. Mr. McIntosh.
22.....	Camera Clnb	Anthropology for Practical Men. E. W. Brabrook, C.B.
22.....	Hull	Hand Cameras. J. Hollingworth, M.R.C.S.
22.....	Leigh	Negatives and Prints, their Improvement and Modification. W. Ethelbert Henry, C.E.
22.....	Liverpool Amateur	Demonstration: Printing, Toning, and Manipulation of Solio P.O.P. William Harvey.
22.....	London and Provincial	Paper by Thomas E. Freshwater.
23.....	Aberdeen	Pictorial Composition. J. P. Fraser.
23.....	Borough Polytechnic	Instruction Evening: Lantern Slides by Contact and Reduction.
23.....	Croydon Microscopical	Lecture: Rejlander and his Work.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 13.—Ordinary Meeting.—Mr. T. R. Dallmeyer, F.R.A.S. (President) in the chair.

NEW MEMBERS, &c.

Twenty-four new members were elected, and twenty candidates for membership were nominated.

It was announced that the following Societies had been admitted to affiliation:—Arbroath Amateur Photographic Association, Carlisle and County Amateur Photographic Society, and the Preston Scientific Society (Photographic Section).

ECLIPSE PHOTOGRAPHY.

Mr. E. Walter Maunder read a paper entitled "Photography in the Eclipse of May 28, 1900." He referred, at the outset, to the paper which he read before the Society some eighteen months ago on the subject of "Exposures in Coronal Photography," in which he expressed the opinion that, given a total eclipse of the sun, the sky clear, the sun high, and all conditions favourable, any exposure from one-sixtieth of a second up to one-half second might be expected to give a valuable result with a lens aperture of f-15. In that communication he also stated that exposures of from one-sixtieth to one-fifth of a second were greatly needed, in order to bring out to the best effect the prominences and important details of the lower corona. He also alluded to the success of Mrs. Maunder's exposures in the 1898 eclipse, which being equivalent to 125 seconds, with f-15, had recorded the faint outer streamers of the corona to a much greater distance than it had previously been thought they could possibly be photographed. The conclusion to which he then came was that the exposures required were either much shorter or much longer than those which were commonly given. Mr. Maunder's views, embodied in the paper referred to, were received with general approval all over the world; the official instructions issued by the United States Naval Observatory for the eclipse of May last were avowedly based upon them, as were those of the Yerkes Observatory, and English astronomers in general had acted upon them, with the result that there had been a great increase in the proportion of beautiful and serviceable photographs of the inner corona. The lantern slides which Mr. Maunder proceeded to show, in illustration of the work done at the last eclipse, included reproductions of photographs taken by his own party in Algiers, by the British Astronomical Association in North Carolina, by the Astronomer Royal in Portugal, and by the Rev. J. Bacon, Professor Barnard, Professor Burckhalter, Mr. Nevil Maskelyne, Mr. Evershed, Professor Todd, and others. An interesting series of slides were those taken with Professor Burckhalter's apparatus for taking a perfect view of the whole of the corona in a single photograph, this device consisting of a fan revolving on a pivot running through the centre of the plate, and so graduated as to pass practically the whole of the rays from the outside of the corona whilst almost entirely cutting off those close to the sun. In no case, in the last eclipse, were the long streamers traced to anything like the same distance as in the eclipse of 1898, and Mr. Maunder thought this was due partly to the fact that the illumination of the sky was very much greater in Algiers than in India, and probably also to the fact that these extensions did not really reach the same distance in 1900 as they did in 1898. But although the long exposures did not succeed in rendering the extensions so far as on previous occasions, they were not thrown away; they were interesting from the fact that they brought out what Mr. Maunder at first thought was a new feature—namely, the dark rays in the corona which were shown in Mr. Ranyard's photographs of the eclipse of 1871. Reference was made to Mr. Shackleton's suggestion for photographing the corona, when the sun is uneclipsed, by using a sensitive plate of limited range as to colour, so as to confine its sensitiveness to the immediate neighbourhood of the coronium line, a suggestion which, in Mr. Maunder's opinion, would in course of time meet with much success, although it would not really be a solution of the problem of photographing the corona in full sunshine. Further slides explained Professor Todd's apparatus for securing a very large number of photographs. This instrument was controlled by a brass barrel with projecting studs, something like the barrel of a musical box, each stud working electric contacts which operated a large number of automatic cameras.

A brief discussion ensued, and, in reply to some of the questions raised, Mr. Maunder said that one or two observers of the late eclipse photographed the corona by polarised light, not for the purpose of securing an image of the corona, but in order to ascertain the amount of polarisation in it. He thought, however, that it might be worth while to adopt a suggestion made by the President, that an attempt should be made in the direction indicated. He and many other observers used some multiple-coated plates. They would no doubt be very advantageous for securing detail in the lower corona with a considerable amount of extension. A pinhole camera would not be suitable for work in an ordinary eclipse, as the corona was not sufficiently bright; but he had taken very successful pinhole photographs of the sun. With regard to a question whether ordinary cameras were of any service in an eclipse, Mr. Maunder said that although a large number of amateurs obtained photographs, the lenses employed were usually of too short focal length. With a lens of 9 inches focus the image of the sun was only one-twelfth of an inch diameter, and that was not much good. A professional photographer, who was not an astronomer, secured a fine series of photographs of the eclipse in India with an ordinary camera, but he removed the back combination of his lens, so that its focal length was about 32 inches. With a focal length of not less than 30 inches, an ordinary camera, rigidly fixed, would do very good work.

COMING EVENTS.

November 16 (to-night), the Traill Taylor Memorial Lecture, by Mr. F. E. Ives, on "The Optics of Trichromatic Photography"; November 27, Technical Meeting, "Analytic Portraiture," by Mr. Francis Galton.

PHOTOGRAPHIC CLUB.

NOVEMBER 7, 1900.—Annual General Meeting.—Mr. Frank Haes (Trustee) in the chair.

The notice convening the meeting having been read, the Hon. Sec. presented the 21st annual report and balance-sheet. A motion for the adoption of the report and balance-sheet having been proposed and seconded, the Chairman made a few references to the affairs of the Club, alluding to the fact that this was its 21st birthday. The report and balance-sheet were then adopted.

Messrs. H. E. Hull and Ward were appointed scrutineers of the ballot for officers and committee. The following is the result of the ballot:—Trustees: Mr. F. A. Bridge, Mr. Frank Haes. Committee: Mr. George E. Brown, Mr. E. W. Foxlee, Mr. J. W. Mason, Mr. W. R. Stretton, Mr. H. P. Smith, Mr. G. W. Tottem, Mr. H. Snowdon Ward, Mr. Charles Wallis. Recorder: Mr. A. W. W. Bartlett. Curator and Librarian: Mr. Hans Muller. Hon. Sec. and Treasurer: Mr. E. A. Newell.

Votes of thanks were passed to the Scrutineers, the Hon. Sec., the Trustees, the late Librarian, and the Lantern Committee for their services during the past year.

Liverpool Amateur Photographic Association.—November 10. Mr. Walter D. Welford demonstrated on the subject of films *versus* plates, with special reference to the new Thornton film. Mr. Welford laid special stress upon the fact that, as compared with plates, films had the advantage of being light, portable, unbreakable, and easy of storage, and with regard to the Thornton film, which is coated on a gelatine base, instead of the usual celluloid, there is no chance of the sensitive film deteriorating.

Hackney Photographic Society.—November 6, Mr. W. Rawlings presiding. Mr. Robins, of the Kodak Company, showed a number of the firm's cameras, one of the most interesting of which being the Panoram Kodak. Examples of work done by this showed it to be a very useful instrument for certain purposes, giving a very realistic representation of subjects broad in extent. A number of other forms of Kodak were also shown, all being noteworthy for the ingenuity of their construction, and for their compactness. Mr. Robins showed also a handy device for facilitating the cutting of exposed lengths of roll film. He then demonstrated the development of the latter. Several were developed together in a dish, using metol-hydroquinone as a developer. Particular points to remember in developing the roll film are that the film must be soaked in water before placing into developer, and after the final washing a bath of 2 per cent. glycerine must be used to prevent curling after drying. A discussion followed Mr. Robins' demonstration, in the course of which several members spoke highly of the quality of the Kodak film.

West London Photographic Society.—On the 9th inst. Mr. L. Selby read a paper on Silver Printing Processes, dealing more particularly with bromide printing. Whilst the ordinary smooth papers had their uses, he called special attention to the pictorial advantages of those which were coated upon a tinted paper, such as Eastman's Royal and Wellington's Cream Crayon. He spoke highly of the permanence of such papers, provided they were properly fixed, and recommended the bromide as the best printing process for amateurs who had not time and facilities for carbon or platinotype. Next meeting, "Ozotype," by G. F. Blackmore, on November 23.

Eastbourne Photographic Society.—At the last meeting of the Eastbourne Photographic Society Mr. E. J. Bedford was voted to the chair. Mr. W. E. Dunmore lectured on the "Tella" hand camera. He claimed that it was the smallest, lightest, and handiest camera in the world, when it was considered it had the capacity for carrying as many as forty or fifty films. The lecture concluded with a series of lantern slides; they included some very picturesque views in South Germany, and also a quantity of studies from Nature, taken at the London and Brussels Zoological Gardens.

FORTHCOMING EXHIBITIONS.

1900.

November 16, 17 Ashton-under-Lyne.

" 19-24 Waterloo and Blundellsands Photographic Society
Hon. Secretary, W. G. Eyre, 2, Mersey-road
Blundellsands.

" 21-23 Hackney Photographic Society. Hon. Secretary,
W. Selfe, 70, Paragon-road, Hackney, N.E.

" 21-24 Cleveland Camera Club. Hon. Secretary, F. W.
Pearson, 98, Victoria-road, Middlesborough.

" 22-24 Hove Camera Club. Hon. Secretary, C. Ber-
rington-Stoner, 24, Holland-road, Hove.

1901.

January 14-19 Blairgowrie and District Photographic Association.
The Hon. Secretaries, Blairgowrie, N.B.

Patent News.

THE following applications for Patents were made between October 29 and November 3, 1900:—

ACTINOMETERS.—No. 19,331. "Improvements in Photographic Actinometers." A. WATKINS.

NON-ACTINIC LAMPS.—No. 19,369. "An Improvement in Non-actinic or Monochromatic Lamps." J. W. NEWALL.

DEVELOPMENT OF FILMS.—No. 19,396. "Improvements in Apparatus for Developing Photographic Films." J. W. MEEK.
 DARK CHAMBERS.—No. 19,465. "Improvements in Photograph Dark Chambers." E. HOCHSTRASSER.
 ANTER-SLIDE CARRIERS.—No. 19,487. "An Improved Apparatus for Exposing and Covering Lantern Slides in the Magic Lantern." G. W. BROWN and G. R. BEAUMONT.
 FILM CARTRIDGES.—No. 19,694. "An Improvement in Photographic Cartidges." J. T. SANDELL.

Correspondence.

* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* We do not undertake responsibility for the opinions expressed by our correspondents.

ENAMELLED WARE.

To the Editors.

GENTLEMEN,—Can you use your influence to induce the manufacturers to give us, experimentally, still one more variety of the above, which, as now existing, sooner or later deteriorates from the iron oxidising through cracks of the enamel. My suggestion is to name dishes, &c., made of thin copper, which, while more costly, would, I think, for those who want the best, be worth the cost. I should like to know from somebody of experience if the idea is practicable.—I am yours, &c.,

J. WHITFIELD.

THE SITTERS' RECOMMENDATION.

To the Editors.

GENTLEMEN,—The article by A. Lockett in THE BRITISH JOURNAL OF PHOTOGRAPHY of October 5 is no more than a statement of facts known to most professionals. Still, it may serve to remind some of us of our shortcomings, as not a few inexplicably refuse to profit from their consciousness of forces militating against their prosperity. In my opinion, the whole of one issue of the JOURNAL might be filled with an account of the pitfalls that beset us. Here is a very peculiar one of my own experience, which probably has, with variations, been that of others of our craft. An amateur asked for loan of my dark room. I readily acquiesced. After a time he asked for the loan of my studio to photograph his wife! This I felt unable to do, not having arrived at the philanthropic stage of my career. A week or so ago I very nearly lost an order worth a fair amount, and, when I inquired what had I done to merit punishment, it was explained to me that the officer who had the disposal of the work (and who was, be it noted, a friend or acquaintance of the lady) had mentioned, in the hearing of my informant, that I was a dog-in-the-manger fellow who wouldn't let an amateur change his plates in my dark room. Now, if it is remembered that I never have yet refused to lend my dark room; that (damning fact) my informant mentioned the name of the lady's husband as the injured party, it must be sadly admitted that this lady (?) had deliberately lied with the express intention of doing me an injury, for she knew the work was of regular recurrence. I blame the woman, because I know the man, and he is a man. What are we to do to be saved?—I am, yours, &c.,

H. HANDS.

C. P., East India, October 24.

[We have no doubt that many of our professional readers could relate some interesting experiences of the cool impertinencies to which they are occasionally subjected by their amateur patrons. An instance occurs to us. One of the best-known photographers in Britain was, some time ago, taking a family group in his studio. The group needed a very considerable amount of arrangement—sufficient, indeed, to call for the exercise of very high skill by the photographer. When the exposure was made, one of the party (a gentleman who had with him a small hand camera) stepped out of the group, and asked to be allowed to photograph it before the arrangement was disturbed. Our friend's reply to this modest request was an offer of the loan of his studio on a future occasion.—EDS.]

A FIXING AND HARDENING BATH.

To the Editors.

GENTLEMEN,—The following formula has come under my notice as a fixing and hardening bath:—

(a) Alum	1 ounce.
Water	10 ounces.
(b) Sulphite of soda	2 ounces.
Hyposulphite of soda	6 ounces.
Water	10 ounces.
Add solution (a) to solution (b), when it is ready for use.	

I do not like combined baths of any kind, but not having been entirely satisfied with the separate solutions in this case, I mixed two pints in the proportions given. Result: a fine sample of rich cream.

I did not consider it ready for use in that condition, so I filtered out the precipitate, $2\frac{3}{4}$ ounces, when quite dry. I thought my alum at 7lbs. for a shilling might not be pure, so I bought some extra pure at the chemists, and with it mixed half the former amount—viz., two half-pints. Result: richer cream, $1\frac{1}{2}$ ounces of dry precipitate.

Having mixed the two clear solutions together, I proceeded to fix and harden two $\frac{1}{4}$ -plate negatives. Result: they both floated off the support beautifully as soon as they were put in the washing water. When washed I collected them on a piece of glass. Result: two fair negatives about 5×4 , which, when dry, stripped from the glass as nicely as a squeegeed print.

Taking small quantities of solutions (a) and (b), I poured (a) into (b), and (b) into (a), with and without agitation. The result was equally rich cream either way.

By this time I became rather interested, and curious to know what the chemical action was that had taken place, where a mixture was evidently intended. My chemistry is very rusty; I passed my examination thirty-five years ago, and have had no occasion to keep posted since.

I dug out my old chemistry books, looked up the symbols (modern notation) in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, used up several half-sheets of paper struggling with the reaction, but without definite result.

The fact that the bath had no hardening action, but retained its fixing power, indicated to me that the alum was destroyed, and the hyposulphite of soda was not.

The conclusion I came to was that the sulphite of soda, $\text{Na}_2 \text{SO}_3$, took from the alum, $\text{Al K} (\text{SO}_4)_2$, a portion of sulphur, and became hyposulphite of soda, $\text{Na}_2 \text{S}_2 \text{O}_3$, and that the precipitate was a double salt, an insoluble sulphate of alumina and sulphate of potass, much the same as that found in alum stone. I therefore heated some of the precipitate, with the result that an acid gas (probably sulphurous) was given off plentifully, turning damp litmus paper brilliantly red.

The original precipitate, when washed in water, made the water sufficiently acid to turn blue litmus paper pink. The roasted precipitate made the water sufficiently alkaline to turn the litmus paper blue again, but was very slightly soluble.

Possibly, if all the acid was driven off only protoxide of potassium (K_2O) and sesquioxide of aluminium, Al_2O_3 , would remain, and the K_2O , being soluble, would cause the alkaline action.

These blunderings of an inexpert chemist may be of little or no interest to you or the photographic public, but I think your expert corrections of the blunders would be of interest and value all round, especially to those who put forward such formulæ for the misguidance of the unlucky amateur who tries them.

You will find my name and address below, but should you publish my letter, I will sign myself

P.O.P.

[The addition of the alum solution to that of the hyposulphite of soda always throws down a considerable precipitate. The mixture should be allowed to stand for a day or so for the decomposition to be complete, and for the precipitate to subside. Then it is ready for use as "the acid fixing bath." Had it been prepared in this way, the film would not have left the glass.—EDS.]

CARBONA PAPER.

To the Editors.

GENTLEMEN,—Some time ago you were good enough to draw attention in your JOURNAL to a sentence in our booklet, "Artistic Photos with Carbone P.O.P.," which was of a somewhat sweeping nature. We omitted at the time to draw your attention to the fact that we immediately corrected the paragraph. Consequently we are sending you a copy of the booklet showing you that we have made the necessary alteration. The paragraph, as it stood previously, was unnecessarily severe, and did not express our ideas so truly as the altered sentence does.—We are, yours, &c.,

JOHN J. GRIFFIN & SONS, LTD.

[The passage to which Messrs. Griffin refer now reads as follows:—The "Compleat" Photographer will learn all the subtleties of the various printing processes—the Carbon, the Platinum, the Velox, the P.O.P., and will know how to adopt that which best suits the subject in hand. Of the P.O.P. class, "Carbone" should receive attention for these reasons: 1st. It prints-out quickly, and tones easily with rich effects. 2nd. It has two surfaces and qualities—matt, for effects of breadth and atmosphere; glossy, for detail and concentration. 3rd. The colour of the image is pigment-like, giving rich browns and deeper blacks, very much more pleasing from an artistic standpoint than the purple-blue and chocolate of the orthodox printing-out papers.—EDS.]

**THE THORNTON-PICKARD MANUFACTURING COMPANY
LIMITED.**

To the Editors.

GENTLEMEN.—The similarity between our name and that of a local film-manufacturing company is answerable for so much misunderstanding that we shall be glad if you will inform your readers that we are not, nor have we ever been, connected with the Thornton Film Company. Much confusion is caused by the fact that we are constantly receiving communications from customers who are under the erroneous impression that we make the films which have recently been placed on the market by this Company.

We are, yours, &c.,
THE THORNTON-PICKARD MANUFACTURING COMPANY, LTD.
Altringham, November 12, 1900.

PYRO STAINS.—GRAIN IN COPYING.

To the Editors.

GENTLEMEN.—Replying to "S. F." in last week's number, oxalic acid, or superoxalate of potash, will remove pyro stains from the hands. My plan is to damp my hands, put in the palm of one half a teaspoonful of the powdered acid, or salt, and rub well on the stains, afterwards rinsing off in plenty of water. It is desirable to use soft water, if obtainable, as, if there is any lime in the water, a disagreeable, slimy oxalate of lime will be formed on the hands.

Referring to a recent query as to avoiding the "grain" appearance in copies, I would remark that, where prints are made for copying, it is best to use matt P.O.P. to produce them on. Copies from prints on this paper show scarcely any more "grain" than if made by a transparency, as witness enclosed print [which is grainless].—Eds.]

I am, yours, &c.,

THOS. STOKOE.

Clare, Suffolk, November 12, 1900.

AMERICAN PHOTOGRAPHY AT RUSSELL-SQUARE.

To the Editors.

GENTLEMEN.—My letter has had the accustomed result when any discussion on deeper matters than usual is started: it has provided an opportunity for the disreputable person to expose himself.

"Tacoma" states that I wrote at Mr. Day's instigation. It should be superfluous for me to have to deny this, and to say that Mr. Day knew absolutely nothing of my letter till it was in your hands.

The only hope for "Tacoma" is that he seems enough ashamed of his accusation to have to hide it under the veil of anonymity; and should he be pleased to doubt my assertion, it will be as his nature demands, and on a par with his accusation.

I should not have written at all had your article been the mere criticism I think it should have been; but my sense of justice made me resent your unfair habit of quoting only the silliest things you could find written about Mr. Day, and ignoring whatever of good might have been said of his work, and even Hartmann has said some true and critical things. It was less my desire to approve or disapprove these sacred subjects as work for the camera (that is a matter every one must judge and decide for himself upon) than that I wished to place on record that one at least had the courage to disapprove of your journalistic methods, and I am greatly obliged to you for the printing thereof.

I am, yours, &c.,
November 12, 1900.

FREDERICK H. EVANS.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

W. B. Bruuskil, Sunbeams, Lake-road, Windermere.—Photograph of R. Rigg, Esq., M.P.

A. Miller, Barrhill-road, Old Cumnock, Ayrshire, N.B.—Photograph of Rev. Dr. Chrystal Auchinleck.

P. W. Morehen, 12, Shakespeare-road, New Brompton, Kent.—Two photographs entitled "The Handy Ladies."

J. Jackson, 79, Oxton-street, Walton, Liverpool.—Photograph of Miss M. Morrisson and Mr. J. Bergin. Photograph of Mr. J. Bergin.

EDDISON, LTD. (Liverpool).—The address of Messrs. Clement and Gilmer is 8 and 10, Rue de Malte, Paris.

IN JUDICE.—Messrs. Otto Konig and Co., of 27, Cross-street, Finsbury pavement, will supply you with baryta paper.

F. H. S.—A lamp for the purpose was put on the market some years ago by the Platinotype Company. We do not know if it is now obtainable. Better write the Company.

DETERIORATED SULPHITE OF SODA.—G. BRODEN. If the sulphite of soda is "crumbly and starchy-looking," and the pyro solution discolors directly it is poured on the plate, it is unfit for use; better throw it away, and procure fresh, as you will do no good with it.

ADDRESS WANTED.—W. H. R. writes: "Will you please give me the address of the firm that supplies the double salt of thiosulphate of soda?"—Every one who supplies photographic chemicals. It is generally known, by them, under the name of hyposulphite of soda.

F. G. (Boscombe).—1. The majority of the prints are produced either on albumenised paper or gelatino-chloride. The former process would be the more suitable for the purpose. 2. Surely letterpress printers are plentiful enough in your neighbourhood? You get such work done cheaper in the country than in London. Try Messrs. Mate, of Bournemouth.

FINISHING PHOTOGRAPHS.—A. C. writes: "Will you kindly give me a little information about finishing photographs—i.e., (1) what advantage (or otherwise) has a burnisher over a roller plate? (2) What firm makes a speciality of them?"—In reply: (1) Only that the burnisher gives a more highly polished surface, which some prefer. (2) Both rolling presses and burnishers are supplied by all photographic dealers. There are a great variety of each.

PRECIPITATED GOLD.—J. O'CONNOR. The phosphate bath refusing to tone is fully accounted for if the stock solution of chloride of gold has turned brown, and there is a sediment at the bottom of the bottle. The chloride of gold was either dissolved in impure water, or the solution was made in a dirty bottle, and so the gold has been precipitated to the metallic state, and in that form it is useless for toning.

THE BENEVOLENT ASSOCIATION.—A. F. THOMAS writes: "Can you inform me whether there are any funds available for grants in connection with the late 'Photographers' Benevolent Association,' and, if so, to whom application should be made? I know of no case of extreme need, where immediate assistance would be of the greatest service."—In reply: The fund in question is, we believe, exhausted. We cannot undertake to answer questions by post.

BOOKS ON PHOTOGRAPHY.—F. GOUGH writes: "Would it be troubling you too much if I were to ask you to tell me the best publications I can procure on photography generally? I want a book which embraces all parts of the work, and gives good illustrations."—In reply: No one book on photography will meet our correspondent's requirements; "photography generally" is a vague phrase. If he will let us know the branch or branches he is interested in, we will recommend him some books.

COLOURS ON VELOX PAPER.—W. M. writes: "I have been making some prints on velox paper, and I want to get a very warm colour, almost a red. Sometimes I get just what I want, and at others I do not, although I use precisely the same developer. Can you give a hint as to why?"—In reply: Yes; you do not give identically the same exposure in each case. The colour of the prints is entirely dependent upon the exposure, and identical tones are only to be obtained by identical exposures.

GAS BAGS.—"Oxon." writes: "It is very difficult for me here to get my oxygen in cylinders, and I think of making my own. I have the offer of a pair of gas bags for 30s., which, when new, cost four guineas. They have lain by for several years, and are very hard, but the owner says they are none the worse for that. Do you think it would be well to try them?"—In reply: We should say very doubtful, as very likely the rubber has perished. It is always very risky to buy old bags, particularly when they have been out of use for years.

THE ARC LIGHT FOR THE STUDIO.—ARTIFICIAL LIGHT writes: "Will you please tell me how many electric arc lamps it requires to light a studio for photographic purposes, and about the cost of same? What candle-power does it require for studio work?"—I reply:—Only one arc light is required. The candle-power usually employed for portraiture is from 6000 to 10,000. The price of the apparatus varies according to the power of the light. Write to Messrs. Gwynne and Co., Brook-street, Holborn, E.C. They will quote you prices for the requisite apparatus.

THE CITY AND GUILDS EXAMINATION.—PEGASUS asks: "(1) Is a knowledge of algebra and mathematics necessary in order to pass the Honours examination of the City and Guilds of London (photography)? (2) Where could I obtain some lists of questions set in former examinations? (3) What books would you advise me to study when working for this examination? (4) Is a knowledge of retouching necessary or helpful in the practical part of the examination?"—In reply: (1) Not necessary. (2, 3 and 4) For several years past we have printed the questions set at the examination. However, your simplest and cheapest way of getting full information on the subjects you specify is to procure a copy of the Handbook to the City and Guilds Examination. It is published by Messrs. Whittaker and Co., Paternoster-square, E.C., and it sets forth questions, lists of books, and all that an intending student requires to know.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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Information," and "Practical Notes and Suggestions of the Year," there will be found much useful matter, which, with the large collection of formulæ, tables, and other data for photographers, places at their disposal for daily reference a mass of information not to be found in any other photographic annual.

* * The 1898, 1899, and 1900 editions of the ALMANAC (20,500 copies) were each sold out within a few months of publication.

EX CATHEDRÂ.

SOME time ago we published an article (reprinted from "Nature") by Mr. Francis Galton, describing his process of what he called "Analytical Photography." Readers interested in the subject will find a very similar process, published in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900, described by F. H. Glew, under the title of "Differential Photography." It might be of interest to quote Mr. Glew's article here. It is as follows:—

"Minute comparison can be effected by the following little-known photographic method with speed and accuracy obtainable by no other means.

"Take a negative A, say of a landscape, from some particular corner of a window or other fixed spot, and at some later time, weeks or months, take with the same lens another negative B, from exactly the same point of view. Now, if a transparency is made from B, and this transparency is placed in contact with negative A, the most minute differences between the two views will be instantly apparent without any measurements, thus showing changes too small to be detected in any other way. In this way it is most interesting and instructive to study the growth, decay, and general effect of vegetation, structural alterations and defects; such comparisons often yield unexpected results of great interest. This method is specially useful in astronomical work."

Mr. Galton, it will be remembered, applied his similar process to the study of people's portraits.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

The Fortieth Annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published early in December. The total number of pages in the 1901 ALMANAC is 1,552, and the volume is the largest yet produced. The text portion of the book occupies about 500 pages. It will, as hitherto, be issued in paper covers, price 1s., or cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Morgan and Kidd, of Richmond, Surrey, from a negative by Mr. W. Crooke, of Princes-street, Edinburgh. A number of other illustrations will also be found in the text matter. Over eighty articles on practical subjects, contributed by well-known photographers, form a feature of the volume. The principal advances of the year are synopsised in the "Epitome of Progress During 1900," and in the other sections, "Patented Inventions of the Year," "Miscellaneous

ACTING upon a suggestion that was made in these pages a few months ago, the Committee of the London Photographic Club has decided to celebrate the interesting fact that this year the Club attains its majority. The Photographic Club was founded in 1879—a long time ago in photographic history, which commonly, if perhaps not quite accurately, dates its beginning from 1839, when Daguerre communicated his invention of the Daguerreotype to the Paris Academy of Sciences. The "majority celebration" of the Photographic Club will take the form of a dinner, to be held on Saturday, December 8, at Simpson's Restaurant, 76, Cheapside, under the presidency of Mr. F. A. Bridge. The Honorary Secretary of the Club, Mr. E. A. Newell, of 4, Maiden-lane, Queen-street, E.C., informs us that a large number of old members and friends have already signified their intention of being present, and he states that he will be pleased to hear from any others who may desire to be of the party on this interesting occasion. It goes without saying that a pleasant gathering will result. Ever since 1879 the pages of this JOURNAL have borne witness to the useful practical work which the Photographic Club has accomplished, and a list of those who have taken part in its proceedings would include the names of many who have had very prominent shares in the development of modern photography. Time, and the decentralisation of photographic interests and knowledge have not left untouched the unique position formerly held by the Photographic Club as one of the very few English societies that were in the forefront of "the movement"; but we are convinced that the possibilities of usefulness that lie before it are as great as ever they were. We hope that the celebration of the Club's majority will mark the starting-point of a new and vigorous stage in a career to which the word *finis* will never be written so long as photography itself exists.

* * *

THE remarks we have recently made with reference to German and American competition in optical production indirectly receive the most unqualified endorsement in an article published last week in "*Nature*," under the title of "*Instruments of Precision at the Paris Exhibition*." The writer, after eulogising the German optical and mechanical exhibits, quotes from a specially-prepared catalogue of the Exhibition the noteworthy information that in the last ten years the annual value of the instruments imported from Germany, including the optical glass used for lenses, rose from something over £200,000 to over £700,000. Comparing the French and German optical exhibits, he wrote, obviously before the close of the Exhibition: "Not that the sight is one which brings great pleasure to an Englishman, and if he moves on to examine the English exhibit his thoughts cannot fail to be very grave. There is nothing which can be compared with the German show; some well-known firms have won well-deserved prizes; there are some few interesting pieces of apparatus from South Kensington, and here and there in the electrical department one comes across a case of instruments. For the rest, the visitor will find, not collections of scientific apparatus, but small portions—attractive portions, it is true, in many cases—of the windows of well-known opticians' shops. As much apparatus as is possible is packed together in a small space, there is much repetition, there is no organisation, there is no

attempt to instruct the learner or to attract the man who comes with inquiries with a view to purchase; English mechanics and opticians have no unity of aim, and their art, with some few exceptions, is but loosely linked to pure science." Again, he contrasts American and German methods of supplying information to inquirers with those of the English exhibitor: "The German exhibit is under the skilled care of Dr. Robert Drosten, with some three or four scientific assistants. One or more of these gentlemen is always ready to give information about special instruments. When I visited the exhibition I asked for a catalogue, and inquired if I could examine more closely certain special instruments. By all means, was the reply, and Herr Drosten gave me several hours of his time opening cases, taking apparatus out, looking up special catalogues, and loading me with information. At the end of this time we were both tired, and he suggested that if I found, on looking over the catalogue and my notes, that I had omitted anything, I should come again. I returned next morning, and spent nearly as long a second time. So also with some American measuring and testing apparatus; the cases were opened, and I was allowed to handle the apparatus; one gentleman gave me a very full demonstration of the use of a new testing machine, which combines a multitude of ingenious devices. Contrast this with the English exhibit. A courteous commissionaire was, when I saw it, in charge of the whole; there were some notices as to where to apply for price lists of some of the firms exhibiting; the nearest approach to a catalogue was a set of cards hung on the wall relating to the excellent exhibit of the Scientific Instrument Company. These I found of real value, but they could not be carried away for reference." Much of what appears in the "*Nature*" article (the whole of which deserves to be studied) reads like an echo of what we wrote apropos of the English exhibits at Paris in the JOURNAL last July, and still more recently on October 26 and November 2. In face of the poor show made by Great Britain at Paris, who can be surprised that so eminently practicable a man of business as the Prince of Wales has expressed his disappointment with it?

* * *

THE Committee of the West Surrey Photographic Society—an active and well-managed body—is making a novel attempt to attract public attention to the Society's existence with the view of increasing its membership. "It is so difficult," writes Mr. J. T. Price, the President, "to get at the amateur in his native haunts that we thought the simple lure as herewith might perhaps secure him." We might add that, from the point of view of photographic society management, the professional is not less shy and disinclined to take his share in teaching others, or being taught. This by the way. The West Surrey's particular "lure," as Mr. Price happily calls it, is nothing less than a well-printed show-card containing information about the Society's meeting place, objects, subscriptions, Secretary's address, and so forth. In the centre it bears a very excellent photograph indeed, printed either in platinum or bromide, with an inscriptive line which sets forth that the photograph was taken by a member of the West Surrey Society. The idea is entirely good and well carried out. Judiciously hung in suitable positions in the neighbourhoods of Clapham, Wandsworth, and Battersea, which, to our personal

knowledge, simply teem with unattached photographers, this show-card and the attractive specimen of photography mounted upon it should largely increase the membership of the enterprising West Surrey Society, which also issues some very tastefully-prepared prospectuses, photographically illustrated, setting forth the advantages obtained by photographers who join that Society.

* * *

WE are within what the late Mr. Gladstone might have termed "measurable distance" of the close of the century, and this fact has moved a friend of ours to send us a few telescopic peeps at futurity. Zadkiel, he points out, has overlooked the photographic world in his surveys of the passing years, so our friend supplies the omission of the great prophet with regard to the next century. Here are a few extracts from Photo-Zadkiel's prophecies. The complete document would form piquant reading, but we prefer to date it, place it among our private archives, and leave it to posterity to apportion to our friend exactly the reputation for far-sightedness which time may show he has earned. "1. Pictorial photography will have passed away by the middle of the new century, and no one will even trouble to write its history. 2. Direct photographs in natural colours will be produced, and the monochrome print will become a curiosity. 3. Photographs will be taken without lenses. 4. Japanese cameras will be introduced and used for all kinds of work. 5. There will be three great classes of photographers, and only three—the scientific class, the trade class, and the toy class, chiefly schoolboys. 6. THE BRITISH JOURNAL OF PHOTOGRAPHY will be—." But our natural modesty bids us halt here, although we share our friend's confidence with regard to our future. We have not printed the most interesting of Photo-Zadkiel's prophecies; but Nos. 2, 3, 4, and 5 of those given above will probably turn out to be not very wide of the mark. As to Japan, at the present time she is quietly preparing to compete in the markets of photographic manufactures, and the world will not be very much older before Japanese dry plates and printing papers find their way to London.

REVERSED NEGATIVES IN PRACTICE.

THERE cannot be a divided opinion as to the increasing taste for photographs in other than the orthodox photographic colour. In all exhibitions we find reds, sepia, browns, blacks, and other colours in strong evidence. Also in professional portraitists' show-cases and reception rooms we see pictures in different colours, and on papers with different surfaces, made a speciality of, and this may be taken as a conclusive proof that this class of picture is appreciated by their clientele. Seeing this is the case, it becomes a question as to which is the best and simplest method of producing them? It goes without saying that both points are of importance, alike to professionals and amateurs, for it must be admitted that both, while desirous of obtaining the best results, like to obtain them with the least possible trouble.

For blacks and sepia the platinotype process fulfils all requirements, but with it we are confined to these two colours. With bromide papers and those of the Velox type, we have the means of obtaining a great variety of

colours, but they both require a modified method of development, with very accurate exposure to obtain them uniformly. With these papers a variety of colours may also be obtained by after toning with uranium or other agents, though perhaps with questionable stability of the pictures. Still, the methods are practicable enough. Now, although it is easy enough with these papers to produce a great variety of colours, it is not quite so easy to produce a number of prints all of the same colour—a given tint. Every professional knows quite well how difficult it is to supply a dozen cabinet portraits all of the same tint, say, in red chalk, for example, as selected by the sitter, unless he has a very careful and skilful printer; and, even then, there is often a number of "wasters." With amateurs the exact tint is not of so much importance, as with them often "variety is charming."

How, then, is the greatest variety of colour to be obtained with the greatest degree of certainty, and by the simplest means? There is but one answer to the question—the carbon process. With that any colour whatever may be obtained with the certainty that all the prints will be of a uniform colour, and, what is more, they may be obtained on any surface paper if the single transfer method be followed, for the double transfer is not well suited for rough papers, and it is more trouble in practice, as it involves an additional operation. The single transfer method, however, involves the production of a reversed negative, otherwise the picture will be reversed as regards right and left. It has been stated that this does not matter with portraits, but that is a mistake, as every portraitist is aware. Hence with the single transfer method, which is simplicity itself, a reversed negative becomes imperative, and that brings us to the point, How is that best or most easily produced?

There are many ways of producing reversed negatives. It may be done by reproducing the negative, say, by the powder process, by taking advantage of the reversing action of light, or by reproducing the negative through the agency of a transparency, &c. But all these methods are more or less troublesome, and require some considerable skill to obtain the best results; for this reason they have been but little practised by portraitists or by amateurs. Another method, which is most generally followed by those who make reversed negatives for the mechanical processes is to take the negative directly reversed by the aid of a prism, or reversing mirror. This method, however, does not commend itself to the portraitist or to the amateur. The latter, if he uses any of the rollable films—stripping or otherwise—has at once a negative which is both reversed or non-reversed, according to the side from which it is printed. But these films are, for the present, at least, not likely to find much favour with professional portraitists.

Reversed negatives are, however, easily obtained by stripping the film of an ordinary negative from the glass. This is looked upon by some as a difficult and risky operation, while it is nothing of the kind. It is simplicity itself. Premising that the negative has been alumed, or treated with formalin, to prevent the film from curling or expanding when stripped, what has to be done is this: Place it on a levelling stand and pour on some enamel collodion so that it is about the thirty-secondth of an inch thick. This by reason of its thickness will take an hour or

more, according to the temperature, to thoroughly set. When set it is placed in water to wash out all traces of the ether and alcohol. It will be found more economical, and save time, if some more pyroxyline be added to the collodion, as then a thinner coating will suffice, and it will take less time to set. After all the solvents of the collodion are washed away a penknife is run round the margin of the plate to cut through the films. It is then put into water, to which a few drops per ounce, of hydrofluoric acid have been added. In a short time the film will begin to detach itself from the glass, when it may be lifted off and placed on blotting-paper, or on a sheet of glass, to dry. We then have a negative just analogous to one taken on a rollable film, which can be printed from either side as desired.

A method which will probably commend itself better to the professional portraitist is that of exposing the plate in the camera with the glass side next the lens, of course making allowance for the thickness of the glass after the image has been focussed. This is not a difficult matter, seeing that the dry plates now supplied are, of a given batch, all of practically uniform thickness, a very different condition of things from what prevailed in the earlier days of gelatine photography. The glass is also practically free from air bubbles which would show in the picture. It need not be mentioned that the back of the glass must be cleaned from any emulsion that may be on its surface before the plate is put into the dark slide. But, with the perfection of modern coating machines, this is a very trivial matter.

There is no more difficulty in developing a negative taken through the glass than one taken in the usual way, if the first appearance of the image—which will be rather longer in showing itself—be watched for from the back instead of the front. Its density is, of course, judged of in the usual way. There are really advantages in portraiture in taking the negative through the glass. One is that halation from the back of the plate is avoided, which often shows strongly in portraits, as when there is, say, white lace on a velvet or black dress, for few portraitists back their plates to avoid it. Portraitists who make a speciality of pictures in different colours would often do well to take two negatives—one through the glass and the other in the usual way. Then either could be employed as occasion required—dry plates are cheap enough nowadays.

Although the latter remarks are intended more particularly for professionals, they apply also to amateurs. They, when they desire to produce prints in various colours, may also expose the plates through the glass, and thus secure reversed negatives without after trouble. They will then have negatives from which they can obtain prints of any desired colour or tint, with the certainty of getting them all alike, without the trouble of after toning, and of assured permanency of the results.

Cambrian Art in London.—An interesting Exhibition of Paintings was opened last week at the South London Art Gallery, Peckham-road, by the Mayoress of Camberwell. The Exhibition is interesting inasmuch as the pictures are all by the members of the Royal Cambrian Academy, and it forms an excellent representation of the work that has recently been produced in the Principality. There are some eighty oil paintings and nearly sixty water colours, also some in black and white. Hitherto Wales has not been very prominent in Art matters, though every valley has its bards and

musicians, and we all know of their qualities. Now that the Principality has its Royal Academy, like England and Scotland, we have little doubt that Wales will not long be behind in Art matters. The Exhibition will be open to the public from 2 p.m. to 10 p.m., and on Sundays from 3 till 9, until the end of February. Our readers will do well to pay this Exhibition a visit.

Constable's Pictures.—There has been on view for some days at Leighton House, in what used to be the studio of the late Lord Leighton, a very fine collection of mezzotints of Constable's paintings. Constable's works appeal specially to landscape photographers, for most of them are just the subjects that they delight in depicting. Furthermore, many of them are of places that are now the happy hunting grounds of photographers, and most of them are near home. For example, there are the Hampstead sandpits, Dedham Vale, bits of the Stour valley, Flatford Mill, several of the locks and weirs of the sleepy stream that marks the border between Suffolk and Essex, &c. It will be interesting to photographers to see how their well-known subjects were dealt with by this great master in landscape painting. Those who wish to see the collection must lose no time, as the brief exhibition, unfortunately, closes to-morrow.

The Missing Leonids.—A fortnight back we made reference to the fact that the great star shower, that is said by astronomers to occur only every thirty-three years, did not put in an appearance last year, and that it was expected they would this November; also that Dr. Downing, in a paper read before the British Astronomical Association, was not over-sanguine that they would, though it would be well to keep a good look out for them on the 13th, 14th, and 15th, and many, we know, did and had cameras ready. But the display did not show up, though the atmospheric conditions were not in most places unfavourable for photographing them if they did, and the light of the moon would not have interfered. We learn, by a Reuter telegram from New York, that at Minnesota over seventy meteors were noted during the night at the Goodale Observatory, and during the early morning a number of Leonids were observed, also a considerable shower was seen from the constellation of Gemini, which was quite unexpected. There were, it is mentioned, five distinct groups of showers. At Greenwich, however, though a sharp look-out was kept all the week, nothing more was seen beyond what is usual in November, when "shooting stars" are always expected. It would almost seem that the Leonids have deserted us, and, in the opinion of some astronomers, become a thing of the past.

Acetylene.—During the past few years acetylene as an illuminant has made considerable progress in this country, and it is more particularly in connexion with the lantern that it is, perhaps, best known amongst photographers. Although it has been advancing here, it has clearly not made the same progress in England as it has done in Germany. We see that Dr. F. Rose, the British Consul at Stuttgart, in his report on the trade, agriculture, and finances of Württemberg for the year 1899 and part of 1900, which forms one of the diplomatic and consular reports issued from the Foreign Office last week, makes special reference to the acetylene gas industry during the past five years. He says that in Europe alone 120,000 horse power is devoted to the manufacture of the calcium carbide, and the manufacture is increasing; also he claims that Germany was foremost in the field with its manufacture, and has secured an advantage which she has since easily maintained and considerably increased. Dr. Rose mentions that, up to July 1898, 62,000 jets of acetylene were installed; by the end of 1899 the number of jets had increased to 170,000, and at the present time it amounts to at least 200,000 jets, adding that it is at present impossible to predict the ultimate struggle between this new illuminant and its rivals; but he speculates that petroleum will suffer most, and coal gas next, particularly for the lighting of small towns. Dr. Rose further adds: "Not content with producing carbide in Germany, German capital has gone to foreign countries, notably to Norway and Switzerland, and carbide works have been erected which are managed by German engineers."

From this report it would seem that this country is a long way behind Germany in the calcium carbide and acetylene industry. But shall it remain so? If we had more water power at our command, we doubt if that would be the case.

The Alleged Death from Röntgen Rays.—In a paragraph last week the alleged death from the effects of the Röntgen rays was briefly reported. The allegation was made by the deceased, in a letter she wrote some month or more before she died, and it has been made, by some of the lay press, quite a sensational case of; so much so that, if the verdict of the jury on Saturday last did not dispel the ideas that the rays had anything to do with the cause of death, many persons would be induced to decline the application of Röntgen's discovery in cases even of urgency; just in the same way that some, in the case of an operation, dread the effect of chloroform as much as they do the operation itself. However, the evidence of several independent medical men and experts at the inquest showed that, although the long-continued action of the rays has a tendency to cause skin trouble, they have no further ill effect. It would have been interesting to know what coil and what tube were used to necessitate so long an exposure as thirty-five minutes for one plate and forty-five for the second—an hour and ten minutes for the two exposures; in subsequent radiographs it ran to forty-five minutes. The photographer who took the radiographs is reported to have said that with up-to-date apparatus he would have only given five minutes. As an expert the medical officer of the Electrical department at St. Bartholomew's Hospital was called, who stated, having regard to the instruments used and the part of the body photographed, he considered that there had been a proper exposure; but he added that the risk of an X-ray "burn" was always present in long exposure, and, in reply to a question, said that with up-to-date apparatus the usual exposure was seven or eight minutes. Now it is manifest that, seeing there is always a risk from X-ray "burns" with long exposures, the most improved apparatus should always be employed, so as to minimise the risk as much as possible. It is a well-established fact that it is only a prolonged exposure to the rays that results in trouble; therefore such apparatus should be used as will curtail the exposure to a minimum. It is not such a very costly matter nowadays.

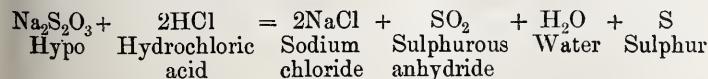
THE ACID AND OTHER FIXING BATHS.

THE addition of an acid to the ordinary fixing bath was first suggested by Eder,* we think for use with plates, the addition being made to obviate the intense yellow stain due to pyro and the fixed alkali developers; but the addition of any acid to hyposulphite produces a decomposition with an immediate slow deposition of sulphur which makes the bath cloudy. In 1889 Reeb suggested the use of acetic acid, and advised warming the bath and allowing it to settle, and then decanting or filtering from the deposited sulphur.

In 1889 Lainer† stated that, if an acid were added to a solution of sodium sulphite first and then added to the hypo solution, no deposition of sulphur took place. He also suggested the use of acid sulphite lye, which is a cheap commercial article in Germany, and is an extremely concentrated solution of acid sulphite of soda with free sulphurous acid, which is used in the dyeing and brewing trades.

The use of alum in the fixing bath was first suggested by De la Ferronay‡, its object being, of course, to prevent stripping and frilling of the gelatine film. In this case as in the former, the hyposulphite of soda is decomposed and the solution becomes milky.

The reactions which occur in both cases are somewhat complex, and were supposed to be capable of representation by the following equation in the case of acid :—

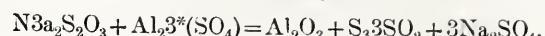


* "Handbuch der Photographie," 1885, p. 237, vol. iii., 3rd edition.

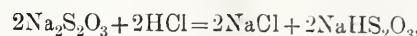
† "Photo Corresp." 1889, p. 171.

‡ "Photo News," 1883, p. 142.

and in the case of alum by the following :—



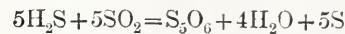
The most important contribution to our knowledge on the point of the action of acids and alums on thiosulphate of soda is that by Seyewitz & Chicandard. "Sur les réactions engendrées par la décomposition de l'hyposulfite de soude dans le fixage des images photographiques," † in which they point out that it is necessary to differentiate between the two cases, the one in which an acid is in excess, and the other in which the hypo is in excess. In the former case the above equations are practically correct, though it would be more correct to assume that the acid sets free hypo-sulphurous acid $\text{H}_2\text{S}_2\text{O}_3$, which decomposes into the other sulphurous products and water. When, on the other hand, the hypo is in excess it would be more correct to assume the formation of an acid hyposulphite of soda :—



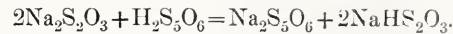
and that this acid hyposulphite then split up as follows :—



From this we get a secondary action between an equal quantity of the sulphuretted hydrogen and sulphurous anhydride through which pentathionic acid is formed :—



this acid reacts on the hyposulphite, giving hypo-sulphurous acid and pentathionate of soda :—



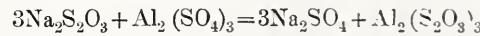
A further reaction occurs between the sulphuretted hydrogen and further hyposulphite of soda :—



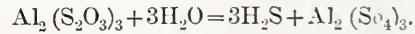
so that briefly we may say that the result of adding an acid to excess of hypo is the formation of (a) sulphurous acid, (b) sulphuretted hydrogen, (c) a sodium salt of the acid employed (d) sulphate of soda, (e) sulphur, and that the secondary actions are (a) sodium bisulphite, (b) pentathionate of soda, (c) acid sulphide of soda.

When alum is added to hypo the reactions are also somewhat complex, but one arrives at practically the same standpoint finally, and the steps as traced by the same experimenters are as follows :—

(a). Aluminium sulphate acts on the hypo giving sodium sulphate and aluminium hyposulphite :—



(b) the last salt is extremely unstable, and in the presence of water into aluminium sulphate and sulphuretted hydrogen :—



(c) the sulphuretted hydrogen decomposes slowly an excess of hypo and gives sodium bisulphite, acid sulphide, and sulphur :—



From these remarks it will be obvious that an acid or alum fixing bath is totally unfitted for use with printing-out papers, and may be a source of danger both for negatives and developed prints if formed by the simple addition of acid or alum to a solution of hypo, because not only of the danger of the sulphuration of the image, but of the deposition of sulphur itself in the gelatine.

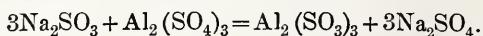
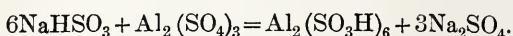
As we have already pointed out, Lainer stated that sodium sulphite prevented the deposition of sulphur, and Reeb ‡ also stated that sodium bisulphite would act in the same way. Sulphites and bisulphites not decompose hyposulphites, and Chicandard and Seyewitz, in their paper already quoted, point this out, and state that alum combines with the bisulphite or sulphite to form the corresponding

* It will be noted here that the simple formula of aluminium sulphate has been adopted, the true formula of all alums being $(\text{M}^{\text{III}})^2(\text{SO}_4)_3 \text{M}'_2 \text{SO}_4$, $2\text{H}_2\text{O}$. —EDS.

† "Bulletin de la Société Française de Photographie," 1895, p. 55.

‡ "Bulletin de la Société Française de Photographie," September, 1894.

aluminium salt and sodium sulphate, and that these have no action on hypo—



In the case of an acid it is obvious that bisulphite or acid sulphite of soda and the soda salt of the acid used are formed, and thus, though the bath is acid, there is no decomposition of the hypo. They also point out that it is by no means necessary that the whole of the aluminium sulphate should be converted into the bisulphite or sulphite, and that, when the proportion of alum to the hyposulphite is as 1 to 20, the weight of the bisulphite need only be one-fifth of the alum.

Lainer in his paper suggested the following formulæ:—

Solution of hypo (1:4)	1000 parts.
Acid sulphite lye	50-100 "

or failing lye, a mixture of organic acid, such as citric or tartaric, and sulphite of soda solution may be used:—

Solution sodium sulphite (1:4)	60 parts.
" tartaric acid (1:2)	20 "

a stronger bath may be obtained by using—

Solution of sodium sulphite (1:4)	70 parts.
" " citric acid (1:2)	40 "

For the alum bath he proposed:—

Saturated solution of alum	1000 parts.
" sulphite	300 "
Solution of hypo (1:4)	I250 "

Mercier * pointed out that the addition of an acetate prevented the deposition of sulphur when an organic acid was added to the fixing bath, and that the citrates and tartrates acted in precisely the same way, and that these additions further, prevented, the decomposition of the alum in an alum fixing bath when a plate was immersed in the same without washing after development, this procedure, as is well known, giving rise to a deposition of alumina, and when a caustic alkali is used some curious markings which look as though the film had, at those points where the alumina is precipitated, become partially liquefied. He further stated that an excess of citrate considerably softened the gelatine, and it was also advisable to add some chloride of sodium to prevent the decomposition of the silver hyposulphites and thus enable the bath to be kept longer, and finally suggested the following formula:—

Anhydrous sodium hyposulphite	100 parts.
Potassium metabisulphite	20 "
Sodium citrate	5 "
" chloride	20 "
Potash alum	20 "
Water	1000 "

Carbutt, the well-known dry-plate maker of the States, suggests in his instructions for use the following bath:—

Sulphuric acid	4 parts.
Sulphite of soda	60 "
Chrome alum	30 "
Hyposulphite of soda	480 "
Warm water	1920 "

For Velox paper the makers suggest:—

Hyposulphite	1000 parts.
Water	4000 "
Sodium sulphite	30 "
Acetic acid	180 "
Powdered alum	30 "
Water	330 "

From what has been said it will be obvious that the only correct method of making either an acid or alum fixing bath is to dissolve the

sulphite and add the acid or alum, and then add this to the hypo in solution. Organic acids such as citric, tartaric, and acetic, are preferable to the inorganic, such as sulphuric, &c., and personally we think it better to omit the alum altogether, and replace it with about five per cent. of formalin. Those who have never used an acid fixing bath will be surprised at the freedom from stains, &c., and the long time the bath keeps free from discolouration and deposit, and when properly made it is superior to the plain bath for both plates of all kinds and developed prints.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

[The Third Traill Taylor Memorial Lecture.]

I.

THE search for a direct method of pigmentary colour photography, such as was dreamed of by the fathers of photography and the world at large, appears to have been practically abandoned, every seeming clue to such an achievement having proved a delusion. Nevertheless, so much has been accomplished in the direction of practical colour photography by indirect methods, that the subject has become a very large and important one, and so specialised that it would be impossible to do justice to it in a single lecture, or even in a treatise of considerable size. I even doubt if any one man possesses such a full knowledge of both the science and history of this subject as would make him competent to treat it fully, and with absolute impartiality.

This is the more surprising in that every method which has achieved or promises to achieve a notable degree of practical success is based upon the same underlying idea of a composite trichromatic image.

The most that I can hope to do in this lecture is to give such a concise critical review of the history, and science, and mechanism, of these methods as may serve to disclose the conditions of success, and help to clear away some of the lumber of ignorance and misconception, which has stood and still stands in the way of general progress.

I have chosen to treat the subject historically, as well as practically, not only because the history of the subject is very interesting in itself, but because by no other means can correct methods be established so well as by critical comparison with incorrect methods, which to the mind of the layman may appear to have been reasoned out with equal logic, and to superficial observation with even greater definiteness.

It is my sincere wish to give full credit to the pioneers of these methods, but at the same time to clear from the path the stumbling-blocks of their errors and misconceptions; for I have observed that the very men who commence and carry forward a great work often leave it encumbered with rubbish which impedes further progress, and which must be cleared away by somebody before the defects can be corrected and the work carried on to perfection.

I have myself devoted many years to trying to clear away the rubbish, correct the mistakes, and supply missing material to bring this work to perfection, and I presume that I may accept the honour of being asked to prepare this lecture as a recognition of my efforts, and a justification for such a treatment of the subject as must have been expected from me, in the light of my past record as a writer upon this subject.

I purpose to begin with a concise statement of the principles of successful trichromatic photography, and to follow with an analysis of the various methods which have been proposed, showing the progress towards the recognition and attainment of the conditions of success, and at the same time the specific defects of each method and device; but, for greater clearness, I shall divide my subject into sections, treating first of the principles of the more important processes, then of the optical and mechanical inventions designed to facilitate their practice, and last of all of special developments of the idea, and the optical devices pertaining thereto.

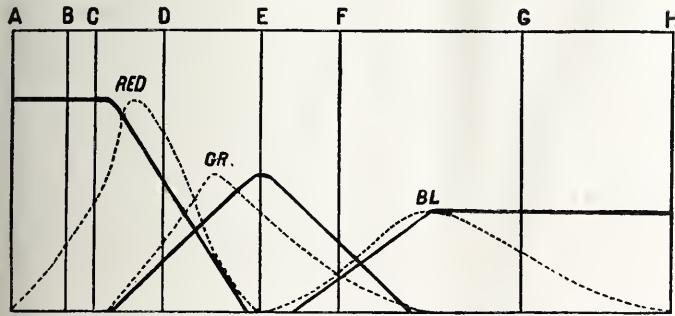
The trichromatic process of colour photography consists essentially in (1) the production of three photographic images which represent

* "Action des acétates et des citrates alcalins dans les fixateurs. Nouvelles formules de bains de fixage,"—"Bulletin de la Soc. Franç. de Phot., 1894, p. 356.

the physiological analysis of all colours into three simple spectrum colours, and constitute a colour record, and (2) synthesis by optical superposition of the three elements of the colour record in the three simple colours, whereby the sensations of all the original colours are reproduced to the eye.

Such analysis and synthesis is possible because there are three spectrum colours, which by admixture in suitable proportions will reproduce to the eye the sensation of every other spectrum colour. These three simple colours are the red of the spectrum, about the Fraunhofer line c, the green near b, and the blue near g.

What particular colours must be employed, and the proportions in which they must be mixed to reproduce to the eye the sensation of the intermediate spectrum hues, was first determined by Professor James Clerk-Maxwell, and is shown by his famous "colour curves," which I reproduce.



These factors have been redetermined by Sir William Abney, with an improvement upon Maxwell's colour box, but Maxwell's results are shown to be substantially correct, and I therefore prefer to use Maxwell's diagram in illustration, because of its historical bearing upon the subject.

Maxwell's curves are *colour-mixture* curves, and not to be confounded with *colour-sensation* curves, which assume a fundamental green sensation which no part of the spectrum excites exclusively. In trichromatic photography we have to deal with mixtures of actual spectrum colours.

The relative height of the respective curves at any point indicates the proportions of the simple colours required to reproduce to the eye the colour of the spectrum at that point.

It follows that in order to obtain a trichromatic colour record of the spectrum itself, three photographs of the spectrum must be made, in each of which the distribution of photographic action is such as would be represented graphically by the respective curve in Maxwell's diagram.

The picture to represent the red element in the analysis must be made not only by the action of the red rays, but by the action of orange-yellow and yellow-green rays, in proportion to the relative amount of red light required to represent the latter colours in the synthesis, by admixture of green; and, as shown by the "red" curve in Maxwell's diagram, the strongest action of all, instead of being in the red, will be in the orange, which is reproduced to the eye in its correct relative luminosity by mixing the greatest amount of red with a little green.

Similarly, the negative to represent the green element must be made by the joint action of orange, yellow, yellow-green, green and green-blue light, with the strongest action in the yellow-green, as shown by the second curve; and the third negative by the joint action of green-blue, blue and spectrum violet light, as shown by the third curve.

If the distribution of photographic action does not correspond to the form of these curves, the analysis will be imperfect, and correct synthesis becomes impossible. If the yellow of the spectrum does not act in both the red and green negatives, it must be reproduced either as red or as green; and if it acts in both negatives, but not in the correct relative proportions, it will be reproduced either as orange or as yellow-green. To ensure accurate results, the photographic analysis must be a *quantitative* analysis, and a correct quantitative analysis and no other will admit of the synthetical reproduction of the spectrum itself, with all its gradations of colour and luminosity.

All the colours in nature are mixtures of spectrum colours; therefore it may be taken as an axiom, that the ability or inability to reproduce the spectrum itself credits or discredits any trichromatic process.

If you can obtain by photography such a colour record of the spectrum as I have described, you can by the same means obtain true colour records in photographs from nature and works of art; but, if the spectrum test in any way fails, no real accuracy can be guaranteed or should be expected.

To secure negatives of the required character, we must employ colour-sensitive photographic plates, and filter the spectrum rays through suitable coloured mediums, testing by exposures in the photo-spectrograph and modifying the colour filters until the density curves conform to Maxwell's colour curves. Such adjusted colour filters I term "colour-curve screens." This system of photographic analysis I call "colour-curve analysis," and the photographic records "colour-curve records."

Although there are various methods of synthesis, positive (photochromoscopic) and negative (colour prints), the photographic record that is correct for one is correct for the other.

An incorrect colour record cannot be made to yield a correct synthesis by any means whatever.

Positive synthesis may be obtained by making a positive colour record (a transparency) from the negative colour record, and projecting the three images separately in three magic lanterns, each with light of the simple colour which it represents, and all superposed in register to form a single sharp composite image upon the screen.

Lest a most important point be missed, I repeat that the synthesis must be obtained with the simple colours, red, green, and blue, although the records have been made by the action of mixtures of various spectrum colours. Thus, although the record for red is made by the joint action of red, orange, yellow, and yellow-green light, this image must be pure red in the synthesis. Correct synthesis, therefore, demands the use of "pure colour" screens, in contradistinction to the "colour curve" screens pertaining to the process of analysis.

If we were to use the same screens for both analysis and synthesis, the results, in dealing with the spectrum, could not possibly be correct. The reason for this should be evident to any one who has followed my argument, but in a few words I will give one or two illustrations.

Suppose we make our colour records of the spectrum through "pure colour" screens; then only the two ends of the spectrum and a band in the middle will be reproduced, the remaining portions appearing as broad, dark spaces in the synthesis, because such screens transmit none of the intermediate spectrum rays. Suppose, on the other hand, that we attempt the synthesis with the "colour-curve" screens; the simple colours red, green, and blue, cannot be reproduced, because the respective screens transmit other spectrum colours along with these.

In short, it is absolutely necessary, in order to obtain a true colour record, to photograph through "colour-curve" screens, and correct synthesis is possible only with "pure colour" screens.

It is true it may happen that, in dealing with compound colours, the effects of departure from theoretically correct conditions will not always result so disastrously as in dealing with the spectrum itself; but no reliance can be placed upon any but fundamentally correct methods.

It is also true that the habit of the eye and mind, due to familiarity with monochromatic photographic reproductions, makes some dilution of colour acceptable to most people, but a recognition of the principle I have stated is necessary in order to introduce this dilution without change of hue. The dilution must be equivalent to admixture of white light only, and this is most perfectly effected by broadening the spectrum bands which are taken as synthesis colours without materially displacing them.

In positive synthesis we build up our composite colour photographic image by adding light to light, red, green, and blue, as already described; but we may also employ a method of negative synthesis, producing fixed colour prints upon paper or glass, in which case we commence with our white surface, and build up the picture by superposing coloured shadows (transparent colour prints) upon it.

This method is essentially complementary to the other, and the colours of the transparent prints are like the shadows of the corresponding positions in the white field of the triple lantern.

Red, green, and blue, being the colours in positive synthesis, *minus* red, *minus* green, and *minus* blue, or cyan blue, bright crimson, and yellow, are the printing colours.

If our white surface, against which these colour prints are superposed, were a white made by mixing red, green, and blue spectrum rays, no further definition of the printing colours would be necessary. Inasmuch, however, as our white is ordinarily made up of all the spectrum rays, it becomes necessary to consider the absorption of the colours in the intermediate spectrum regions.

The function of the printing colours is to most efficiently subtract from *ordinary* white light the visual impression belonging to the respective simple colour elements. In other words, the printing colours as seen in *ordinary* white light should appear to match as nearly as possible the *minus* (shadow) colours which may be produced in the physiologically white field of a device for positive synthesis.

This would not be accomplished by absorptions complementary to the correct photographic action, for the reason, for instance, that a *minus* red (c line) is considerably more antichromatic to the red element than a *minus* yellow (d line), although the yellow is more active than the red in the production of the respective negative, in accordance with Maxwell's curves.

I will give one practical illustration. The absorption of the dye cyanine is in approximate concordance with the Maxwell red curve, and, when it is used as a colour sensitiser on a suitable photographic plate, it yields a density curve also pretty close to the Maxwell red curve; but this colour, in ordinary daylight, is no more like our *minus* red than cobalt-blue glass is like signal green.

The relative efficiency of the absorption falls as we go towards the next "primary" in the spectrum, because it involves simultaneous damping of the visual impression of that other "primary."

It follows from this that the absorption of the printing colours should not conform to the Maxwell curves, but should be greatest for the "pure" colours, and fall gradually to the position of the next "primary" in the spectrum. Such absorptions are shown in the diagram given herewith, the Maxwell curves being shown by dotted lines, and the printing colour absorptions by the full lines.

degradation of colours, which, however, should disappear altogether if the prints are viewed in a mixture of pure red, green, and blue light.

In short, it is not possible, in ordinary white light, to reproduce all of the spectrum colours undiluted by means of any three printing colours, for the same reason that it cannot be done in positive synthesis by means of "colour curve" screens; but the best approximation may be obtained by using the printing colours most specifically antichromatic to the respective colour elements in ordinary white light.

Let me here emphasise the fact that the slight degradation of colour which the spectrum test will disclose even with such printing colours as I have indicated is in no material degree the fault of the photographic analysis, but is inherent in the printing colours. Analysis of the absorption curves of *any* three printing colours will demonstrate that by no means whatever can they be combined to reproduce the spectrum without some dilution or degradation, which may be either general and reduced to the lowest minimum, as with the colours I have indicated, or localised, so as to introduce changes of hue, which would be far more objectionable.

It is also necessary to point out that the comparatively short scale of correct gradation of the photographic process is always working against a tendency to weaken colour contrasts which might otherwise be expected, but also that, just in proportion as the colour contrasts are thus intensified, other, and I think more important, qualities are sacrificed. It is generally far better to sacrifice something of the purity of colours than to alter their hues.

Synthesis by the positive method offers the advantage not only of far greater simplicity, but of yielding every other quality along with practically undiminished purity of colour.

When I originally stated these propositions, they were dismissed by many as "mere assertions," "speculations, unsupported by argument or experimental proof," "pretentious and unfounded judgments," "theories, which have nothing to do with practice," &c.

It has always seemed to me that they were such logical deductions from the experimentally verified facts of spectrum colour analysis, that it would be an insult to intelligence to devote time and space to argument and illustration. I am of the same opinion still, but have nevertheless, tried to fortify myself this time with some arguments and illustrations, which I think go as far as should be necessary for anybody who can comprehend a simple theory.

It was by adhering to the conditions which I have laid down that I succeeded, at a time when the capabilities of trichromatic photography were almost universally discredited, in reproducing test subjects to the entire satisfaction of a committee of scientists appointed to investigate the subject.

I shall now proceed to consider the genesis of the various methods which have been proposed, showing as well as I can what elements of success were contributed by each worker, and wherein each failed, until all the conditions of success were realised.

The first suggestion was made by Prof. James Clerk-Maxwell, in a lecture at the Royal Institution, May 17, 1861. This lecture was never published in full, but a report of it was printed in the *Journal of the Royal Institution*.* According to this report, he

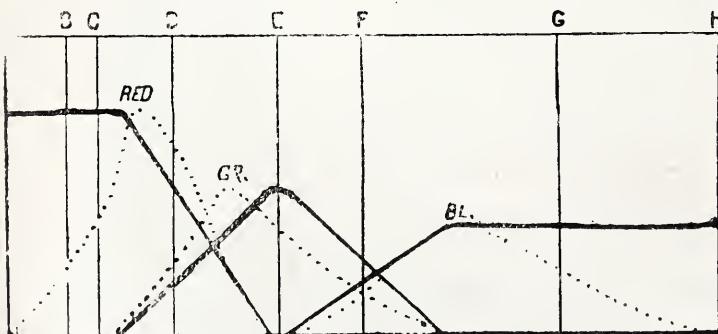
* "Experiments on the prismatic spectrum show that all the colours of the spectrum, and all the colours in nature, are equivalent to mixtures of three colours of the spectrum itself, namely, red, green (near the line E), and blue (near the line G).

"The speaker, assuming red, green, and blue as primary colours, then exhibited them on a screen by means of three magic lanterns, before which were three glass troughs containing respectively, sulphocyanide of iron, chloride of copper, and ammoniated copper.

"A triangle was thus illuminated, so that the pure colours appeared at its angles, while the rest of the triangle contained the various mixtures of the colours, as in Young's triangle of colour.

"The graduated intensity of the primary colours in different parts of the spectrum was exhibited by the coloured images, which, when superposed on the screen, gave an artificial representation of the spectrum.

"Three photographs of a coloured ribbon, taken through the three coloured solutions respectively, were introduced into the lantern, giving images representing the red, the green, and the blue parts separately, as they would be seen by Young's three sets of nerves separately. When these were superposed, a coloured image was seen which, if the red and green images had been as fully photographed as the blue, would have been a truly coloured image of the ribbon. By finding photographic materials more sensitive to the less refrangible rays, the representation of the colours of objects might be greatly improved."



These three absorptions, added together, make a neutral black or grey in ordinary white light, but absorptions according to the Maxwell curves would make a dark purple, because the "pure" red and violet spectrum rays would not be all absorbed. This drawing, although imperfect, sufficiently illustrates a principle which I have long recognised and tried to make clear to others.

I hope the illustrations which I have now given will make it sufficiently clear that in negative synthesis the printing colour absorptions should differ from the photographic analysis curves for the same reason that in positive synthesis it is necessary to employ "pure colour" screens instead of "colour curve" screens; but it is also evident that the distinction cannot be as complete, nor the result as perfect, because of the different character of the white light in the two cases.

As I have frequently pointed out, and as analysis of all the absorption diagrams will prove conclusively, synthesis by colour prints introduces a perceptible though not necessarily offensive dilution or

proposed the production of three photographs to represent the three fundamental colour sensations, by exposing photographic sensitive plates through colour filters, and synthesis by triple lantern projection through the same colour filters. I am inclined to believe that the principle of colour-curve analysis and pure colour synthesis was fully recognised by Clerk-Maxwell, and that it was only by an oversight that this distinction was not set forth in the brief report of his lecture. In short, I believe that his invention may have been theoretically complete for the recording of colours by photography, and their reproduction by triple lantern projection, but that it was lost to the world by insufficient publication.

The next published suggestion was made by Henry Collen, in a letter to THE BRITISH JOURNAL OF PHOTOGRAPHY (p. 547, Oct. 27, 1865). Collen, who accepted Brewster's theory of three primary colours of light, red, yellow, and blue, proposed the production of a separate negative by the action of each primary colour, and negative synthesis by the production and superposition of transparent colour prints. He suggested that the negatives should be made on thin pellicles, and that they should be superposed two and two to print transparent images of the third colour; thus, the negative made by blue light and the negative made by yellow light should be superposed and used as one in making the red print, the red and blue negatives for making a yellow print, and the red and yellow negatives for making a blue print.

There were three defects in this proposition, any one of which would have been fatal. First, the wrong idea as to primary colours. Second, the fact that prints in true red, yellow, and true blue cannot be made to even approximately reproduce all colours. Third, that the combination of two negatives doubles the opacity of all whites and greys, without altering the opacity in the records of the pure colours.

The result of this would be that when the printing was carried far enough to show details in the whites (opaque in two negatives), the pure colours (each opaque in only one negative), instead of printing like the whites, as they should, would print half way down to the deepest shadows in density, and reduce the relative luminosity of colours by nearly 50 per cent. in the finished prints.

In a trichromatic colour record, only one of the three colour elements can be represented in each negative image in its proper relation to the whites and greys.

Collen's idea was to make one complete negative image by superposing two single element records.

Baron Ransonnet, in Austria, is also credited with a crude suggestion of trichromatic photography, in 1865.

Louis Ducos Du Hauron, in France, applied for a patent on the trichromatic principle in November, 1868. Du Hauron elaborated the idea very much, suggesting not only triple negative colour records, positive synthesis by triple lantern projection, and negative synthesis by superposed colour prints, but also positive synthesis by a photochromoscopic apparatus, and a process in which a single screen made up of juxtaposed coloured lines was substituted for three separate colour screens, and the operation reduced to the production of a single photographic image.

Du Hauron displayed extraordinary ingenuity, but, like Collen, he was misled by Brewster's theory of colour, and there were fatal defects in every method which he proposed.

One of his mistakes was in the assumption that pure colour screens should be used in the photographic analysis intended for positive synthesis, and that the same screens should be used again in the synthesis. Another was that negatives of a totally different character would be required for the purpose of negative synthesis by superposed transparent colour prints.* He recognised that the opacities of each of the three negatives intended for positive synthesis should represent a single colour element only, but not that they should be made through "colour curve" screens, for synthesis with

"pure colour" screens. With respect to the character of negatives required for colour print synthesis, he made exactly the same theoretic mistake as Collen. He assumed that the opacities in each negative employed to make colour prints should represent two of the colour elements instead of one only; but, instead of superposing two single element negatives, he proposed to allow two colour elements to act together in producing each negative.* For instance, he would allow both the blue and the yellow to act in the production of the negative for making red prints. The principle is exactly the same as that enunciated by Collen, and has the same fatal defect. Du Hauron himself saw that two colour elements could not be fully represented in a single negative in their relation to the whites and greys, but declared that in practice the defect was not as great as would naturally be expected, and made an ingenious but wholly inadequate argument to explain away the difficulty.

No amount of argument can nullify a fact.

It has been asserted that Du Hauron's "binary" spectrum colours in reality correspond to the true "primaries," the descriptive term and not the colours themselves being erroneous. Writers who have made this assertion imply that I have misunderstood and misrepresented Du Hauron's work, but they are mistaken. Du Hauron not only plainly specified the "sifting of the rays of the two other colours," in contradistinction to exclusive sifting of the simple colours, but he distinctly said that *yellow and blue objects* must act alike (and as white) through the "green" screen, and while admitting that a cobalt blue glass is better than a "violet"† one for the blue-red negative, he adds that "there is here presented a physical fact not in accord with the theory."

This error of Collen and Du Hauron dies very hard, and is perpetuated with supreme assurance by new writers every little while.

One fact which must not be ignored is that, although Du Hauron's theory was that the printing colours should correspond to his idea of the primary spectrum colours, red, yellow, and blue, the colours which he actually recommended are not very far removed from the *minus* colours of the true "primaries." His blue (prussian blue) is a greenish blue; his red (carmine) is a crimson red; and his yellow is a *minus* blue. The fact is, that sheer experience led him to depart very considerably in the right direction from the requirements fixed by his theories; but his conclusion, most positively stated, that the photographs for positive synthesis should be made by "exclusive passage of the single colour corresponding," while the photographs for negative synthesis should be made by "rays of the two other colours," is proof positive that he utterly failed to grasp the true relation between the two kinds of synthesis—the *plus* and *minus* character of the synthesis colours themselves—which certainly demands *identical* colour records for both purposes, and also that they shall be "single element," "colour curve" records.

Du Hauron's most important new contribution to the development of trichromatic photography at this period was his suggestion of a photochromoscopic device, of which I shall speak in another part of my lecture.

This may seem scant treatment of Du Hauron's early exploitation of the principles of trichromatic photography, in view of the fact that many people have regarded his early writings as the fountain head of this science; but I must take the facts as I find them, and his more or less natural errors do not in any way detract from my admiration of his prophetic spirit, and ingenuity, and fertility of imagination, which should be an inspiration to everybody who can read his original treatise on trichromatic photography.

Du Hauron's first patent application was dated November 23, 1868, but his first printed publication appeared in *le Gers*, March 11, 13, 16, 18, 20, 23, and April 1 and 6, 1869, and shortly afterwards in pamphlet form. According to his brother, Alcide Ducos Du Hauron, he had communicated his ideas very fully, except in the matter of negative synthesis, in a *mémoire* transmitted to a French scientist

* "When the reader has read this book entirely through, he will recognise that, in the method described in Chapter IV., and which constitutes the direct method [for positive synthesis] . . . each of these images is obtained by the exclusive passage, or sifting of the rays of the simple colour corresponding, through a space of the same colour. Proceedings are not the same for the method of inversion" [for colour print synthesis].—From Louis Ducos Du Hauron's treatise of 1869.

† He describes "violet" as a colour containing a large proportion of red, showing that he means purple, which is called for by his theory.

and Member of the Institute, M. Lélut, July 14, 1862. It is a curious fact that this *mémoire*, said to have been intended for formal presentation to the Institute, but which was not published until 1897,* discloses several important ideas which are not to be found in any of Louis Ducos Du Hauron's writings which were published prior to 1897, and which had meanwhile been published or patented by others. I shall have occasion to refer to this *mémoire* again.

F. E. IVES.

OZOTYPE.

Mr. Thomas Manly gave a demonstration of his "Ozotype" process, at the usual weekly meeting of the Photographic Club on Nov. 14—a process of carbon printing in which the image is printed on any paper, and to which the pigment is applied afterwards in the shape of a modification of the ordinary tissue called a pigment plaster. Any paper of a good, pure character can be used. The image is a visible one contrary to the case with the carbon process. The carbon process requires that the pigmented tissue shall be sensitised in bichromate prior to printing. In the Ozotype process the pigment plaster is never sensitive to light; it may therefore be kept for any length of time, and there is no waste resulting from the gelatine becoming insoluble. Having selected a suitable paper, the operator proceeds to coat it with the sensitising solution supplied. This is done by means of a good flat hoghair brush, of about three inches width. Mr. Manly pinned down a piece of paper, 24 × 20 inches, a size in his opinion most convenient to coat. Two drachms of the sensitising solution are required for this area, and it is very important to be exact. The first few strokes of the brush may be heavy, getting lighter and lighter as the solution is distributed over the paper. The next stage is the drying of the paper. This should require about a quarter of an hour in a warm room. In a damp room the solution would be inclined to soak through the paper, and it is very essential that this should not be allowed. The dried paper may then be cut up and printed in the way usual with P.O.P., &c. When one can just see the detail of the high lights the paper may be removed and kept till the batch of prints is made, or placed direct into a dish of cold water. Washing is complete in a quarter of an hour under running water, or half an hour in frequent changes. Prints at this stage were passed round, having a very faint and weak appearance. One may now decide what colour the result is to be, and take of our stock of pigment plasters accordingly. We now require a bath containing a very weak solution of acetic acid and hydroquinone and a few grains of a metallic salt, the sulphate of copper or iron. There is a great difference in the actions of these salts in some cases, but in the Ozotype process they answer one purpose. The copper is more convenient to use. This bath, which consists of

Water	40 ounces.
Glacial acetic acid	60 minimis.
Hydroquinone	20 grains.
Sulphate of copper (10 per cent. solution)	1 drachm.

should be heated to about 75° to 80°. In the summer time it is not absolutely necessary, but at this time of year one must have the aid of a stove. In this bath the pigment plaster is soaked for a few minutes when it is ready to have the print placed face to face with it in the bath, withdrawn, and squeegeed on a zinc, vulcanite, or other support. Two hours after this is done the plaster is ready to be developed. In that time an action has gone on between the print and the plaster whereby the latter has been rendered variably insoluble, according to the lights and shades of the picture. Development is effected in hot water; the print takes to itself nearly all the pigmented gelatine from the plaster, when the two papers are stripped, and the soluble gelatine is then removed in the ordinary way by agitating the print in the tank or by dashing the water over it with a mug. From the fact that the original print takes up the pigment, it will be seen that no transfer is required to preserve the rights and lefts of the picture.

The best negative is one entirely free from fog or veil, as with the carbon process, but considerable variation may be made in the acetic acid bath to meet particular cases. The larger the proportion of acetic acid and the smaller that of the reducing agent, the harder will be the picture. On the other hand, more reducing agent and less acetic acid renders the picture softer. Of the phenol-derived reducing agents hydroquinone is the best for the Ozotype process.

Rough or smooth papers may be used. Rough papers, however, require sizing either before or after sensitising in order to make the pigment plaster adhere properly. Glycerine is a very useful agent. It softens the paper and assists the gelatine to secure a grip of the paper. A solution of equal parts of glycerine and water is helpful in ridding one of the chances of air bells, if the prints be dipped therein before

* "La Triplete Photographique des Couleurs et l'imprimerie." Alcide Ducos Du Hauron, Paris, 1897, p. 450.

squeegeing, and better contact is obtained. It is well to wipe the surface of the pigment plaster before use to rid it of specks and dust. A size for application after sensitising, drying, and printing the paper is made up of the following :

Fish glue	2 drachms.
Glycerine	1 ounce.
Water	6 ounces.

An insoluble sizing must be employed if the paper is to be sized before sensitising. The prepared paper must, of course, be dried in the dark.

Before mounting, the prints have to be treated with alum solution. Mr. Manly mounted his prints wet, after dipping in the alum bath and washing in two or three changes of water.

If the backing of the pigment plaster refuses at times to come away from the gelatine, it may be due to under-washing of the print—the free bichromate rendering the gelatine insoluble. The remedy is obvious. White specks are caused by imprisoned air-bells. These air-bells only cause spots, not blisters. The speed of the paper is about that of platinum paper.

The demonstration was attentively followed, and a hearty vote of thanks was given to Mr. Manly.

PHOTOGRAPHERS, THE PUBLIC, AND THE ILLUSTRATED PRESS.

The contributor who writes under the nom-de-plume of "Free Lance" commented on some notes I wrote dealing with the subject of "Copyright Portraits," and, with the Editors' permission, I would like to traverse his statements—although not in any captious spirit—because the matter is, I think, of some interest to photographers generally.

"Free Lance" wrote: "It is not the photographers who make the arrangements for publishing their royal photographs in one journal; it is the proprietors of the journal who make the arrangements, and photographers merely act as their hired agents; they receive, therefore, a weekly retaining fee! So much for what journalism does to benefit photographers in general." I do not think it is very material whether it is the photographer or the proprietors of the paper who make the arrangements. As a matter of fact, in many cases, it is the editor—the proprietors may not be consulted—and in some cases it is quite conceivable that it may be the photographers who make the suggestion; but the point was that there are people who do not think photographs of Royalty, more especially of Her Majesty, should be exploited for the benefit of one particular paper. In the particular instance I had in my mind, I doubt whether the photographer receives a weekly retaining fee; but of that I cannot say for certain.

"Free Lance" also said: "A lot of money has been made, and will be made, by copyright fees from the illustrateds. He is, however, a lucky man who often gets more than a five-pound note for such (and they are trying to establish a maximum of five shillings!). But what have they lost by it for themselves and their brother professionals? Hundreds of thousands of pounds of replicas. And who have gained, except the producers of those wretched, feeble caricatures of photography which are published to the utter degradation of illustrated journalism from the proud and high position it once occupied of artistic eminence and exploiters of the very best examples of the now almost extinct British art—wood engraving." I am aware that this is not the first time that "Free Lance" has given expression to similar opinions. His remarks are certainly not very complimentary to those who supply the photographs including those well-known firms who photograph Royalty and distinguished personages, to which I referred in my article. Many of us can fully appreciate the wood-cuts of such artists as William Nicholson, who, by the way, clever artist as he is, can appreciate good portrait photographs, and who has never, I feel sure, said anything so sweeping about the Press reproductions of photographs, as "Free Lance" has done. If we cannot prevent the force of circumstances, why shed vainless tears?

As to the loss in replicas these producers of "wretched, feeble caricatures of photography" have suffered, I am not aware that there is any compulsion about the matter. If it is not to the advantage of these photographers to allow their work to be reproduced in the illustrated press, why, then, have they not an obvious remedy? The photographers of the class of subject to which I referred are not very numerous, and as they are business men I presume they do not allow their photographs to be published in the illustrated press unless it pays them to do so; they do not pose as philanthropists.

"Free Lance" says the days of 80,000 orders for "Royal, or any other photographs, are gone for ever." "The illustrated papers have done that for us." But, as I have remarked, I am not aware that there is any compulsion in the matter.

The exploiting of photographs of members of the Royal family for purely commercial purposes is to some minds an anomaly, and to a great extent a monopoly, against which a good deal might be said.

Speaking generally, I agree that it is a moot point whether professional photographers benefit by allowing their work to be reproduced

in the illustrated Press. Certainly it seems more likely that the public would purchase an original photograph if it were not reproduced, i.e., assuming they knew the photograph had been taken. At the same time, I think it will be generally agreed that editors should pay reasonable and remunerative reproduction fees. Some day, perhaps, the Copyright Union will induce all the editors of illustrated papers to agree to their conditions and not to publish any photographs without paying the Union's minimum fees. This would be the simplest plan, if it could be effected. At present, the papers to which it is worth any one's while to send photographs are not very numerous. For one thing, there are so many photographers who are willing to accept any fee for a photograph that is published. When editors can obtain the use of amateurs' photographs for nothing, or next to nothing, it is not likely that they will pay professional photographers bigger fees for the same class of subject. In the case of photographs of Royalty and of distinguished personages, however, the supply is much less limited, and in this field "amateurs" and photographers generally have not much scope. Consequently the fees are not cut. It is curious that well-known amateur pictorial photographers allow their best pictures to be published in very rapidly printed and not over well produced papers, necessitating a complete disfigurement frequently of the original and a loss of all tone values to get an impression.

Money can be made by contributing photographs to the illustrated press; but I am not one of those who think it likely to prove a little El Dorado to the average professional; and, to some extent, such work is really in the province of the journalist.

J. A. REID.

AINTRÉE PHOTOGRAPHIC EXHIBITION AWARDS.

THIS exhibition had a most successful run all last week, and the judges, Messrs. R. Talbot Kelly, R.B.A., Paul Lange, and G. Watmough Webster, F.C.S., with Mr. Frederick Anyon in the Lecturette class, were so highly pleased with the splendid work sent in that they awarded no less than fourteen extra medals and diplomas, over and above the thirty-six which the Executive had provided for. The best picture was "Golden Harvest," an enlargement in carbon, and was awarded a gold medal, the competitor being Mr. T. E. Corney Wilson, of Liverpool.

Lecturette Class.

Silver, Algernon Brooker, Hastings.

Bronze, G. S. Bryson, Pollokshields.

Diploma, Wm. A. Taylor, Liverpool.

Landscape or Seascapes.

Silver, C. E. Walmsley, Ambleside; C. M. Wane, Edinburgh.

Bronze, Wm. A. Taylor, Liverpool; T. B. Sutton, Babington; Dr.

Llew. Morgan, Liverpool; H. Burkinshaw, Belper.

Diplomas, William E. Inston, Liverpool; J. R. Clarke, Whitehaven; W. P. Baker, St. Helens.

Architecture.

Silver, A. B. Gregory, Liverpool.

Bronze, A. J. Loughton, Southwell.

Diplomas, E. L. Brown, Edinburgh; Sparham Camp, Sheffield.

Enlargements.

Gold, T. E. Corney Wilson, Liverpool.

Bronze, Dr. C. F. Grindrod, Malvern; Dr. Llew. Morgan, Liverpool.

Diploma, T. A. Sands, Birmingham; Charles F. Inston, Liverpool; L. Henry, Liverpool.

Figure Studies.—Amateur.

Silver, Miss Evelyn Boden, Derby.

Bronze, J. A. McMichael, Chester; James Walker, Birkenhead.

Diplomas, Mrs. McIntyre, Aintree; Dr. Llew. Morgan, Liverpool; D. G. Monair, Blairgowrie.

Figure Studies.—Professional.

Silver, Gravestone Bird, Bath.

Bronze, C. M. Wane, Edinburgh.

Diploma, R. Yerburgh, Edinburgh.

Hand Camera Work.

Silver, William E. Inston, Liverpool.

Bronze, Thomas Hartley, Waterloo; E. R. Collins, Dulwich; S. R.

Midgley, Stonycroft.

Lantern Studies.

Silver, Edgar R. Bull, London.

Bronze, Algernon Brooker, Hastings.

Diploma, Graystone Bird, Bath.

South African Class.—Withheld. Insufficient competitors.

GOTZ'S NEW FILM HOLDER FOR DARK SLIDES.

[Patent No. 24,689 of 1899.]

THE invention relates to a method of holding the sensitive material, the latter being pressed back on to a solid support on which it rests for exposure, and the plane of the focus being laid not against a rebate,

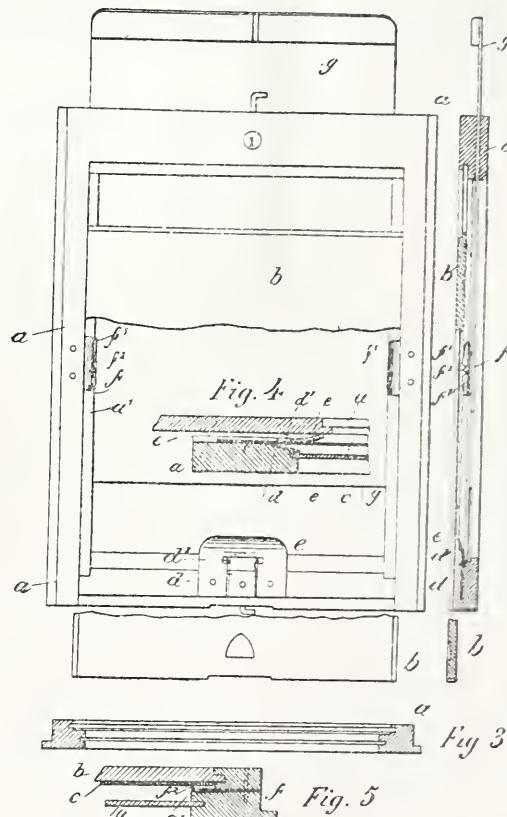
but just in front of the said solid support, allowing for the thickness of the material carrying the sensitive surface.

By this means the use of a carrier is avoided, and the sensitive film is held in the slide, without any such device as a stretcher or frame, or whatever the special carrier may be called.

Fig. 1 is a back view, Fig. 2 a longitudinal section, and Fig. 3 a cross section of a single dark slide embodying the invention. Fig. 4 shows a clip or gripping device, and Fig. 5 a holding-down spring on a larger scale. *a* represents the body or frame of the dark slide, *b* the sliding support or drawer, which Figs. 1 and 2 show partly drawn out and broken off, in order to show the parts situated behind it.

If a film or sheet *c* of paper, celluloid, or similar material, were inserted into the slide without any other support, the drawer or sliding

Fig. 1



door *b* would, in the act of closing, carry the film with it, and thus displace it from its required position.

Mr. Gotz adds: I therefore insert into the frame *a* of the slide a gripper *d* having two or more small teeth *d*¹, and over that a plate *e* acting as a spring, so that, when the sliding door *b* is closed, the plate *e* presses the film *c* on to the teeth *d*¹ of the gripper plate *d* and holds it in the proper position, as indicated by Fig. 4.

The sensitive film *c* is inserted with its front edge into the gripper, which, as soon as the drawer or sliding door *b* is being closed, holds the film firmly in its right place.

In order to keep the sides of the film in contact with the rigid sliding door, springs are used, which may be of various descriptions, their object being in all cases to hold the film down on to the rigid drawer; that is to say, in a direction opposite to that of the springs usually applied in dark slides.

These springs are inserted into the rebates *a*¹ and body *a* of the slide, one or more being placed on each side of the same.

I prefer to use a pair of metallic springs, *f*, *f* inserted into the body *a* of the slide and coming out flush with the rebate *a*¹, which is cut away to make room for the spring, as shown in detail by Fig. 5. Each of the springs *f* has a turned-over edge *f*¹ with one or more teeth *f*² to hold the sensitive film on to the rigid surface of the sliding door *b*.

THE GRENIER ART COMPANY'S PROCESS OF COLOURING PHOTOGRAPHS.

[Patent No. 13,317 of 1900.]

THE portrait or other picture or design is photographed on the silk or other material, preferably by methods employing any well-known suitable sensitising emulsions or solutions that are free from gelatine or albumen. After printing it on silk the picture is fixed by means of a hyposulphite bath and thoroughly washed so as to free the fibres of the silk from all traces of the hyposulphite. Then take a solution of

alum, using preferably one part of alum to sixteen parts of water by weight, and while the silk is still wet lay it with the back or unprinted surface downwards on the surface of the alum solution, without letting the alum solution flow on to or over the printed face of the silk. In ten or fifteen seconds the picture is taken out of the solution, allowed to drip, and then dried. As a result of this the fabric is impregnated with the alum. The evaporation of the water leaves the impregnating alum in the fabric. The fabric so prepared is ready to receive colours, which are applied by brush, as desired, using water colours. Permanent colours are the best colours to use, but aniline colours give very beautiful effects, especially for pictures of flowers. Alum solution may also be added to the colours before they are applied. The alum prevents the colours from running or blurring while drying, it renders them more intense and more durable, and it makes them practically waterproof, though this does not mean that the photographs will withstand violent rubbing or abuse while wet. The picture after being so coloured may be additionally protected by coating it with celluloid or other protecting and transparent material.

In applying the process to heavy fabrics, such as tapestry, the alum bath may be allowed to completely cover both the printed and unprinted surface of the fabric.

Our Editorial Table.

CATALOGUE RECEIVED.

Messrs. Perken, Son, & Co., Limited, 99, Hatton-garden. E.C.

THE neatly-produced catalogue of the well-known "Optimus" house, which has just been issued, numbers about a hundred pages, and the illustrated descriptions of the firm's specialities in apparatus, lanterns, and accessories are lacking neither in fulness nor variety. Lenses of the narrow angle, wide angle, portrait and rapid landscape type are given first place; then follow hand camera and cinematograph objectives. Next come hand and stand cameras, complete sets, shutters, stands, levels, focussing glasses, dark room lamps, washers and the hundred and one requirements of the practical amateur or professional photographer. About forty pages of the catalogue are devoted to the lantern department, and the book concludes with a lengthy alphabetical list of lantern slides.

The productions of Messrs. Perken, Son, and Co. need no recommendation at our hands, but, as many of them have recently come under our observation, we may take the present opportunity of congratulating the firm upon the unvarying excellence of the apparatus which leaves the Hatton Garden establishment. Especially is this so in respect of the Optimus lenses and cameras. The former have long been noted for very high optical qualities; while as for the cameras, be they *ære* of the cheaper or more expensive kinds, they are always well and carefully constructed. Quite recently we inspected a magnificent direct enlarging and reducing camera, 36 x 20, specially built, which is one of the finest bits of photographic cabinet work that we have seen. The esteemed firm of Perken, Son, and Co., modernised in name, of course, will soon have been in existence for half a century. It retains its vitality undiminished, and amongst British photographic apparatus manufacturing houses is assured of a position of the greatest prominence and esteem.

FLAME, ELECTRICITY, AND THE CAMERA.

By George Iles, 338 pp., 94 illustrations and 22 plates, price 7s. 6d. London: Published by Grant Richards, Henrietta-street, Covent Garden.

MR. ILES has made his book very good reading matter, for he has clothed his ideas in the florid language of the newspaper "leader" writer. He gives in a popular form an account of the principal modern achievements of physical, chemical, and mechanical science in the service of man, and writes throughout so enthusiastically about his subject that he conveys the impression that he lives in a veritable heaven of optimism. His main object "is to show how profoundly recent accessions to knowledge are transforming the foundations of social, political, and economic life, while at the same time they are correcting and broadening the deepest convictions of the human soul!" But, alas; and alas! Mr. Iles, with all that the century's science has done, the workhouses, prisons, and the lunatic asylums have no lack of occupants—"grim visaged war" stalks abroad in the three continents of Asia, Africa, and America; and want, misery, and crime do not seem to diminish! But we may allow Mr. Iles the indulgence in his beautiful optimism as a reward for the excellent work he has put into his book. His illustrations are instructive and well chosen. The hundred pages devoted to photography are not by any means free from errors of names, dates, and facts; but, like the remainder of the book, the section forms very good reading, and may induce many into whose hands the book will fall to take up a closer and more detailed study of photography. We can recommend "Flame, Electricity, and the Camera" as a gift-book suitable for general reading, or to place into the hands of a youth with scientific tastes. If hardly to be regarded as a textual authority, it should stimulate inquiry and promote a taste for popular science. The volume is beautifully printed and bound.

THE BOOK OF FAIR DEVON. 209 pp. Many illustrations. Price 2s.
Published by Iliffe, Sons & Sturmy, 3, St. Bride-street, E.C.

ISSUED under the direction of the United Devon Association, 17, Bedford-circus, Exeter, of which an old photographic friend, Mr. Chas. R. Rowe,

M.J.I., is Secretary, this tastefully-produced book should be assured of succeeding in the object that has led to its publication. It is, in fine, a capital advertisement of one of the several English counties that dispute for supremacy in respect of natural beauty and historical interest. There are about 30 half-tone reproductions from photographs printed in the text, which is further broken up by scores of clever sketches. In setting forth the attractions of Fair Devon to the invalid, the tourist, and the holiday-maker, the co-operation of many specialist writers on sport and other subjects has been secured, and we note as a point of some interest that Mr. Rowe himself is responsible for the article on "Golf." A world of care has been expended in the compilation of the work, which supplies a great deal of pleasant and useful reading, even to unfortunates like ourselves, who have not yet set foot in the Fair County. But, apart from its value and interest as a specimen of bookmaking, the volume before us appears to be so complete and conscientious that its wide distribution, especially in America, should surely be followed by the invasion next year of a large number of tourists and others. "The Book of Fair Devon" is neatly bound in green cloth, is clearly printed, and, as well for its main purpose, deserves even as a volume of reference to find a place on the book shelves of all lovers of that "dear homeland," in the crown of which Fair Devon is admittedly one of the brightest gems.

Studio Gossip.

THE Colonial Secretary has added amateur photography to his other accomplishments, and has been taking snapshots of Italian scenery. He is the only photographer in the Cabinet.

AN "Objectionable" Poster.—Considerable excitement was caused in Manchester last week by a rumour to the effect that a theatrical poster, placarded on an advertisement hoarding in the city in connection with a production of "Hearts are Trumps," at the Theatre Royal, had been obliterated by order of Mr. Peacock, the Chief Constable. The poster, which was issued by a London company, represented a kissing scene, with a photographer in the background. It appears, however, that the rumour was incorrect in one particular. Some time last week the Chief Constable received several complaints by letter about the poster, the writers regarding it as highly objectionable. The correspondents remarked that the general effect was such that many respectable fathers and mothers would be thankful if the picture were not allowed to remain on the walls and hoardings. Mr. Peacock thereupon wrote to Mr. Courneidge, the manager of the Theatre Royal, and communicated to him the general effect of the letters, without, however, giving any orders as to the removal of the poster, which, as a matter of fact, it was beyond his power to do. Mr. Courneidge, in reply, affirmed that he had no desire to publish any advertisement which might be deemed offensive, and that as complaints had been made the pictorial poster should be obliterated. He explained that, although he saw the posters beforehand, it was not for him to choose which should be given, and which withheld, as the Drury-lane Theatre Company brought out the piece, and sent ahead all the illustrated advertisements, and they might have objected to his interference.

JOURNALISTIC Changes in America.—From "Wilson's Photographic Magazine" we take the following announcement: "The 'Photographic Times' has our congratulations on the return of Mr. W. E. Woodbury to the editorial chair, which he vacated more than a year ago, to join the Nepera Chemical Co. During Mr. Woodbury's absence our contemporary was of somewhat fluctuating value, though for the last few months it has regained much lost ground under the able control of Mr. Juan C. Abel. Owing to ill-health, due partly to overwork, Mr. Abel has felt compelled to resign his position, and will, we understand, after a brief holiday for rest and recuperation, be interested in another phase of work. Mr. Woodbury contemplates some innovations in the magazine, which will be altogether on the lines of improvement." "The Photo-Era" also announces its absorption of the "American Journal of Photography" of Philadelphia, of the past career of which it supplies the following details: The Journal was first published in its present form by Thos. H. McCollin, of Philadelphia, in 1886, under the editorship of John Bartlett. Previous to this, photographic journals were almost unknown in this country [America]. It was devoted exclusively to professional interests, or in the interests of some progressive concerns, and its timely articles on current topics excited praise and admiration both here and abroad. Such leading men as Dr. Emerson and H. P. Robinson of our neighbours beyond the sea were attracted by its new departure, and their laudatory letters did much to establish its reputation. Illness forced Mr. Bartlett to retire from the editorial chair in 1890, and the work continued under direction of Mr. Sachse. Again in 1897 Mr. Bartlett resumed his work, changing the scope of the magazine and subordinating the scientific to the purely artistic element. In 1899 Mr. McCollin disposed of the magazine, and Mr. Austin C. Leeds became the owner, until the present arrangements were concluded."

A LADY Astronomer.—For the first time in the history of science, the President of the Royal Society has a wife almost equally gifted and famous in the special science for which the distinction is bestowed upon the President. If it were possible to appoint a lady President, Lady Huggins has every qualification for the post. And it is not a case in which the wife has simply shared the labours of a distinguished husband-lady, commenced the study of astro-physics and gained some renwn by and adapted herself to her environment. Lady Huggins, who is a Dubliner, her writings quite independently. When but a girl she would sally forth

at night with a lantern and star atlas, and with the aid of her father's telescope study the position of the astral bodies. Astro-physics she studied by means of a sixpenny prism, picked with critical care from a basket of odds and ends in a second-hand shop. With this simple apparatus, she had the satisfaction of repeating in a humble way the first experiments of Newton and Fraunhofer, and especially the epoch-making one of Kirchoff. After her marriage with Sir William Huggins, then Doctor Huggins, she continued her studies in conjunction with her husband, and with the splendid equipment provided for them at their Tulse Hill residence by the Royal Society. The result of their labours has been to entirely open up and popularise the science of astro-physics, and will rank as one of the great scientific achievements of the reign. Their house at Tulse Hill is one of the most interesting houses in London, full of gems of art and scientific curiosities—in fact, a very Pandora box of surprises. The garden, too, of which Lady Huggins is justly proud, is quite unlike any other garden one ever sees. Her aim has been to make a "natural" garden. There is nothing artificial in its arrangement; everything seems to have grown up spontaneously, and to be the result of Nature's own handiwork.

News and Notes.

ROYAL Photographic Society, Technical Meeting, Tuesday, November 27, at 66, Russell-square, at 8 p.m., "Analytical Portraiture," by Francis Galton, F.R.S.

BURNLEY Camera Club.—The Judges for the Burnley Camera Club's Exhibition, on January 18 and 19, are Messrs. C. Barrow Keene, F.R.P.S., Derby; Alex. Keighley, F.R.P.S., Keighley; and Dr. Llewellyn Morgan, M.R.P.S., Liverpool.

THE Royal Meteorological Society have established a memorial to the late Mr. G. J. Symons, F.R.S., the distinguished meteorologist and founder of the British Rainfall Organisation, in the form of a gold medal, to be awarded from time to time by the Council of the Royal Meteorological Society, for distinguished work in connection with meteorological science. The committee have decided to keep the list of donors open until the end of January, 1901.

MR. J. T. Ashby, of the Woodford Society, gave a lecture on "Pictorial Competition" before the North Middlesex Photographic Society on November 12. He entered a little into the rules of perspective, and then gave hints as to the selection of subject and the proper use of figures as an adjunct to the landscape. He gave no hard and fast rules, saying they were better avoided. He also showed a selection of slides by the best workers in his Society, the slides being of very good quality.

THERAPEUTICAL Treatment with Light.—The "Elektroteknisk Tidskrift" of Copenhagen states that a Danish electrical engineer has invented an electrical lamp which will cause a considerable advance in the therapeutic treatment with light followed by the Danish Professor Finsen. The lamp has been tested at "Finsen's Hospital for Treatment with Light," in Copenhagen, and has been proved to produce in an especial degree those chemical rays which are necessary for the purpose.

ACETYLENE to the Rescue.—Owing to the recent disastrous floods having submerged the coal gas works of Calcutta, the "Pioneer Acetylene Gas Company of India" were suddenly called upon to light Howrah Railway Station, the largest in India. Five of the Thorn and Hoddle Acetylene Gas Company's generators were at once fixed, and the whole installation was at work within three days. The Coal Gas Company wrote heartily thanking the Acetylene Gas Company for coming so promptly to the rescue.

THE Edinburgh Photographic Society's Annual Exhibition of Photographs will be held in the rooms of the Society, 38, Castle-street, Edinburgh, from Saturday, February 16, to Saturday, March 9, 1901. Entries close on Wednesday, February 6, 1901, at 4 p.m. Reception of pictures closes on Saturday, February 9, 1901, at 10 p.m. The following classes are open to all—(Gold, silver, and bronze medals in each class): Class 1, Portraiture and Figure Studies; Class 2, Landscape and Seascapes. All communications should be addressed to the Secretary, Mr. J. S. McCulloch, W.S., at 10a, George-street, Edinburgh.

PHOTOGRAPHIC Exhibition at Grantham.—In connection with the Grantham Industrial and Fine Art Exhibition, to be held on January 16, 17, and 18, 1901, and which will be opened by Her Grace the Duchess of Marlborough, there will be a photographic section open to amateurs in the United Kingdom. The following are the classes: Landscapes, Seascapes, and interiors, in sets not exceeding six pictures; portrait and animal studies, in sets not exceeding six pictures. Each picture judged separately. We learn that last year the photographs were a great feature of the Exhibition. The general manager is Mr. George Jackson, Laundry-terrace, Grantham.

X RAYS in Operations.—Before the Hastings Coroner, last week, the inquiry was concluded into the circumstances attending the death of Catherine Fanny Wilson, a widow, aged 68. Evidence had been given that X rays were used to locate a supposed fracture of the thigh, the result of a bicycle accident, and that shortly after an eruption broke out on the stomach. A letter had been written by deceased in which she alleged "cruel over-exposure of the X rays." For five weeks before death she was not of sound mind. Dr. H. Roberts, who was called in when the eruption occurred, said that death was due to exhaustion from effects of shock, evidently resulting from the fracture of the thigh and

application of the Rontgen rays. The photographer, Mr. Blomfield, stated he gave exposures of 35 and 45 minutes each. Dr. Lewis Jones, medical officer in charge of the electrical department of St. Bartholomew's Hospital, London, said he considered proper exposures had been made. Some persons were sensitive to X rays, and some were not. It was not known why this was so, but it was believed to be due to the state of the skin at various times. Some risk from X ray burn was always present in long exposures. Witness had never heard of a case in which an X ray burn had caused death.—The jury returned the following verdict: "That deceased met her death from shock and exhaustion following an accident and the effects of the X rays on a weakened system. No blame attaches to either the medical man or the photographer."

Commercial & Legal Intelligence.

MESSRS. Thom and Wiggins have commenced business as photographic material dealers at 15 and 16, Giltspur-street, London, E.C.

PATENTS in the Late Orange Free State.—The Comptroller-General of H.M. Patent Office is informed by the legal adviser of the Military Governor that the patent laws of the late Orange Free State have been in no way altered or disturbed, and that persons interested in obtaining letters patent or renewing patent rights already granted should proceed as they would have done had no war taken place. All applications, specifications, &c., may be drawn up in the English language. The Patent Office, which has been of necessity temporarily closed, will be reopened as soon as circumstances permit.

THE following is the list of the awards in the Austin-Edwards Lantern Slide and Film Negative Competitions for the current month:—£3 cash prize: Rev. E. T. Clark, Gloucester, "A Devonshire Lane"; £2 cash prize: H. Holt, West Kirby, "Vicarage Passage, Evesham"; £1 cash prize: J. Smith, Liverpool, "Atmosphere, River Derwent"; £1 cash prize: J. Walker, Birkenhead, "After a Storm"; £1 cash prize: Miss E. M. Barrows, Edgbaston, Birmingham, "An Old Yorkshire Cobbler"; £1 cash prize: E. R. Bull, Forest Hill, "In the Baronial Hall, Haddon Hall"; £1 cash prize: H. C. Leat, Bristol, "Entrance, Little Cloisters, Gloucester." Film Negative Competition.—The Frena Camera given each month for the best negative on an Austin-Edwards film has been secured by J. H. Bridgford, of Christchurch, Hants, for his negatives, "Street Scenes."

ALLEGED Breach of Contract.—At the Clerkenwell County Court, on Thursday last, before his Honour Judge Edge, Walter D. Welford, of 166, Romford-road, Stratford, photographic dealer, sued Walter Charles Grubb, trading as The Camera Construction Company at 38, Eagle-street, Holborn, to recover the sum of £15, damages for breach of contract.—Mr. Warren, who appeared for the plaintiff, called evidence to prove that his client had to go to Leeds to get an order executed in consequence of the failure of the defendant to complete the order for photographic goods within the time specified.—Mr. Grosser, on behalf of the defendant, said he would have been willing to execute the order from the plaintiff if he had received the cheque at the end of the month, but the plaintiff did not send it.—After considerable legal argument, his Honour said he would reserve his decision, as the point raised was an important one to the commercial community.

AT Bow-street Police Court, on the 19th inst., John Thompson, alias A. T. Homes, was charged, on remand, with being in the Royal Photographic Society's house, 66, Russell-square, W.C., on the evening of the 13th inst., with the intention of committing a felony. It appeared from the evidence of Mr. A. W. W. Bartlett, Assistant Secretary, that the prisoner had been present at a meeting of the Society in the winter of 1898, and, having been recognised as having been present at a previous meeting when an overcoat was found to have been stolen from the cloak-room, was asked by Mr. Bartlett, in the presence of some of the members, for the name of the member introducing him. He gave the name of Mr. Chancellor, of Dublin. Mr. Chancellor, on being applied to, denied all knowledge of the man. The prisoner on this occasion signed the attendance book J. Thompson, with an address in Gower-street, which was afterwards found to be an empty house. On the evening of the 13th inst., on the occasion of Mr. Maunder's lecture, Mr. Bartlett again noticed the presence of the prisoner, and, knowing that since 1898 he had served a sentence of imprisonment for stealing coats, ordered that he should be detained. It was found that he had signed the attendance book as a member under the name of A. T. Holmes, and he was given into custody. It was proved that the prisoner had been convicted of stealing overcoats, and had undergone sentences of four months and eighteen months' hard labour. He had also been charged recently with the unlawful possession of a lady's fur cloak, but there was not sufficient evidence to convict.—The magistrate sentenced the prisoner to twelve months' hard labour.

THE Britannia Works Company, Ltd.—The Directors' Report for the year ended October 31, 1900, to be presented at the Fourth Ordinary General Meeting to be held at Winchester House, Old Broad-street, E.C., on Wednesday, November 28, 1900, states that after payment of working expenses, directors' fees, income tax, &c., and making provision for doubtful debts, the net profit for the year's trading is £53,278 12s. 5d. This amount, with £3,552 19s. 5d., brought forward from last year, gives £56,831 18s. 10d. for appropriation. The directors have paid an interim dividend on the ordinary share capital for the half-year ended April 30, 1900, at the rate of 8 per cent. per annum, free of income tax,

absorbing £7,600; and for the same period they have paid the dividend on the Six per cent. Preference shares, amounting to £5,700. Since then the second dividend on the Six per Cent. Preference shares has been paid. From the balance the directors recommend that a dividend be paid on the Ordinary Share capital for the half-year ended October 31, 1900, at the rate of 12 per cent. per annum, free of income tax, making with the above interim dividend, 10 per cent. for the year. This will absorb £11,400. On this dividend, by the terms of the profit-sharing scheme, £766 11s. 3d. will be paid as bonus to the employees. Of the balance, £25,665 7s. 7d., the directors recommend that £15,000 be written off goodwill, processes, &c., and that £8,000 be placed to reserve, and the balance, £2,665 7s. 7d., carried forward. The business continues to show satisfactory progress, and, notwithstanding the wars in South Africa and China, which have seriously affected the Company's trade in those countries, the sales have been considerably larger than last year. The title of the Company being altogether unidentified with the Company's productions, which are known throughout the world as "Ilford" goods, the directors propose to change the name to "Ilford, Limited."

The Strong Man's Photo.—De Saurin v. Rosenstein. The plaintiff in this action, Alfred De Saurin, sued Maurice Rosenstein at the Liverpool County Court, before his Honour Judge Collier, to recover possession of a photo, or its value, £3. The plaintiff was described in a local music-hall as "The Herculean Marvel—The Monarch of all Iron-Jawed Men." The posters also set forth that, having met and defeated all the so-called champions of America, he has just returned to the scenes of his former triumphs, and had no equals, but was the undisputed champion, the consequence being that his engagement was "a most important and expensive one." The plaintiff's case was that in March last he lent his photo to one Barnett, a barber in Brownlow-hill. It was hung up to advertise "The Marvel," and the customers saw it and admired it. Barnett gave up his shop, and was succeeded by the defendant, Rosenstein, who allowed the photo to remain an ornament of his tonsorial saloon. From time to time "The Marvel" looked in to get his hair cut or shave, and last, but not least, to admire his photo. After a time he grew dissatisfied with the manner in which the defendant exhibited it, cobwebs began to gather on the photo, which was almost life-size, the gilt frame became tarnished, and there were not so many customers as there were formerly, and "The Marvel" came to the conclusion that as an advertisement his photo was of little value in the defendant's saloon, therefore he asked to be allowed to remove it. Certainly, replied the barber. "The Marvel" thereupon unhooked it, and was walking out of the shop with it, like Samson with the gates of Gaza, when the barber stopped him, and said he must have a receipt. "The Marvel" then wrote the following marvellous receipt, "Received my photo, which was placed here for advertising myself.—De Saurin." The barber, however, was not satisfied, and insisted that the photo should be returned. The defendant pleaded that the photo was part of the "goodwill" purchased from his predecessor, Barnett, and in the alternative, he said, "How do I know the photo is 'The Marvel's'? It may be him, but it may not be his. Somebody else might claim it, and then when it's 'gorn' he will be coming round for it, and I shall be held liable ag'in. I want a definite decision as to what I am to do.—A definite decision was soon forthcoming, and defendant was ordered to return the photo, or in default to pay the £3 claimed for it.

an enlargement and one a direct print—suggesting that the enlargement was apparently of a different perspective to that of the smaller print. Several speakers suggested that this would be explained by the fact that the enlargement was much more vigorous than the smaller print and that the difference in the scale of gradations would lead one to the conclusion already detailed.—Mr. Philip Everitt asserted that it was an optical illusion. He and Mr. Fry agreed that it was only a question of angle of view. Looked at from a fixed point, the appearance was suggested, but if viewed at the same angle, and therefore different distances, the prints had a perspective common to both.—Mr. S. H. Fr referred to a formula for getting sepia-platinum prints by development in the bath including bichloride of mercury, chloride of copper, and acetate of lead.—A Member remarked that such a bath used hot with cold bat paper gave nice warm tones—much redder than usually obtainable—which, unfortunately, were very fleeting.—Mr. J. W. Marchant had experimented in this direction, dividing the print into two, and exposing one in a window. In a few weeks the warm tone had gone, and, compared, the other portion of the print had become decidedly fainter.—Mr. Fry said that this answered a further question he was about to put regarding the permanence of prints so prepared, or, indeed, of an sepia-platinum prints.—Mr. Everitt said that Mr. Willis himself, speaking of the use of bichloride of mercury in the platinotype process, expressed a doubt about the permanence of results so obtained.—Mr. Fry remarked that a mercury intensified negative would not give black tones on platinum paper unless the negative is varnished.—Mr. E. T. Wright gave a short lantern lecture on "A Trip Round the East Coast with a Camera. The views embraced lay between the Thames and the Tyne, and include glimpses of Lowestoft, Boston, Gateshead, &c., shipping and harbour scenes.—A vote of thanks was given to Mr. Wright.

Liverpool Amateur Photographic Society.—Mr. Geo. E. Thompson lectured before the Liverpool Photographic Association on Thursday November 15, his subject being "Three Continents in Six Weeks" (part 1). Mr. Thompson, who was introduced by Mr. Paul Lange, took his audience for a delightful tour down the Mediterranean, calling at Syracuse and Athens, then by way of the Dardanelles to Constantinople, and back again to Palestine. Landing at Jaffa, Mr. Thompson journeyed to Jerusalem, visiting the Mount of Olives, the Mosque of Omar, the Garden of Gethsemane, &c., then on to Bethlehem, Jericho, and the Dead Sea, where this part of the lecture finished.

FORTHCOMING EXHIBITIONS.

1900.	
November 23	Hackney Photographic Society. Hon. Secretary W. Selfe, 70, Paragon-road, Hackney, N.E.
, 23, 24	Cleveland Camera Club. Hon. Secretary, F. W. Pearson, 98, Victoria-road, Middlesborough.
, 23, 24	Hove Camera Club. Hon. Secretary, C. Berriington-Stoner, 24, Holland-road, Hove.
, 23, 24	Waterloo and Blundellsands Photographic Society Hon. Secretary, W. G. Eyre, 2, Mersey-road Blundellsands.

1901.	
January 14-19	Blaigowrie and District Photographic Association. The Hon. Secretaries, Blaigowrie, N.B.
February 16-March 9	Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 10a, George-street, Edinburgh

Patent News.

THE following applications for Patents were made between November 5 and November 10, 1900:—	
CAMERA.	No. 19,800. "Improved Photographic Camera." A. KERSHAW.
ROLLABLE FILM.	No. 19,884. "Improvements in the Method of and Means for Exposing and Changing Rolled Film in Photographic Cameras, also Applicable to Colour Photography." C. A. BURGHARDT, C. G. WARNECKE, and W. H. HEATH.
SHUTTERS.	No. 19,925. "Improvements in Photographic Shutters." F. A. ROEBUCK.
STEREOSCOPES.	No. 20,011. "Improvements connected with Stereoscopes or Similar Instruments for Holding and Discharging Stereoscopic Views and for Adjusting Purposes." H. HEYWOOD.
ROLL-HOLDERS.	No. 20,015. "Improvements in Cameras, Roll-holders, and Film-spools." J. E. THORNTON.
DEVELOPERS.	No. 20,052. "Improvements in Photographic Developers." F. T. PARSONS.
STANDS.	No. 20,180. "Improvements in Apparatus for Supporting Photographic Cameras when in Use for taking Photographs." R. W. SHIPWAY.
DEVELOPING BATHS.	No. 20,195. "Improvements in Developing Baths for Photographic Purposes." H. S. MORGAN.
PLATE-WASHER AND DRAINER.	No. 20,230. "Portable Photographic Plate-washing and Draining Rack." E. M. ROSHER.
FOCUSING MOVEMENT.	No. 20,226. "A Sliding Movement for Focusing the Lenses in Cameras." H. B. TATTERSALL.

Correspondence.

* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* We do not undertake responsibility for the opinions expressed by our correspondents.

A FIXING AND HARDENING BATH.

To the Editors.

GENTLEMEN,—As you have done me the honour to publish my letter re "Fixing and Hardening Bath," and to add your valuable comment thereon, I venture to offer a few more words on the subject.

Undoubtedly what you say is correct, though hardly satisfying. I think the film, in this case, would probably have left the support in the washing water, after any fixing bath, if no alum bath was used, it being intended that it ultimately should do so.

I fear that, owing to the interest I took in the theoretical side of the question, I lost sight of the practical.

What I should like to draw attention to, as misleading, is that the bath in question will not harden, although it will fix, and that probably no bath composed of hyposulphite of soda, sulphate of soda, and alum can be made to perform both functions.

What you say as to the precipitation, when forming the "acid fixing bath" you mention, is quite correct, but the precipitate formed when alum is added to the sulphite of soda is quite different—of a thick, gelatinous appearance, and much more plentiful, resembling rich cream.

What it consists of is of no practical value to know, but there are people like myself who "want to know, don't you know."

A friend, better up in chemistry than myself, says it is sulphite of aluminium, but I "hold the same opinion still."

What is of practical value to know is that alum and sulphite of soda will not remain in solution together, but that the alum will be entirely destroyed.

The clear solution left, after the bath prepared according to the formula given in my former letter, reveals no trace of alum, when tested with ammonia or caustic potash.—I am, yours, &c.,

P. O. P.

COLOUR SCREENS ON SHUTTERS.

To the Editors.

GENTLEMEN,—My attention has been called to an article in your issue of October 5 treating of an arrangement for using colour screens on shutters.

It may be of interest to yourself and readers to know that the mount of our Vademedecum set of lenses is fitted with an arrangement for using the screens, which are formed in the shape of Waterhouse stops and placed between two lens combinations. When not in use a brass ring is turned to cover the slot into which the screens are inserted.—I am, yours, &c.,

HENRY F. PURSER.

33, Hatton-garden, E.C., November 19.

[We are obliged to Mr. Purser for his letter; but, for the information of our readers who may not recall our paragraph of October 5, it should be mentioned that the arrangement then described, due to the suggestion of Lieutenant-General Tennant, consists of attaching the screen to the fronts of shutters of the Thornton-Pickard type. The use of screens between the lenses is another thing altogether, and, as no doubt Mr. Purser is aware, a comparatively old device. Eds.]

AMERICAN PHOTOGRAPHY AT RUSSELL-SQUARE.

To the Editors.

GENTLEMEN,—I regret to see that Mr. Fredk. H. Evans, in his letter to you of the 12th inst., has considered it necessary to indulge in somewhat vulgar denunciation of one who, whatever statements he may have made concerning that gentleman, made them under the misapprehension that his letter of November 2 was inspired by Mr. Day.

I accept, however, Mr. Evans' denial, and, in doing so, beg to tender him my apologies for having, at any rate inferentially, made a statement which appears to be contrary to fact.

Mr. Evans' assumption that I screen myself under a nom-de-plume for the purpose of attacking a man holding views antagonistic to my own is puerile. Personally, I do not derive any pleasure or satisfaction from seeing my name in print; and I may also add that I do not "advertise," at least, not in this way. With regard to the last paragraph of Mr. Evans' letter, in which he undertakes to give a few hints to the Editors of the oldest photographic journal in this country as to the manner in which they should conduct their paper when criti-

cising the work of an undoubtedly clever photographer (who, by the way, happens to be a personal friend of Mr. Evans), I have nothing to say further than that Mr. Evans seems to have caught the contagious egotism prevalent among leaders of the new American school.—I enclose my card, and again subscribe myself, yours, &c., TACOMA.

[The foregoing letter, written by a gentleman who occupies a position of independence in relation to the controversy between Mr. Evans and ourselves, may close a discussion whose length has given an aspect of importance to a subject which it does not really possess. It is not the first time that we have been so unfortunate as to differ from Mr. Evans in our opinion of his own and other people's photographs, as well as in regard to our method of conducting this JOURNAL; but we hope one day to please him on all counts, difficult though our task undoubtedly is. Meanwhile, let us say, in all sincerity, that, though Mr. Evans's defence of Mr. Day fully attests his chivalry and kindness of heart, it is at the expense of his discretion. Mr. Day, as his writings show, is quite able to answer for himself; but, apparently, he does not consider it worth his while to do so. Four years ago, viz., in the JOURNAL of November 20, 1896, Mr. Evans also voluntarily defended Mr. Day against the exhibition methods of Mr. Alfred Maskell and the Photographic Salon, which latter institution was sharply criticised by Mr. Evans, on behalf of Mr. Day. But things have changed since then, and by 1904 it may be our privilege to receive the blessings of both Mr. Evans and Mr. Day. Our present reward for having given up so much space, which should have been utilised in a more profitable manner than the ventilation of Mr. Evans' opinions regarding ourselves, is that the matter has its comic side, and irresistibly recalls to our mind the relationship of the two principal characters in Michael Cervantes' immortal satire, "Don Quixote." Eds.]

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:

A. E. Goodfellow, 47, High-street, Wincanton, Somerset.—Photograph of Colonel Ridley.

H. Phillips, Peabody-road, Farnborough, Hants.—Photograph of illuminated address to Sir R. H. Butler.

W. Randall, 25, Hopwood-street, Barnsley, Yorkshire.—Photograph Esq., M.P., addressing electors of Barnsley.

RIVES PAPER.—H. VOLMER. Unprepared Rives paper may be had from Marion and Co., Soho-square. We cannot say its present price, as photographic papers, generally, have advanced lately.

LENS FOR PROJECTION.—"LENS" writes: "I wish to work with a lantern at 40 feet distance from the screen, and with a lens of 10 inch focus. Would a better result be obtained with a lens of 2½ inch diameter in preference to one of 2 inch diameter?"—In reply: All things being equal, the larger size would be preferable.

BLINDS.—"G. B." says: "Our studio blinds have just been washed and rehung, but now they will not hang flat, or run true on the rollers—spring rollers. What can I do with them?"—In reply: Holland blinds, after they have been washed, rarely work satisfactorily, as they stretch unequally in the washing, even when they are afterwards calendered. We are sorry we cannot give a remedy.

OIL LAMP TROUBLES.—THOMAS HIGSON complains that the three-wick lamp with which —'s lantern is fitted smokes and covers the room with soot, and also "stinks abominably" after it has been burning for a quarter of an hour or so, and asks how that is to be avoided?—In reply: It is, we can safely say, no fault of the lamp. The "stink" is, no doubt, due to the outside of the lamp not being perfectly clean—free from oil that has crept down from the wicks when out of use. The smoke is due to the wicks not being properly trimmed and adjusted before the lamp is lighted. It should be borne in mind that after the lamp has been lighted for a little while the size of the flame increases, and the wicks should be turned down a little, otherwise the lamp is sure to smoke.

SOLUTION OF GELATINE.—G. WILLOW asks: "What is meant by a two per cent. solution of gelatine?"—In reply: It means simply a solution made with two parts of gelatine in a hundred of solution, say, two ounces of gelatine dissolved in ninety-eight ounces of water.

FORMULA WANTED.—"CONSTANT READER" writes: "Will you kindly give me a formula for a concentrated pyro-soda (10 per cent.) developer (one that will keep well)?"—In reply: "Pyrogallic acid, 1 ounce; sulphite of soda, 3 ounces; water, to 10 ounces; carbonate of soda, 1 ounce; sulphite of soda, 1 ounce; water, to 10 ounces. This will give both solutions at 10 per cent., and they will keep indefinitely. It is usual, however, to make the soda solution much more concentrated than 10 per cent."

REMOVING TARNISH FROM A SILVER-PLATED ARTICLE.—"F. R. R." writes: "Will you kindly tell me what solution will take off the tarnish on a silver-plated pot? It is very dark in tint, having been kept under a board floor for several years. If it must be rubbed off, to fetch the tarnish out of the stamped or engraved portion, it would endanger fetching the silver off the prominent parts?"—In reply: A solution of cyanide of potassium will remove the tarnish. It will be well to mix it with whiting, and apply with a stiff plate brush.

TONING COLLODION LANTERN SLIDES.—"COLLODION" writes: "Will you please give me the best formulæ for toning lantern slides, taken by the wet-collodion process?"—In reply: Collodion lantern slides may be toned with a solution of chloride of gold, say, two grains to the ounce of water, very slightly acidified with nitric acid; bichloride of platinum may also be used in the same way. So also may be the bichloride of palladium. The latter, especially, yields excellent tones. The tones yielded by all the above are permanent.

ADDRESSES WANTED.—"W. J. A." writes: "Would you kindly oblige me by telling me where there is a good place for enlargement in all classes, as I have tried several places which are no good at all? Also where I can get my photos done by the embossed enamel? If you could let me know the same I should be very much obliged."—In reply: Such questions as these we are unable to answer, as it is quite against our rule to recommend any particular house's work. We must refer our correspondent to the advertisement columns. There he will find many sources from which he can obtain what he requires.

SUBJECTS FOR CHRISTMAS CARDS.—W. COSWAY says: "I have a lot of $\frac{1}{2}$ -plate negatives that would make excellent subjects for Christmas cards. Will you please tell me the best publishing house to submit them to? As the time is short now to Christmas, I shall feel obliged by an answer in your next issue"—In reply: We may tell our correspondent that his subjects will be of no use for this year's issue, as all the publishers have long since been at work on the cards they will issue next year. We should advise him to submit prints from the negatives to different publishers of these cards, that is if he fancies they are good enough; they must be artistic, or they will not be of any use.

IDENTITY OF PROCESS.—"GREEK" writes: "Would you be so kind as to let me know how the enclosed photograph is made; they are sold here at 1s 9d per dozen? How is the negative fixed up so as to print name and address on card? Where could I obtain material to do them; also about camera, are they taken, say, six at once on $\frac{1}{2}$ -plate?"—In reply: It is merely a bromide paper print copied from a mounted photograph with the photographer's name on the mount. With a repeating back camera six may be taken on the half-plate. Any of the large photographic dealers will supply cameras for the purpose.

SUBMITTING PHOTOGRAPHS FOR PUBLICATION.—"HONOUR" asks: "Is it the usual thing in the case of photographs of current events to send them to a number of papers for illustration, or is it deemed more honourable to confine yourself to one paper? You see, in the latter case, they may not choose to insert, and then the chance is perhaps gone, because you may not have reply for some days, and then it is old."—In reply: To the extent of our knowledge there is no "usual thing" in the matter. But here in London photographers doing work for publication often submit prints to the illustrated papers in turn. In your case, living as you do in the country, we should recommend you to attach yourself to one paper.

PRINTS FOR CRITICISM.—"GENRE" writes: "I am enclosing some rough proofs of photographs which I took some time ago, and wish to know (1) what you think of them from the artistic point of view. (2) Whether you think they would do for publication in some of the journals—that is, if they are good enough. (3) I should be obliged if you also would state what salary that kind of work would be able to command in a first-class house. (4) If it is not too much trouble, will you kindly mark ones which you consider the best, and return them? (5) These photos were vignettered in the camera, according to method which you gave in your JOURNAL; are the vignettes good ones?"—In reply: The prints sent incline us to think that our correspondent is skilled in the production of pleasing studio portraiture. The effects are refined, and the lighting, posing, and vignetting good. Some of the illustrated monthly magazines might utilise such subjects for illustrations. We can give no idea of the salary our correspondent could command. Let him finish his prints and submit them to one or two good photographers. That is the only test.

WARMING A DARK ROOM.—R. POPE writes: "I have a dark room in the basement of my house, about 15×12 in size, fitted with gas water, and all necessary appliances. Unfortunately, there is a fireplace and no flue, and no means that I can see for taking flue to the outside. The level of the dark room is also below the level of the heating apparatus used for warming the other parts of the premises. Under these circumstances, I shall be glad to know how the place can best be heated? Is there a gas or oil-stove that could be used in a dark room for the purpose which would not at the same time be prejudicial to the health those who have to work therein?"—In reply: Under the circumstances we can suggest nothing better than one or other of the forms of oil stoves burning paraffin oil. These, if kept clean and the wicks carefully attended to, will emit no unpleasant fume and, if they did, they are not prejudicial to health. Ripping and Co. have several convenient forms. They may be obtained through any ironmonger.

VARIOUS QUERIES.—"CLAPHAM, S.W." writes: "(1) I notice in last week's BRITISH JOURNAL OF PHOTOGRAPHY an article on printing photos on silk. Could you tell me if there is any firm now which sells this silk ready sensitised? If so, I should be much obliged if you would give me their address. (2) Could you also tell me where I can obtain stripping films for placing on white porcelain &c. (3) If you could also inform me if there is any encyclopaedia of photography published in which one could turn up any branch of photography, and so learn the different methods, I should be much obliged? What I require is a handy reference book of photographic receipts, &c."—In reply: (1) So far as we know the silk ready sensitised is not a commercial article. (2) The Novita stripping film would answer the purpose very well; but we have an idea it has been withdrawn from the market. We know of no other. (3) Walls' Dictionary of Photography. It may be had through any of the photographic dealers, or booksellers.

LENSES FOR STEREO WORK.—"STEREO" writes: "I want a pair of first class stereo lenses, 5 in. or 6 in. focus, working at f-6 or f-7, and have been looking through makers' lists till I am confused. Can you kindly help me in this, either by indicating your preference or by directing me to some reliable little work on the choice of lens? It seems to me that a non-symmetrical has this advantage over a symmetrical, that the former allows of the front lens alone, or the back lens alone, being used, so giving different focal distances, while the complete lens gives a third. I suppose a symmetrical gives only two. Has it other advantages to compensate? I have the lists of Beck, Busch, Cooke, Dallmeyer, Goerz, Ross, Wray in the BRITISH JOURNAL ALMANAC?"—In reply: The stigmatic gives three different focal lengths. The Cooke also can be used in a similar manner, so can some of the unsymmetrical anastigmats, such as the Satz anastigmatic. All these forms are good, either when used in their entirety or as single lenses.

LENS QUERIES.—"COPY" writes: "I am thinking of going in for copying large designs, some of which are 20 inches square, more or less making negatives same sizes as the designs. Can I do so with my R.R. lenses of 11 inches equiv. focus? If not, then, what lens should be large enough for that purpose, covering sharp to the corners with the largest stop? My R.R. lens, 11 inch focus, covers well a whole plate; what size will the same lens cover sharp same size as the original? I have also a R.S. lens of about 8 inch focus, which appears to cover whole-plates almost sharp up to the corners. What size will the same cover, same size as the original?"—In reply: No. You will not be able to copy designs twenty inches square with a R.R. lens of eleven inches focus. The best lens for that class of work is one of the anastigmatic type, a that has a flat field, which the R.R.'s have not. A lens of this type will, no doubt, cover the size with a medium stop if its focus is not less than about seventeen inches. The lens named will probably not cover a much larger field, with sufficient flatness and even illumination, than those mentioned unless they are worked with very small stops.

A CURIOUS EXPERIENCE.—"VARNISH FORMULA. AN ARMENIAN READER" writes: "(1) Several months ago I developed a plate exposed to a drawing, but, having forgotten to open the shutter of the dark plate holder, nothing came out, even after 40 minutes' development. I washed and dried the plate in order to make another experiment upon it. A few days ago I put the above-mentioned plate upon a negative of a landscape, expecting to have a positive, giving an unusual exposure, or to have nothing on. I put the printing frame to a most strong light in shade in the studio. I gave an exposure of 250 seconds, developed the plate in the usual way in pyro-soda solution. I had a perfect negative. (2) You published a formula for making a negative varnish in which Manila copal should be digested in epichlorhydine. Epichlorhydine is something not easily found here. Can I substitute another easily-found substance instead of it? If not, can I use the mixture containing equal parts of glycerine and hydrochloric acid? The medium is to be used for retouching."—In reply: (1) The negative result was, no doubt, due to the reversed action of light from the prolonged exposure. (2) Copal is a resin of not easy solution, and samples of copal vary considerably in their solubility. Try digesting the resin in alcohol, and then add a little benzole. That will bring some samples into solution. The varnish, when dry, will be found too hard to retouch upon without a medium to cause the pencil to "take."

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

THE Fortieth Annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published early in December. The total number of pages in the 1901 ALMANAC is 1,552, and the volume is the largest yet produced. The text portion of the book occupies about 500 pages. It will, as hitherto, be issued in paper covers, price 1s., or cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Morgan and Kidd, of Richmond, Surrey, from a negative by Mr. W. Crooke, of Princes-street, Edinburgh. A number of other illustrations will also be found in the text matter. Over eighty articles on practical subjects, contributed by well-known photographers, form a feature of the volume. The principal advances of the year are synopsised in the "Epitome of Progress During 1900," and in the other sections, "Patented Inventions of the Year," "Miscellaneous

Information," and "Practical Notes and Suggestions of the Year," there will be found much useful matter, which, with the large collection of formulæ, tables, and other data for photographers, places at their disposal for daily reference a mass of information not to be found in any other photographic annual.

* * * The 1898, 1899, and 1900 editions of the ALMANAC (20,500 copies) were each sold out within a few months of publication.

EX CATHEDRÀ.

AT the end of the year photographic journalism in London will see an important change, for we learn that our old friend, Mr. E. J. Wall, retires from the editorship of "The Photographic News." Mr. Wall returns to an early love, laboratory work, and, as Secretary and Works Manager of the European Blair Company, will enter the wide field of celluloid film and printing-out paper manufacturing. He will there have full scope for the exercise of the very great amount of technical photographic knowledge which he possesses, and it is unnecessary to add that he will be followed in his new enterprise by the sincere good wishes of a world-wide circle of friends and readers to whom he is known either personally or by name. As we have long been in the secret of Mr. Wall's desire to take command of a photographic works, perhaps we may be allowed to say, on his own authority, that the change he is making does not in the least disturb the amicable relations that have hitherto existed between himself and those with whom he has been associated, nor will it lead to a discontinuance of his photographic writings. Still, happily, in the prime of life, Mr. Wall can look back on a splendid record as editor, author, lecturer, and experimentalist, and we should confidently anticipate that the new career upon which he is shortly entering will be the means of still more closely and successfully linking his name with the progress of modern photography. A staunch friend, a loyal comrade, as Mr. Wall has always been to us, we cannot refrain from heartily wishing him the utmost success in his new sphere of work. We

understand that he is to be entertained by some of his friends to a complimentary dinner on Thursday, December 13, at the Frascati Restaurant, Oxford-street. Mr. W. E. Dunmore, the Managing Director of the Tella Camera Company, 110, Shaftesbury-avenue, W., has the arrangements in hand, and those desirous of being present should communicate with him.

* * *

DURING the last month or two we have received many requests for information concerning the Photographers' Benevolent Association, from which it would seem that there is a widespread ignorance of the fact that that institution is no longer in existence. It may be as well, therefore, to state once and for all that the Benevolent Association was wound up some time ago; that the whole of its funds have been spent, and that nothing whatever in connection with it is left except the melancholy reflection that it was killed by the apathy and neglect of those in whose interests it was administered for over a quarter of a century—professional photographers and their employés. The cases that have been brought to our notice are sad in the extreme, and, as far as we can judge, deserving; but the tide of help for such as these no longer flows, and the only comfort that can be offered to them is the cold one that the little source to which the destitute photographer formerly looked for help in his misery or assistance in an honest effort to right himself in the battle for bread is dried up for ever. From time to time suggestions reach us that a new photographic Benevolent Institution might be established; but the idea receives no encouragement from us. In the case of the extinct Benevolent all was done that could be done to induce photographers and their assistants to lend it their practical support, but these efforts resulted in almost total failure, and we therefore cannot bring ourselves to believe that a renewal of them would be likely to end successfully. We believe we do not err in saying that during the last few years of its existence what financial support was given to the Benevolent came almost entirely from non-professional photographers. No; the Benevolent is dead beyond hope of resuscitation, and the more widely that fact is made known the better, for it may be the means of undressing some heedless photographers who, though at present in prosperity, are hiding "at the back of their heads" the fond idea that if one day adversity overtakes them, financial help will be forthcoming from some photographic friendly society to which they have carefully refrained from subscribing in "flush times."

* * *

MR. Sadakichi Hartmann, whose writings on the new American school of photography have been frequently quoted and commented on in our pages during the last eight months, contributes an interesting letter to our Correspondence columns this week. With that communication he was good enough to enclose us a leaflet of criticism relating to a number of books of which he is the author. "Christ," "A Tragedy in a New York Flat," "Conversations with Walt Whitman," "Buddha," are the titles of these books, which seem, by the tenor of the criticisms, to be of a decadent character. Of the work last mentioned in the preceding sentence, one of Mr. Hartmann's critics says that it is "strange, gaudy, fantastic—a thing all colour and incense; something gilded and monstrous as the temple of Benares." The writer adds that "by way of frontispiece,

there is a picture of the author—a long-limbed, gaunt figure of a man, with a shock of black hair and a curious Oriental face. He is half German and half Japanese, I understand. There is a racial mixture which might, one fancies, produce almost anything. In this case it has produced a poet. I use the word advisedly. Sadakichi Hartmann is a poet; he is fantastic, and, it may be, frenetic, but he has the poet's insight into life, and has, withal, the art which the poet creates for himself and can in no manner learn from others. It will be difficult for me to give you any adequate idea of this man's dramatic poem. It is vast and visionary. It is not all admirable. At times it is clouded with a green and unholy mysticism. It is built on black basalt—that black rock of pessimism which is set in the foundations of the world. It is a very strong poem. Indeed, were it not for certain frippery of verbal decoration, 'Buddha' would be in the way of being a masterpiece. As it is, I would say that there is no work of recent years (in this country) which so well deserves the attention of the critic, who sees in books something more than printer's ink and paper." It is to Mr. Hartmann that we are indebted for the application of the term "plastic psychological synthesis" to a photograph. His is a personality, apparently, of considerable interest, for to that of author Mr. Hartmann joins the profession of art critic. In the book "Buddha" we are told that there are such phrases as "rorulent love maidens," "lutescent hills," "a croak disaster," "perlaceous pallidity," &c. Readers who are not tired of reading about the new American school, may this week find a little amusement in perusing Mr. Hartmann's letter by the light of the self-revelation with which that gentleman has supplied us in the circular from which we quote.

* * *

THIS week we reprint from the "Journal of the Royal Photographic Society" the address delivered by Mr. Holland Day at the opening of the Exhibition of American Photographs, at 66, Russell-square. Mr. Day's remarks have not hitherto been published in full, and probably of the many who have inspected and discussed the collection of photographs which he brought over from America, few have had the opportunity of reading what Mr. Day himself has had to say about them and their producers. We must do Mr. Day the justice of noting that, unlike many of his fellow-countrymen and some persons on this side of the Atlantic, who have interested themselves in the progress of pictorial photography, he expresses his ideas on the subject, unconventional though they plainly are, with clearness and moderation. The discussion which followed Mr. Day's address brought out one point only, viz., that some of those who had previously looked at the American photographs on the walls "did not know," as the handy colloquialism conveniently expresses it, "what to make of them." In reference to the sacred subjects, Mr. Day said it was his custom at home to hold an annual exhibition of the year's work, and that so much discussion was created by the pictures referred to that he issued special invitations to a private view of them. The persons invited numbered between 200 and 300, and included clergymen, very many members of the Church of England, and representatives of a variety of religions from Quakers to Jews, two-thirds of whom came to see the pictures with a very strong prejudice against them, but he had yet to learn that but one single

individual left the exhibition with those same prejudices. Finally, he added the following item of information, which will, we think, surprise most English photographers: "In America a photograph is regarded more as a portfolio-piece, or as a piece to hang as a foil near a painting or a larger drawing. That, of course, is almost the opposite view to that which is most generally held in England; but we have felt that a photograph is too choice to be placed upon a wall where it can always be seen, 365 days in the year, without having a rest from it. We have adopted, perhaps, the Japanese line of thought, and I believe that if a photograph is taken out occasionally and looked at in the hand, in the same way that one would treat etchings or lithographs, it will be more highly appreciated." We have referred to Mr. Day's address and his subsequent remarks with the object of placing our readers in full possession of the motives by which he was actuated in the organisation of a most remarkable exhibition. At the same time our extracts will perhaps help to a better understanding of Mr. Day's aims and ideas, which, if they do not commend themselves to our notions of what is desirable in photography, are at least entitled to attention.

* * *

SIR John Evans, K.C.B., F.R.S., the new Chairman of the Council of the Society of Arts, devoted his address at the opening meeting of this session to the subject of the origin, development, and aims of our scientific societies. Incidentally, he pointed out that a society is an association of persons united together by common tastes and anxious to improve or extend some particular branch of knowledge, or even the whole range of scientific inquiry. With this object in view it becomes necessary to hold periodical meetings for the discussion of subjects in which the society is interested, and for taking such action in respect of them as may seem desirable. The holding of such meetings involves an organisation and the appointment of presidents to take the chair at meetings, of secretaries to summon them, and of a treasurer to receive those subscriptions without which an association of the kind cannot exist. Moreover, Sir John added, for the determination of questions of policy and finance, especially when the society issues publications, a council of some kind becomes a necessity. It is on this organisation that the success or failure of a society mainly depends, and the questions as to the length of period that presidents and others should remain in office, what proportion of new blood should be infused into the council each year, and how far those in power are carrying out the views of the bulk of the members of the society, have frequently been discussed with more or less warmth. In some instances the too conservative apathy of the council has led to disruption and the foundation of new societies, or to the society under their charge being reduced to a state of inanimate slumber, while, on the other hand, too revolutionary measures have led to diminutions in numbers, if not to absolute rebellion. Much, of course, of the welfare of a society depends upon the character of its publications being kept at a high level, and on their being brought out with scrupulous regularity.

* * *

THESE wise words should be borne in mind by those responsible for the management of the two or three hundred photographic societies in this country, for in indicating the

main lines on which these bodies may be successfully conducted, they also mark out for notice the pitfalls to be avoided. We have in mind at this moment only too many societies whose condition of inanimate slumber is clearly traceable to the faults of executive apathy. The parent learned societies, according to Sir John Evans, are the Society of Antiquaries and the Royal Society, all other learned societies being offshoots of those two. The Society of Arts, he also pointed out, is the source of origin of many societies devoted to engineering, chemistry, sanitation, art, education, &c. One of the first, if not, indeed, the first public exhibition of pictures, he tells us, was that held in the Society of Arts' rooms in 1760, and from this exhibition sprang the Royal Academy, the first exhibition of which, comprising 136 works only, was opened in 1769. "We may, therefore, here claim the Royal Academy as in a certain sense an offshoot from our body. The Royal Institute of British Architects, founded in 1835, may also in some degree be regarded as connected with the Royal Academy, which admits architects among its members. The Photographic Society also grew out of an exhibition of photographs, the first of the kind, held in our rooms. The foundation of the Royal College of Music is likewise due to the exertions of the Society of Arts." The history of the connection of the Photographic Society with the Society of Arts is perhaps not generally known.

STUDIO BLINDS AND SCREENS.

CONTINUING our study of this subject, we may now consider the shape that it is desirable that the blinds—opaque transparent—should be made. It is obvious that it would be quite out of the question to give a list of the forms of blinds in the various studios to which we have been privileged of entry. It will suffice if we select a typical studio, real or mentally outlined. But, in the main, it will be found that the opaque blinds run either lengthwise or across the studio, the translucent either following or opposing the direction in which the former work.

Taking the opaque screens first, it will be observed that the greatest control of effect is obtained by blinds moving in a direction from and to lens and sitter or vice versa. When they are placed at a height of ten or twelve feet it will be found that a vast difference is produced by an advance of the light screen to a distance of two or three inches only, the shadows under the eyes and in the cheeks being intensified or reduced as the blind is moved nearer or further from the sitter. Hence our preference would be given to a series of blinds parallel to one another, starting from the light nearest the floor and continuing up the side and along the roof till they cease to screen the light at all. A useful width is forty inches, that being a common width of fabrics suitable for the purpose.

These blinds, then, suitably suspended, work backwards and forwards between sitter and camera. The blinds, on one set of supports, should not, however, be in a single piece, but should be divided into at least three sections, with as much extra length as would suffice to extend half as long again as the space to be screened is long. By doing this it will be observed that an illuminating pencil of light, narrow or broad, can be made use of at any point in each

tier of blind, a plan that will permit of equal light control at either end of the studio, and so permit the sitter to be placed either near the east or the west wall. Further, the blinds being thus arranged and placed in tiers, the illuminating pencil can be directed from either zenith or horizon or any point between, or include the whole range between. How are the blinds to be held or suspended? The usual method is to fit up the studio with pairs of iron or brass rods, and run the blinds along them by brass rings attached at intervals. The disadvantage of this system is the cost and time involved by the need for employing a skilled workman to fit the rods securely and the difficulty of making any alteration in their arrangement when once fitted up should it be thought that any improvement could be made. Otherwise they answer admirably. A far simpler, cheaper, and equally serviceable method is that described in our columns a quarter of a century ago by an esteemed contributor long gone over to the majority, Mr. Sutton, who had seen the plan in operation in one of Mr. Watmough Webster's studios. The blind supports are simply lengths of iron wire rendered quite taut by screws such as are used for iron wire fencing. A five-inch screw of this kind is quite long enough to screw up twenty or thirty feet of strong wire as tight as a violin string. Instead of stitching the rings to the blinds, Mr. Watmough Webster, we believe, now threads the rings permanently on the wire and attaches the blinds to them by a special sort of curtain hook, which can be purchased at the ironmonger's. When the wire is made taut the blinds work so freely that the whole length may be reefed up close and sent from one end of the studio to the other with one push from a wooden rod used for arranging them. Cords and pulleys are needless. In arranging such a system due care must be taken that a certain amount of overlapping is allowed for, or light would come in between the tiers and spoil any special arrangement desired. A distance of six inches between each suspending ring will be useful, which will involve each tier, or, at any rate, horizontal tiers, being about four inches apart (in addition to the allowance for overlapping).

Translucent blinds will be useful for two purposes—to reduce the intensity of the light from any particular region or as interposing media to prevent direct sun rays passing into the studio. It would be as futile as difficult here to lay down special instructions, as the causes for their being made use of are infinite. The first objection that naturally arises would be the readiness with which most white fabrics gather dust and so become yellow and light-obstructive rather than diffusive. For this reason the employment of such blinds is, in many studios, more honoured in the breach than the observance. Where they are employed they are more frequently put upon rollers than hung from supports, like the opaque blinds. The great objection to this plan is, as we have stated, the use of cords and pulleys that are so apt to stick and jam at the most inopportune moment. There is an immense variety of fabric available—jaconet, nainsook, book muslin, butter muslin, tracing cloth, &c., &c. As we have already said, the latter is unsurpassable, but it has one great drawback, it can only be used either on rigid screens or wound and unwound from a roller; it will not wrap or run in folds like a soft fabric. As simple a plan as any is to wind it round an ordinary blind roller

fixed suitably, perhaps across the roof rafters and kept from swaying by one or more strained wires on which it rests when unwound. If the blind is supplied with the usual wooden or other bar at its end, this can have a cord attached, and the whole pulled and kept tight by securing the cord to any of the ordinary contrivances for securing blind cords.

With regard to all these blinds and screens, their varieties, arising from special needs and varying shapes of studios, are so great that it would be possible to write a goodly-sized treatise on them alone; but we trust that we have been able to condense our instructions sufficiently to be of practical use to any intending studio constructor.

Wide-angle Portrait Lenses.—Since the improvements in the manufacture of optical glasses, by the Jena firm, which have put such a power in the hands of opticians, of new photographic lenses there seems no end. The latest achievement is, of course, the "Unar," an article on which, by Dr. P. Rudolph, appeared in our columns a fortnight ago. This new lens has an aperture equal to $f\cdot4\cdot5$, which corresponds pretty nearly with that of most of the commercial portrait lenses of the Petzval form, but it covers a much larger field. It is said to include an angle of 65° . This means, roughly, that a lens of twelve inches focus should cover a ten by eight inch plate, and we may take it from so good an authority as Dr. Rudolph that the Unar will do so. But will portraitists be wise to employ the lens on the full size it is capable of covering? The usual Petzval portrait lens, for whole-plate pictures, is as a rule about sixteen or seventeen inches equivalent focus, and we know that, to take a three-quarter or half-length portrait with such a lens, the camera must be approached pretty close to the sitter, with the result that the perspective becomes violent and unpleasant; therefore what will it be if a ten by eight plate portrait is taken with a lens of twelve inches focus? It is generally conceded that the most pleasing perspective, in portraits, is secured when the focus of the lens is not less than double the length of the longest dimension of the picture. It is for this reason that the ordinary cabinet portrait lens is from eleven to twelve inches in focal length, which permits the camera to be placed a good distance from the sitter, and we all know how pleasing are these pictures. But what would be the result if the camera were placed so close to the sitter that a ten by eight portrait were taken with the same lens, if it had the power of covering that size plate, and the Unar would do so? The form of the lens, or the glass it is constructed of, makes no difference in the perspective, that is governed by its focal length and the size of the picture taken within it. This lens, like the stigmatic, puts an immense power at the command of portraitists, but will they display wisdom in using them to their fullest extent? We think not when pleasing portraits are the chief objects of the photographer's consideration. The most satisfactory results in portraiture are those which are taken when the camera is placed at a considerable distance from the sitter, and this comes to the fact that the lens used must be of much longer focus than is necessary to cover the size of plate used. An artist, when he paints a portrait, always places the sitters at a much greater distance from him than is customary with photographers to have the camera from them. These new lenses are great acquisitions to portraitists, though they should be used with discretion, that is, not used to the full capacity of their covering powers. This is no new theme with us, as we have several times pointed out that portrait lenses of too short foci, although they may cover the size plate they are catalogued to do, are too frequently employed, hence the most pleasing results obtainable are not secured.

Granularity in Negatives.—Complaint is often made that the coarseness of the particles of silver forming the image makes itself painfully manifest in enlargements. This is generally more noticeable in enlargements from very small negatives than it is in the case of larger ones. For example, given two-

negatives, one, say, two inches square, and the other the usual quarter-plate size, and both enlarged to the same size, which we will suppose to be twelve by ten inches: the former will appear much coarser than the latter, for the reason that the particles of silver forming the image of the smaller negative are of the same size as those composing that of the larger one, and obviously they are magnified in proportion to the enlargement, and thus become more manifest than if the amplification were less, as in the case of the larger-size picture. Hence lantern slides made from very small negatives appear much more granular when shown on the screen than do those which are taken, say, on quarter-plate negatives. How, then, can this granularity be ameliorated in making enlargements on paper? It may to a great extent be done by making the enlargement with the lens slightly—very slightly—out of focus. This, if judiciously done, will not materially degrade the general sharpness of the picture, though it will subdue the coarseness or granularity to such an extent that it will not be painfully manifested. Professional enlargers are fully cognisant of this fact, and often take full advantage of it. So they do when they have a portrait which has been elaborately, yet coarsely, retouched to deal with. By making the enlargement with the lens very slightly out of focus, a harmonious result is obtained which otherwise would be crude and offensive.

Sepia Platinum Prints and their Permanency.—There is no question that the platinotype process is more generally practised now than it ever was before, and of late years there has been an increased taste for prints, by this process, of a sepia tone. At a recent meeting of the London and Provincial Photographic Association a question was raised as to the stability of platinum prints when the sepia colour was obtained by the aid of mercury and other metallic salts. The general consensus of opinion, as given in the report of the meeting, seemed to be that they were not stable, or at least not so stable, as those of the usual black tones. Now, the platinotype process, where the image is developed with the usual oxalate developers, does yield results that are undoubtedly permanent, and if the prints made of the sepia colour, by the aid of mercurial or other metallic salts, are not, it should be more generally known, that is, if it be a fact. Some authoritative statement, one way or other, would be interesting to those who employ the process for this colour of picture.

Lectures on Different Artists' Work.—At the meeting of the Photographic Club, last week, Mr. J. P. Goodwin gave a very interesting and able lecture on Fred Walker, A.R.A., and his Work. The lecture was illustrated with a large number of slides of his pictures. They were made from his paintings, sketches, and from engravings from them, and some from his early drawings for the wood-engraver. Now, the whole of Walker's work shown was just of the character, whether landscape or figure subjects, that could be successfully essayed by a photographer with artistic ability, the subjects being all of the homely, every-day nature, yet perfect pictures, which told their own tale. If societies would cultivate this class of lecture, one man's work throughout, it would tell more than any number of discourses on art, composition, &c., what should be and what should not be. All who are familiar with Fred Walker's work, some of which is in our national collection at the Tate Gallery, know quite well that it is the very antithesis of that affected by most of the so-called new school of "art" photographers.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

[The Third Traill Taylor Memorial Lecture.]

II.

AFTER Du Hauron applied for his patent, but before there had been any publication of his method, Chas. Cros, of Paris, proposed a system of trichromatic photography in a communication which appeared in *Les Mondes*, February 25, 1868, and it is stated that he had described the same system two years before in a sealed mémoire deposited in the Academy of Sciences.

Cros also proposed both positive and negative synthesis. He at first appeared to accept red, yellow, and blue as the primary colours of light, and described methods of positive synthesis by triple lantern projection, by application of the principle of the zoetrope, by an arrangement of transparent reflectors, and by a prismatic device, employing in each case photographic positives from the original negatives, and red, yellow, and blue lights. For the production of colour prints he said the same negatives could be used, and the prints made in the "antichromatic" colours, "green, violet, and orange." Cros here clearly avoided the mistake of Collen and Du Hauron of trying to record two primaries in each printing negative, and it is remarkable that his printing colours, "green" and "violet" (purple), are just as near to the true printing colours, *minus* red, and *minus* green, as are true blue, and red. Afterwards, in the same article, he expressed the opinion that it might be better to make the negative by "green, orange, and violet" rays, and the prints in their "antichromatic" colours, "red, blue, and yellow."

Cros did not recognise red, green, and blue as the correct triad of primaries, nor that the "blue," and "red," or "green," and "violet," printing colours should be green-blue and crimson-red. There was no suggestion of anything so definite as analysis by colour-curve screens to be followed by positive synthesis with pure colours.

Cros' suggestions were generally of a somewhat speculative character, and he amusingly disclaimed any wish to submit himself to the "painful" labour which he could foresee would be necessary to arrive at a practical realisation of colour photography by such a system. He said he preferred to show the way, and to claim the credit after somebody else had done all the hard work. By this decision he proved himself to be, from a material point of view, one of the wisest men who ever attacked this problem, and, this being his position, he could afford to be somewhat vague—the more so the better; but some of his suggestions now appear wonderfully acute and prophetic, and are worthy of special notice.

For instance, Clerk-Maxwell and Collen both recognised the necessity for colour-sensitive photographic plates in order to practically realise their ideas, and Du Hauron was content to give enormously prolonged exposures so as to utilise the extremely feeble colour sensitiveness of the ordinary photographic plates of that time. Cros, who also recognised this difficulty, pointed out that a photographic plate can only be acted upon by light which it absorbs, and said he thought it might be possible to make the plates colour-sensitive by incorporating suitable dye-stuffs. In this publication he clearly anticipated the "principle" of "optical sensitizers," as it was afterwards stated by Dr. Vogel, and, although he appears to have thought that the mere colouration of the film might serve to make the plates colour-sensitive, it is a remarkable fact that he said a search should be made among a class of dye-stuffs, some of which actually do confer colour sensitiveness to bromide of silver plates!

Cros not only anticipated Du Hauron in the matter of actual publication, but was quite as fertile in original suggestions, and was, I think, more of a scientist, if less of a mechanic, than his rival.

I believe the names of Clerk-Maxwell, Harry Collen, Baron Randonnet, Louis Ducos Du Hauron, and Charles Cros complete the list of independent inventors of trichromatic photography.

Although Clerk-Maxwell was the first, there is in the original publications of Collen, Du Hauron, and Cros, internal evidence of independent conception of the idea.

Assuming that I have correctly set forth the essential conditions of success in trichromatic photography, and that I have fairly represented the publications of the original inventors, propositions by which I am prepared to stand or fall (I have recently studied the publications of Du Hauron and Cros most carefully), it follows that, brilliant as were the conceptions of these inventors, they failed to recognise requirements essential to success; and I do not hesitate to say that this is the true explanation of the discredit into which this idea had fallen after many attempts to reduce the methods to practice.

Du Hauron and Cros continued to try to perfect and exploit their ideas, but made very little real progress that I have been able to discover, except that Du Hauron made distinct improvements in cameras

for making the colour records, and Cros in 1879 ("The Review of Games, Art and Sport," Feb. 15, p. 221) had definitely settled upon "orange, green and violet," as the "primary" colours of light, and stated that the prints should be made in pigments which suppress the respective primaries. After nearly twenty years (from the dates of Du Hauron and Cros' publications), although all the materials requisite to experimental success had long been at hand, the principle had not been confirmed by a single really successful result, and was apparently universally discredited.

Meanwhile Dr. H. W. Vogel, in 1885, stated as a "new principle," that the negatives should be made by the same spectrum rays that are absorbed by the printing colours, and in the same proportions—in other words, that the "optical sensitizers," or colours spectroscopically identical with them, should be the printing colours. This was only another way of stating Cros' principle of printing in colours "antichromatic" or complementary to those which produced the negatives.

Dr. Vogel's statement of this "principle" disclosed no recognition of the relation which the negatives or printing colours must bear to the physiological analysis of the spectrum colours, thus missing the most vital point; and it is under no circumstances a true principle in trichromatic photography, but at best involves precisely the same error as the theory that positive synthesis should be effected by screens which transmit all the various rays which have acted to produce the respective photographic "colour curve" records. I hope I have made it clear that the true function of the printing colours is to subtract most efficiently (specifically) from ordinary white light the visual impression belonging to the respective colour elements, and that this is not effected by colours complementary to the correct photographic action. Notwithstanding the errors involved in Dr. Vogel's theory as applied to the trichromatic process (he also proposed a more complex analysis), the weight of his authority caused it to be generally accepted in Europe, and it is still a stumbling-block for many experimenters.

It was the acceptance of this theory that made Von Hübl, in 1888, declare that the Young-Helmholtz colour theory is not a suitable basis for a theory of three-colour printing, and that he could not see in what way it had indicated to me the correct printing colours.* Having no theory to guide him but Vogel's, Von Hübl worked out the details of a method which, assuming that he actually worked to his diagrams (see the *Amateur Photographer*, January, 19, 1884, p. 47), would reproduce the spectrum itself as three broad bands of equal and much diluted colour, with only very narrow spaces of blending between.

Thus does false theory lead to error; and yet this method, which would completely break down upon the spectrum itself, is described in one of the technical journals, nearly six years after the publication of the principle of colour curve analysis, as "enriching our literature on this subject with the clearest exposition of the theory yet propounded!"

Dr. F. Stolze, of Berlin, published a series of articles treating of the theory of trichromatic photography, the date of which I cannot give, having never seen them in the original. Translations appeared in *Anthony's Photographic Bulletin* in September, October, and November, 1888, but it has been stated that the original publications appeared some years before. Dr. Stolze was probably the first to mention the Young-Helmholtz theory of colour vision in connection with this subject, and to point out that the most that could be expected of a trichromatic process was that it should more or less perfectly counterfeit most of the spectrum hues to the eye by colour mixtures physically different from the original colours.

Dr. Stolze's writings were not reproduced in English, and did not come under my observation until long after I had published similar observations, which he then claimed, very justly I have no doubt, to have in some measure anticipated. He treated of the subject only as applying to the production of colour prints, and did not formulate a definite principle, or recognise the practical bearing of the Maxwell measurements of spectrum colour mixtures, and his conclusions were distinctly antagonistic to hopes of practical success. My own experiments commenced early in the year 1878, and before the end

* *Process Photogram*, April 1888, p. 53.

of that year I had at hand all the material means requisite to success such as perfect colour-sensitive plates, control of the absorption of colour screens, a method of producing half-tone process blocks for carrying out the idea in typographic printing, &c. Nevertheless, my results, even in lantern projections, were crude and discouraging. My theoretical knowledge of the subject was inadequate to discover the sources of error. Like Du Hauron, I gradually improved my results by sheer experience, but I am now perfectly convinced that complete success could never have been achieved by such a process of trial and error.

I became convinced that a quantitative analysis of the various spectrum hues in terms of three spectrum colours must form the basis of a successful method, and stated this principle and the method of its application somewhat clumsily in a paper read before the Franklin Institute in February 1888.*

My analysis was, however, imperfect, and it was only after some reference to Maxwell's work in spectrum colour analysis which appeared in Rood's "Modern Chromatics" came under my observation that I was able to perfect my method, and to clearly and perfectly enunciate the principle of colour-curve analysis and pure-colour synthesis, which I did in a paper read before the Franklin Institute in November of the same year.†

The application of this principle resulted in the accurate reproduction to the eye of the colours of the objects photographed—something which I then believed, and still believe, had never before been accomplished, and which probably never would have been accomplished by a trichromatic process without recognition of this principle.

I think I am correct in saying that the soundness of my theoretical exposition of the subject was soon recognised by Dr. Stolze, Victor Schumann, and Sir W. Abney, but that it was actively discredited though without argument, by almost everybody who had previously become identified with the subject in the public mind.

Apparently unanimous condemnation by "practical experts" had the effect of persuading most people that my method must be wrong and my results tricked, and the wheels of progress continued to be clogged by voluminous writings which served chiefly as a negative means of discrediting an important truth.

I mention these facts in explanation of the aggressiveness which I have shown in my fight for recognition of this principle, and which has often been mistaken for a mere ebullition of egotism. I submit that, as a conscientious teacher, I could not do otherwise than maintain that by the application of this principle the problem of recording and reproducing colours by photographic analysis and optical synthesis was finally solved.

This course on my part has been all the more necessary because in some pretentious treatises, such as that of Alcide Ducos Du Hauron, published in Paris as recently as in 1897, the principle of colour-curve analysis, to be followed by pure colour synthesis, is not even stated, and the principle of analysis is no more definitely stated than that the negatives should be made by "orange," "green," and "violet" light; and in the "melano-chromoscope" credited to Louis Ducos Du Hauron, and only recently manufactured for sale, the photographs are supposed to be made through the same screens that are used for synthesis. Such loose methods may serve as playthings, but they no more represent scientific trichromatic photography than a child's use of a sixpenny prism represents the science of spectrum analysis.

Since this part of my lecture was in manuscript I have had the great pleasure of perusing a treatise on trichromatic photography by an English author, who has not only recognised the principle of colour-curve analysis and pure colour synthesis, but has presented the subject in a most admirable manner. No doubt many who have found my own essays too concise and dogmatic in style to appeal to them successfully will find Mr. Tallent's fuller arguments and illustrations sufficiently convincing. It needed only the publication of such a treatise as this to put a period to my aggressiveness in a fight which has become distasteful to me.

Owing to the great number of factors in this solution of the problem of colour photography, a very great amount of work remained to be

* *Journal of the Franklin Institute*, Philadelphia, May 1888.

† *Journal of the Franklin Institute*, Philadelphia, January 1888, p. 58.

done in order to realise the conditions of successful every-day practice and general application.

Without special cameras for making the colour records automatically and special devices for accomplishing the synthesis, the method could never have much practical value. Both Du Hauron and Cros recognised this fact, and the former especially sought to provide for these requirements, and made some brilliant suggestions, without, however, meeting all the practical requirements.

The principal optical devices employed in carrying out the process in its ordinary forms are special cameras, triple lanterns, and photo-chromoscopes. Within the legitimate limits of this lecture I cannot describe these in detail, but will mention their characteristic features, and will give such references as will enable anybody to verify my statements and study the more intricate details.

A feature common to most of the cameras and photo-chromoscopes which have been proposed is the use of transparent reflectors, so disposed as to form three images with one objective or one view point when used as a camera, or to superpose the three photographic images upon the retina when used as a photo-chromoscope. Both Du Hauron and Cros proposed the use of plane parallel clear glasses for this purpose. Du Hauron went further; recognising that the two separated reflecting surfaces would double the outline of the images and produce confusion unless the positive images were optically at an infinite distance, he proposed the introduction, between the reflectors and the image, of convex lenses at exactly their focal distance from the images.

This arrangement, as originally conceived, was optically efficient as a photo-chromoscope, with the three images situate on different planes. In 1876 (British Patent No. 2873, July 22), he designed a camera involving the application of this principle, in which the three convex lenses were used as image-forming objectives, with a separate adjustable diaphragm for each lens, in order to equalise the exposures, and the use of convex lenses in front of the camera to parallelise the rays for near objects. As the rays can only be parallelised for one plane at a time, objects situate in all other planes would still be doubled in outline.

In a combined camera and photo-chromoscope the construction of which was first published in 1887, and which has been named the "melano-chromoscope," the plane parallel glasses and convex lenses are so disposed as to bring the three images all on one plane,* but this construction involves the application of new ideas which I patented in 1884,† and a description of it is therefore not altogether in place at this point in my lecture. Waiving this objection to such an order of presentation, I will point out some of the defects of this instrument.

In the first place, it is optically imperfect except when used under certain well-defined conditions, because the convex lenses are at three different distances from the view point. The effect of this is to introduce different degrees of barrel-shaped distortion in the three images, when used as a camera; and while this does not prevent the instrument from superposing the same images in synthesis, provided that they are images of distant objects, it is incapable of perfectly superposing to the eye three equal images, and it cannot be used successfully for photographing near objects, because, the image-forming lenses being at different distances from the object, the three images will not focus alike either as to definition or size.

Any photo-chromoscopic device which is designed for analysis and synthesis with the same colour screens, like this one, I would class as a toy. Made as two separate instruments, one adjusted for photography and the other for synthesis, it could be made to meet scientific requirements for the reproduction of landscapes in miniature, but the difficulty and cost of obtaining clear glass reflectors with perfectly plane-parallel surfaces, the fact that the images are not available for synthesis by other methods because not identical in perspective, the impossibility of focussing near objects on all three sections of the plate at once, the impossibility of diaphragming separately for the three lenses, and the small angle which the images subtend to the eye,

* "La Triplique Photographique des Couleurs et l'imprimerie," Paris, 1887, p. 357.

† That he did not originally contemplate a one-plate arrangement is proved by the wording of his specification of 1876, p. 15, lines 48-54.

are all serious defects. Another defect in the instrument as now constructed, due to the fact that the clear glass reflectors disposed at 45° angle to the axial ray have polarising properties, I shall describe later, also a defect of illumination of the image due to the relation of incidence and reflection with glass mirrors.

Charles Cros suggested positive synthesis by persistence of vision with a device constructed upon the principle of the zoetrope, and his brother, A. H. Cros in 1889,* patented a device for carrying out this idea. Cros' instrument was of the three-step form characteristic of photo-chromoscope, constructed with two transparent and one silvered reflector, but the images were blended by means of a rapidly revolving wheel having four plane silvered and two clear open sectors, in combination with another plane silvered mirror occupying parallel planes disposed at 45° to the axial ray, and the wheel revolved by pulling a string wound upon its axle. This device was intended to be used also as a camera for making the three negatives through the same colour screens.

F. E. IVES.

THE NEW SCHOOL OF AMERICAN PHOTOGRAPHY.

[An address delivered before the Royal Photographic Society on October 10, 1900.]

In acknowledging, some months ago, an invitation to show in your rooms a series of my own prints as a "one man exhibit," I took the opportunity of saying that I hoped I should be able before the end of the year to lay before your Council a far more interesting proposition, in the shape of an offer of a collection of work by the leaders of the new school of photography in America. That hope is thus evening realised, and I believe I am quite within the truth—in spite of the fact to be regretted that some well-known names are absent from the catalogue—when I assure you that never before has it been possible for any outside the United States, to see, in a body, so complete a collection of prints by those who are the acknowledged leaders on the other side of the Atlantic.

Through the kindness and sympathy of many of you here in England, British work is, I think, better known in New York, Philadelphia, and Boston than is ours in London. The causes for this state of affairs are manifold, and it would be as unprofitable as uninteresting for me to enter upon them at this time; but I wish most heartily to show my appreciation for the opportunity of handing the collection under your auspices, and of pointing out a few essential differences in the point of view adopted by our workers to that which seems to be the general ground taken in England.

That we have in the States two distinct schools of photography is far more apparent than in the work I have had the pleasure of knowing as produced here: with us they are designated the old and the new schools, the chief point of theoretical difference being that the new school holds tenaciously that photography may be, if it is not yet, a fine art, and that the day is not far distant when it will be generally so acknowledged—while the old school, well, they smile the smile of time-honoured incredulity. During the past two or three years, however, I am glad to say, this smile has become less aggressive, less certain, and somewhat inclined to suspect its own justice.

That the special theoretical differentiation of schools is a good deal of a personal hobby with me, perhaps I need not affirm; and perhaps, too, I should note that I have had the honour of making addresses on the subject at Harvard University, and before the State Normal Art School for teachers of Massachusetts; but these statements will tend to show you something of the awakening which is beginning to be so strongly and widely felt in America to the new possibilities of the camera.

With us the painter is more ready with serious encouragement, more open to conviction, that the photographer, as well as the etcher, may possess the right to go hand in hand with him. This feeling in the painter is one of so much seriousness that a few have already taken up the camera; in the first place, possibly, as an aid to their colour work, but ultimately as a distinct end in itself. Of this class there are at least three represented in the collection now upon your walls: Mrs. Sarah C. Sears, of Boston, who has two colour portraits in the Paris Exposition which have secured "honourable mention," and which are hung "on the line" between those of Mr. Whistler: Mr. Frank Eugene, of New York, who received his art training in Paris and Munich and has been a portrait painter of eminence for some

* British Patent No. 9012, May 30, 1899.

years; and Miss Sarah J. Eddy, of Providence, for a decade a successful painter of "genre."

Of another group but once removed from these, are a handful of artists—yes, I dare call them artists—who have served their time at Juliens or other institutions for art training, to return home and aptly what they had learned to the work not of the brush but the camera. Of these Mrs. Gertrude Kasebier, of New York, is unquestionably at the head, and although her work has not been known through exhibition more than two or three years, her right to a very high place among the genuine portraitists of the world, whose medium of expression is the camera, is not contested—at least by painters. Others who have taken up the camera after an art training are Miss Eva L. Watson, Mr. C. Yarnell Abbott, Miss Mathilde Weil, all of Philadelphia; and Miss Ben-Yusuf, of New York; while Mr. Edward Steichen, of Milwaukee, is at present devoting himself to the study of both painting and photography in Paris.

Of the appreciation of painters, the most cordial praise of Mr. Whistler for Mr. Clarence White's "Girl with the Pitcher" naturally stands first, quite as much perhaps from the well-known antipathy of the butterfly to photography in general, as on account of his pre-eminence. Boutel de Monvel has been very enthusiastic of prints now before you, while Daniel French, J. W. Alexander, Wm. M. Chase, Robert Vonnoh, Frederick Vinton, L. C. Perry, and Denman Ross, all artists medalled or otherwise honoured in Europe, have freely expressed their entire sympathy and approval in the new movement. While this appreciation, perhaps, may be individual and personal, there is one, if less authoritative, yet more widely felt and recognised as such by the many—I mean that of our art institutions themselves. So long ago as 1896, while M. de Sezuerenne was writing for the "Revue de Deux Mondes," his then exhaustive article, "Is Photography a Fine Art?" there was held in Washington the first exhibition of photographs in America to be known as a Salon. From this collection the Smithsonian Institute—practically the department of Fine and Liberal Arts of our Central Government—purchased a large number of prints for perpetual exhibition in their galleries. Two years later the Pennsylvania Academy of Fine Arts in Philadelphia opened its doors to the photographer. The paintings were removed from the walls of two of its largest halls, and during six weeks the public were able to attend what is termed the First Philadelphia Salon. This exhibition was so eminently successful that last autumn found it repeated with even a grown enthusiasm, when it was estimated that between ten and twelve thousand people visited the second Salon. From these exhibitions numerous purchases were made by the Fairmount Institution of Philadelphia, one of similar aims as your South Kensington Museum, where a special section is devoted to the uninterrupted exhibition of the new school of photography. This spring found this recognition spreading, when the Art Institute of Chicago held a small but very choice exhibition of photographs; and at the present moment, as you are doubtless aware, the third annual Salon is about to be opened in Philadelphia, while in Boston the full consent and approbation of the authorities of the Museum of Fine Arts has been granted for such an exhibition in the near future. Mere local organisations like the Carnegie Art Institute of Pittsburg, the Case Library of Cleveland, and the American Institute of New York—which, by the way, is the oldest photographic society in America, almost equalling yours in point of age—have for some years shown annually collections of photographs, while the first-named has proved a worthy patron as well as a hearty appreciator.

These facts will show very strongly, I believe, that although less than almost any other, we in America have, in the mass as well as the individual, taken a quicker, keener interest, and evinced a surer belief in the possibilities of the camera as a medium of artistic expression than has any other people.

How many, I wonder, in discarding a piece of camera work, stop to consider from what it is they remove it? or whether its maker felt what he produced more keenly than the maker of half the paintings hung in any annual show? or whether the man who created it were master or but a 'prentice? These questions will be found of some assistance if applied with even the most limited knowledge behind them.

If painting be the only department of art with which comparison is made, it is obviously an unfair one, because the element of colour is here—to the many at least—the chief characteristic; and to them the values of colour found in a Durer engraving or a Whistler etching is as nought as in a photograph. But it cannot be said that colour

alone is that which produces art, for even the doughtiest critic would not proclaim as art the theatrical poster so commonly seen.

The other perfectly obvious element is drawing. Let us, for example, turn to the illustrated pages of the catalogue issued by any manufacturer of machinery. Here we find the acme of proficiency in drawing; the hand which constructed these pieces of architectural line was as completely trained as Da Vinci's; but we can hardly name the production art. Again, if we look through any large collection of paintings with care, we are sure to discover canvases whereon appear eminent names, which will display as faultless drawing as the machinery catalogue, and as sure evidence of colour as the poster—but nothing more—nothing of what is termed art. In another room, perhaps, we may find a small print from an etched plate by Rembrandt or Leyden without visual colour, and as lacking in anatomy, but yet we unhesitatingly pronounce that it possesses this subtle quality for which there is no name. It is as elusive as quicksilver, as intangible as perfume, and as vital as the fame it insures. This quality cannot be considered one of pigment or medium. Time was when its possessors knew not canvas and brush, when mallet and chisel and stone were the chief means through which it found expression. Bronze and silver were wrought in the round long before impressions from incised plates were known to be possible as a fine art, and it is only during the present century that lithography has been accorded its proper place as a medium.

To many, as I have elsewhere said, to most perhaps, a photograph is a photograph and only a photograph, and because a photograph of little or no consequence as art; but just as soon as they will learn to examine it for qualities not dissimilar to those which make etched prints and lithographs so full of charm and real value, they will find, to their own great surprise, that these qualities actually exist there in as abundant richness, providing the skill of the creators has been equal. The values of light and shade as produced with a lens run as wide and as truthful a gamut and are capable of as delicate variations as were ever produced by means of slabs of stone or plates of copper. The feeling in textures is presented with as much nicety in a print from a photographic negative as in that from a piece of engraved metal. Yet we have discovered that all this may be and no art exist, unless our example possess that subtle quality of great verity.

With you here in England, in France and Germany, and with us in my own country, there are a few earnest workers who are bending all their efforts to prove that this quality may be as fully possessed by one who chooses to express it through the means of a camera, as his brother who has made choice of other implements. The critic, too, should bear in mind that the medium is new, that scarce half a century has gone by since its inception, and not more than five and twenty years—nay, not so much—since the discovery of many of the processes which are of inestimable advantage towards the production of what he will, I believe, sooner or later be forced to acknowledge the new art.

Many years ago, before even the most sanguine of us held photography as other than a mere reproductive process, Ruskin wrote under the bias of his time, although admitting that a far-seeing eye had been led to question.

"As a photograph," he says, "is not a work of art, though it requires certain delicate manipulations of paper and acid, and subtle calculations of time, in order to bring out a good result, so neither would a drawing like a photograph, made directly from nature, be a work of art, although it would imply many delicate manipulations of the pencil, and subtle calculations of effects of colour and shade. It is no more art to manipulate a camel's hair pencil than to manipulate a china tray and a glass vial. It is no more art to lay on colour delicately than to lay on acid delicately. It is no more art to use the cornea and retina for the reception of an image than to use a lens and a piece of silvered paper. But the moment that inner part of the man, or rather that entire and only being of the man, of which cornea and retina, fingers and hands, pencils and colours are all the mere servants and instruments; that manhood which has light in itself, though the eyeball be sightless, and can gain in strength when the hand and foot are hewn off and cast into the fire; the moment this part of the man stands forth with its solemn 'Behold, it is I,' then the work becomes art indeed."

Now I, personally, hold that the time has come when this seriously uttered "Behold, it is I," may be heard in many directions. If this were not so, how should you be able to distinguish, as most of you can, without hesitation, the authorship of many prints? I cannot

imagine the veriest button-pusher in the kingdom who could not say "This is a Horsley Hinton," and "This is a Craig-Annan,"—what is this if it be not the "Behold, it is I?" Why should a Hofmeister differ from a Demachy if each man did not infuse into his work that of his personality which makes it individual? And what is this personal individuality which makes it individual? And what is this personal individuality if it be not the "Behold, it is I?"

I must, then, assume that there can be no adequate reason presented which shall hinder the affirmation that a photograph may be as fine an achievement—not to step outside either monotone or reproduction processes—as a print obtained from any other surface than that of gelatine; the fact always being kept in mind that the line and mass and values shall be as ably rendered in the one as the other. But just here we find the chief reason which withholds the possibility of naming as art so many photographic prints, *i.e.*, ignorance of even the most elementary rules of a picture's anatomy. A painter spends years in acquiring a knowledge of how to handle his lights and shadows to produce the required modelling, and more years in mastering the manipulation of tone; while the man with the camera presses the button, and idly imagines the rest will be done for him. No, let me repeat, that to produce art with the camera just as much serious thought, just as much hard study, just as much rigorous training is necessary as to produce the same end through any other medium—and perhaps a little more. This time of service in the school of sight and handling is indispensable. Save in instances the most rare the eye sees not itself unaided, and the learning to see is as difficult as the learning to walk, or sing, or read. We may walk along the Chelsea Embankment for years, yet do you suppose we will see what Whistler saw, and what he drew upon copper and stone? We may have been born under the very shadow of Ely Cathedral, but do we find in the magnificent pile what Mr. Frederick Evans has brought out in his masterly photographs?

Neither the arts of lithography nor etching were declared in a day. The former languished for years early in the century before one of Napoleon's marshals forced it into recognition in France, and with centuries added to the birth of etching, it still held no acknowledged position, as a fine art, until within the memory of many of you, Sir Seymour Hayden and Hubert Herkomer won for it the place it deserved.

It is not, then, from the performances accomplished beyond the Atlantic wherewith we arm ourselves for any strife—but it is rather that we feel we have taken one or two steps in the forefront—perhaps excited, hectic, youthful steps—yet steps outward toward a serious end in which we have grave confidence.

F. HOLLAND DAY.

A PLEA FOR STEREOSCOPIC PHOTOGRAPHY.

[Abstract of Paper read at the November Meeting of the Edinburgh Photographic Society.]

The most convenient method of securing such photographs is, of course, to take them simultaneously by means of a pair of lenses on the two halves of one plate. This entails the possession of such a pair of lenses and of a camera that will hold them side by side, but lack of such facilities need not debar any one from making stereoscopic pictures.

Many subjects will permit the two necessary negatives to be taken with one lens at two exposures, the lens or the camera being moved latterly over a distance equaling the separation of the eyes between the two exposures. For instance, I show you a tripod head which I constructed for use with a $\frac{1}{4}$ -plate folding pocket camera of the well-known Shew pattern. It permits the camera to be moved any distance latterly up to $3\frac{1}{2}$ inches. In using such a camera the only difference from the ordinary practice of monocular photography is that in filling the slides each $\frac{1}{4}$ -plate should be numbered with pencil in one corner. The plates being exposed consecutively, if the right hand exposure is invariably made first, the odd numbers will always be the right, and the even numbers the left hand negatives. The necessity of this identification will be apparent when we come to consider the printing process.

Another method with one lens is to use a $\frac{1}{2}$ -plate camera provided with a removable flexible division which practically converts it into two $\frac{1}{4}$ -plate cameras side by side. The lens being mounted on a sliding cross-front, or eccentrically on a revolving front, consecutive exposures can be made on the two halves of the same plate by moving the lens opposite each half.

Still another method useful for occasional work is simply to fix a piece of black card in the folds of the bellows so as to screen one-half of the plate, the screen being moved across at the same time as the lens.

Many modern cameras are so constructed that the front is too narrow to permit the necessary movement of the lens. In such a case, an instrument known as "The Stereoscopic Transmitter" may be used. It consists of small mirrors so arranged in front of the lens that two pictures are formed side by side on the same plate. I cannot speak from experience as to this method, but, as a lens of sufficient focal length to cover a half-plate must be used, the pictures formed on the half of the half-plate may be of rather narrow angle for some subjects. On the other hand, as the pictures are automatically reversed by the mirrors, the operation of mounting prints or making transparencies will be greatly simplified.

The use of one lens, moved between exposures, necessarily limits the choice of subjects, since nothing in motion can be so dealt with. Yet this need not deter any one from accumulating a most effective collection of stereo slides. "Still life," such as statuary, and especially flowers and foliage, are amongst the most effective subjects for this branch of photography. Architectural and most landscape subjects can also be taken with consecutive exposures. It is necessary that the two exposures should follow one another rapidly, so that any change in the position of shadows may be avoided, also that the exposure of the two plates should be as equal as possible. A trifling difference of density in the two negatives does not matter, but no detail must appear in one that is not also visible in the other, otherwise the effect is most distressing. For the same person any motion of foliage in a landscape will entirely spoil the slide.

The methods I have referred to serve excellently for occasional work, but it must be confessed that any one who practises stereo work regularly will desire to possess the means of securing all classes of subjects. This entails the use of a pair of lenses of equal focus fitted to a camera capable of taking the two pictures simultaneously. The outfit need not be expensive. Single or "landscape" lenses are often recommended, but if they are to be of good enough quality to be used at fairly large aperture they will cost nearly as much as rectilinear—of fair quality. My own pair of lenses are nameless rectilinear—of French origin I understand—working up to f-6. They cost me 30s. each, and I have every reason to be satisfied with the work they do. The enlargement I have brought for your inspection is from a negative taken at f-11—a "snapshot"—and is enlarged a little over 6 diameters. It speaks well for the virtues of cheap lenses (when carefully selected), and shows that one may go in for stereo negatives entirely, as I have done, and yet have pictures to exhibit. You will shortly see also that lantern slides can be made from those negatives. Expensive lenses are a luxury when one can have them, but they are not a necessity for this class of work.

The camera for a pair of lenses may be of any kind, about half-plate size, that has a front wide enough. It must, of course, have a division in the middle to prevent the two images from overlapping at the inner sides.

My own desire was to possess a stereo hand-camera, but at the time I wanted it there was none on the market that fulfilled my ideal. Therefore I began to make one, but in the course of manufacture new ideas sprang up, and when finished it was a sort of universal camera for stereo purposes, therefore I have brought it for your inspection.

As it comes from its case it is a box hand-camera, but at the time I wanted it there was none on the market that fulfilled my ideal. Therefore I began to make one, but in the course of manufacture new ideas sprang up, and when finished it was a sort of universal camera for stereo purposes, therefore I have brought it for your inspection.

As it comes from its case it is a box hand-camera, set for "infinity," and ready for use on drawing the slide. A camera that requires more preparation than this often loses pictures.

A lever with a graduated scale gives a focussing motion from "infinity" to five feet, more than sufficient for hand-camera purposes. By opening the front and pulling out the finder a further extension is possible, to double the focus of the lenses, thus allowing me to make flower studies of life-size, also to use the camera for making stereo transparencies from negatives by "copying in the camera." It is fitted for use on a stand for work that requires time exposure. The shutter is a roller-blind, "time and instantaneous," regulated from outside the box. A T level on the top is a vital necessity, as a level base line is a great assistance in properly trimming the prints.

The size of plate commonly called stereo size, $6\frac{3}{4}$ by $3\frac{1}{4}$. I do not like the pictures of necessity being square. Sometimes $6\frac{1}{2}$ by $4\frac{1}{4}$ is recommended, but it is not always easy to get these plates, and the saving in cost is small. I have adopted the $\frac{1}{4}$ -plate because it is easily bought anywhere, and because the height of it allows the use of the rising front with which my camera is fitted in place of a swing back. The camera was first fitted with three double slides, and I have since added a Pullman changing box, thus giving a capacity of fourteen plates if necessary.

The interior of the camera is lined with black velvet, because when photographing flowers, &c., against a dark background reflections from the sides of the camera intruded themselves. The velvet lining is a great improvement, and I think no camera should be without it.

The focal length of the lenses is $4\frac{1}{2}$ inches. This is somewhat

shorter than some authorities advise, but the lenses of $5\frac{1}{2}$ or 6 inches often used seem to me to give too small an angle for many subjects. The distance between the two images of any object on a stereo slide must not greatly exceed the distance between the eyes of the observer, and at the most cannot exceed 3 inches. With a base line of 3 inches a lens of $4\frac{1}{2}$ inches focus gives a pleasant angle of view, while with a longer focus many subjects would, I think, be difficult to deal with.

One advantage of the shorter focus is that the back combination, when well stopped down, serves as a long focus lens when the subject requires it, the focus being about $7\frac{1}{2}$ inches.

The shutter—which is built into the front of the camera—carries a pair of sliding panels, on which the lenses are mounted. This allows the separation of the lenses to be varied from $3\frac{1}{4}$ to $2\frac{1}{2}$ inches.

Whether the twin-lens or a single lens camera is used this matter of the separation of the lenses is of the utmost importance. When we look at a distant object the axes of the eyes are nearly parallel, and so are the axes of the lenses of the camera. Therefore, if the two photographs are viewed in the stereoscope they give an impression of the separation of the eyes, the photographs will represent what the eyes see under a similar aspect. If, however, the object is near at hand, the eyes in the act of viewing it will be turned inwards, and the separation between their axes will be decreased, but if the lenses of the camera remain at the previous separation they will, when used upon the nearer object, see as it were further round it than the eyes with their reduced separation can see, therefore when the resulting photographs are viewed in the stereoscope they give an impression of exaggerated relief, suggesting a cardboard model of theatrical scenery rather than the natural object. By bringing the lenses closer together this defect is obviated, and an adjustment of this kind should always be made when objects less than about ten feet distant are photographed. As a matter of fact, it will be found in practice that to arrange a similar composition on each half of the focussing screen the lenses must be approximated if the object is very near, otherwise the displacement is so great as to throw part of the subject out of one of the pictures.

In using a single lens camera, of course, the same adjustment is secured by limiting the travel of the lens or the lateral movement of the camera.

While speaking of lenses it is well to note that a Waterhouse stops are preferable to iris diaphragms, owing to the difficulty of exactly adjusting the latter so as to secure equal exposure on the two negatives. The aperture employed should be such as to ensure fair definition in all planes of the picture; "fuzziness" is entirely out of place in this class of work.

Exposure should always be full, and development should be such as to give a soft negative full of detail. The somewhat exaggerated contrast which gives a feeling of relief and boldness to a monocular photograph is out of place in a stereogram. The high lights, which merely suggest light in an ordinary print, become superfluous in stereo prints, because relief is obtained in a more natural way, and any white paper in the print suggests snow or white frost. Therefore the negatives should be rather thin, printing should be deep, and if anything appears white in the print which is not white in nature it is advisable to sun it down to a grey tint.

My own practice is to use isochromatic plates for all subjects. In landscape work they are of special value, owing to the superior detail given in green shadows amongst foliage, and it is needless to say that for flowers and foliage they are invaluable. My favourite developer for these plates is amidol. This class of developer, by first giving detail and then density, allows development to be stopped before any hardness appears. Amidol is an ideal developer for isochromatic plates, as the dichroic fog, which more alkaline developers sometimes give, never appears with this reagent.

Prints must be made on a smooth surface. The question of artistic surface does not arise in this branch of photography. The chief aim is rather to eliminate surface altogether, and to give the impression that the picture is standing out in space. Any grain on the surface of the paper will appear to float as a haze in front of the picture, therefore the most suitable surface is evidently a highly enamelled gelatine print. The examples I show to-night are printed on Solio paper, and toned with platinum, which gives a pleasant brown of varying depth somewhat after the shades of brown found in carbon tissue. Tone is, of course, a matter of taste, but both in prints and transparencies warm tones seem more natural than blacks or purples.

Trimming prints for stereograms requires care and some little thought—but although the directions may sound a little puzzling, a single trial enables the worker to see the requirements clearly.

If the prints are from single quarter-plate negatives they must be marked on the back when filling the printing frames so that the right and left hand prints can be distinguished. They are trimmed to a common base line and to a common height—according to subject—as the height is only limited by what the stereoscope will take in. The width, however, is more important. Our eyes do not exceed three inches apart, and do not even reach that except in rare cases. The average is probably $2\frac{3}{4}$ inches. Now, as the axes of the eyes when

directed towards a distant object—and consequently parallel—are only $2\frac{3}{4}$ inches apart, it is evident that if the photographs are to be seen under similar conditions the two images of the distant object should also be only $2\frac{3}{4}$ inches apart on the mount. This limits the width of the print to $2\frac{3}{4}$ inches. The construction of the stereoscope, however, as I shall shortly show, allows this width to be exceeded a little if necessary to include the desired picture, but the maximum width should never exceed 5 inches, and $2\frac{3}{4}$ is better.

A stereogram which is just a little too widely mounted may be seen clearly enough, but will in most people cause a sense of strain or fatigue in the eyes, which detracts from the pleasure which the practice might otherwise give.

In trimming stereo prints a pleasing effect will be produced if they are so cut that the inner edges of the prints show a trifle more of the picture than the outer, or, in other words, some object or detail should be seen at the inner edge of each picture which is not seen at the outer edge of the other. This has the effect of throwing the image apparently behind the mount, which thus looks like a frame. The reason of this will appear if one looks out of a window at the outside view with each eye alternately, when it will be noticed that each eye sees a little of the view that the other does not see. By reproducing this condition in the stereogram in relation to its mount, we get the impression that the picture is beyond the mount just as the view is beyond the window. In practice it will be found that this condition will be fulfilled if some object in the extreme foreground is kept at the same distance from the edge in each print. The different positions of foreground and distance in the two prints are such that, if the prints are symmetrical with regard to a foreground object, they cannot be so with regard to a distant object. This method of trimming prints is a refinement merely, and not vital to stereoscopic effect; it is difficult to explain in words, but very easily seen in the marked print which I now show you.

When the two stereo negatives are on one plate the prints must be separated and transposed from right to left. The necessity for this is more easily shown than described in words. The two negatives are each independently reversed when looked at from the film side. If now a print is taken on a piece of paper of sufficient width to hold both pictures, on lifting off the print to look at it one of the halves will be carried right over the other, and the right hand one will now be to the left of the other. If the paper is divided down the middle, however, the prints can be turned over independently, hence the necessity for cutting and transposing.

I have had so much to say about trimming prints that I fear I may have created an impression that there is a lot of trouble about it. In practice, however, it will be found that there is merely the trouble of trimming two prints instead of one, and surely, if a print of any kind is worth trimming at all, it is worth a little care.

For mounting, cabinet mounts do well for subjects which allow a height of about four inches, while for square pictures the ordinary stereo mounts will do. The prints should be accurately in line at their bases, and should be separated by a space of about one-eighth inch.

The finest effects are undoubtedly to be seen in glass transparencies, the great range of gradation and the wealth of detail obtainable in these being particularly useful. Obviously to cut and transpose the glass in the same manner as paper prints would be troublesome and tedious, but by printing either end separately—transposing the negative and plate at each operation—the same end is gained, and I propose to demonstrate this process to you at the close of the paper.

Transparencies can also be made by copying the negative in the camera on a transparency plate. In this case no transposing is necessary, as each negative is reversed by the lens, and appears in its proper position. I regret that I cannot speak from experience as to this method, because it practically involves working by daylight, and I have found the operations of negative making, printing, and enlarging fully sufficient to occupy all the daylight hours I can devote to photography. Therefore I prefer to reserve transparency work for winter evenings, and probably most people will agree with me. Glass transparencies should be backed with a translucent medium to cut off the view of objects lying behind. Ground glass is often used, but for my part I prefer plain glass coated with an emulsion of white lead in collodion, as suggested by the editor of THE BRITISH JOURNAL OF PHOTOGRAPHY. It can be made of any degree of opacity, and shows no grain. When the subject is such that reversal does not matter, the coating may conveniently be on the cover glass, but in landscapes the cover glass should be transparent, and the coated glass can be placed temporarily behind in the stereoscope.

WILLIAM GOODWIN.

THE HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Annual Exhibition of the Hackney Photographic Society was held at the Morley Hall, Hackney, N.E., on November 21, 22, and 23. At the conclusion of the show, the medals, &c., were presented by the Viscount Horncastle, the first Mayor of Hackney.

We always look forward with pleasurable expectation to our annual

visit to the Hackney Society's Exhibition. Our visit is paid some hours before the public are admitted, but we invariably find the arrangements are complete as far as the work of the Society's officials is concerned. When we mention that at the present exhibition there were 373 frames, a larger number than were included in the pictorial section of this year's R.P.S. Exhibition, that many of the pictures have to be unpacked from cases, and all of them have to be fitted with rings or plates and numbered according to the catalogue, that they have to be arranged and hung on the walls, besides other incidental work, it will be conceded that the task the Exhibition Committee undertake is one of some magnitude. We understand that for several years past the whole of this work has been performed in one day, and that before the hall is locked up for the night the last picture has been hung, and, as far as the display of the photographs is concerned, everything has been complete. That such a thing is possible points to an admirable system of organisation, and it is only fair that we should render a tribute of praise to those to whom it is due.

In the quality of the work shown a very fair advance has been made since last year's show, and it was a noticeable feature that the walls, glancing at them from a central position, looked more harmonious. It was not that any difference had been made in the arrangement of the pictures, but was due partly to the increased average size of the frames and the less number of small frames which, however arranged, are apt to make the walls look spotty, and partly to the entire absence, at any rate on the members' side, of those bright-coloured mounts and gaudy mountings which used to be so beloved of the inexperienced exhibitor. While referring to the framing of the junior members' work in this laudatory way, we should also say an appreciative word as to the general improvement that has taken place in the work itself. Of course, the difference between the work of the most skilful and the least skilful of the Society's members is immense, but this difference was not accentuated in the present exhibition by the presence of photographs showing utter want, not only of skill, but of care. Indeed, there were few exhibits without some meritorious points. That the average quality of the work was so high is the more remarkable from the fact that out of 130 members of the Society no less than 41, that is to say nearly one-third, were exhibitors.

But, while we congratulate the Society upon its general progress, we must once more repeat our warning as to the danger it runs of losing its well-earned position by its persistent neglect of portraiture and figure subjects. That a Society which contains the talent that the Hackney Society does should be content to show about a dozen pictures of this class as representing a year's work is unaccountable and lamentable. The signs of the times all point to an increasing interest being taken in portraiture and figures. Our country has easily maintained its position in the pictorial rendering of landscapes, but we are being strongly assailed from abroad in a branch of photography which we have unduly neglected, and in which the pictorial possibilities are infinite. We look to societies like the Hackney to keep us from lagging behind our competitors.

The judges appointed were Messrs. Craig Annan, F. Hollyer, and J. C. S. Mummery. Mr. Hollyer, however, did not act. In the Members' Classes, portraiture and figures were classed with animal studies. Of the former, as we have said, the number of exhibits was small, and the judges did not distinguish any of them with an award. W. A. I. Hensler had a portrait of a lady at a window which was sufficiently good to encourage him to further work in this direction. Mr. Hensler looks upon himself, we believe, quite as a beginner in this class of work, and he naturally fell into some of the mistakes a beginner encounters in the treatment of such a subject. Many of these he will, no doubt, see for himself and rectify in future attempts. Mr. Rawlings had a good rustic figure in "The Wood Gatherer," and he, again, obviously owes his want of success to inexperience. The striking fault in this was the want of relief of the figure against the background. A. Glass made a rather ambitious subject in a nude half-length figure of a girl entitled "Meditation." There was nothing whatever offensive about its nudity, but, pictorially, it would have been very much better had the figure been draped. The animal studies were mostly of animals and birds in the Zoo, and were obviously in many cases enlargements from smaller negatives. It was a remarkably good class as a whole, and many of the exhibits deserved almost extravagant praise. This, the judges evidently recognised, as each of the principal exhibitors received an award. They were Messrs. J. O. Grant, W. Selfe, A. Rose, and F. E. Roofe. We should also say a good word, too, for the dog studies of L. S. Wilks, whose work has very much improved.

The Architectural Class was not a very large one, but it contained a fair proportion of really good work. It would be difficult to imagine anything better than W. Rawlings' "The Triforium, Gloucester," and, though it required closer examination to see its beauties, "The Cloisters, Wells," by the same artist, pleased us almost as well. "Founder's Tomb, St. Bartholomew's," by G. W. Haslam, "Cloister. Fountains Abbey," by W. A. I. Hensler, and "Staircase, London University," by S. C. Stean, were also notable among the interiors. The last-mentioned deserved special recognition on account of the skill dis-

played in producing a harmonious result in a subject that required the use of magnesium to supplement daylight. We noticed several examples of a class of subject which should be more frequently attempted. The titles "A Street in St. Ives, Cornwall," by Dr. Roland Smith, "A Quaint Corner, Hawkshead," by W. A. I. Hensler, and "At the Base of the Monument," by W. Selfe, will explain the kind of thing to which we refer.

The Landscape, Seascapes, and River Scenery Class, as usual, attracted the largest number of exhibits, the number of frames being more than equal to the aggregate of those in the other members' classes. We noticed with satisfaction that there was a greater variety than last year in the choice of subjects, and also in methods of treatment. Of course, the Hackney Society made its reputation in the scenery of the forest, marsh, and mudflat. There was quite sufficient of it in the exhibition to satisfy tradition, and there remains still a noticeable tendency to impart to whatever scene is attempted a sense of dreariness and melancholy. This is, perhaps, the more noticeable, as it appears particularly in the most important part of the work. The gold medal for the best picture on the members' side was awarded to W. Rawlings for "A Snow-bound Harbour," a picture which required some study before its merit could be realised. There is no doubt, however, that those who would take the trouble to examine it and get in sympathy with the subject would endorse the judges' decision. Mr. Rawlings supports his reputation in his other work in the class. W. A. I. Hensler had in "The Mill Stream," which received the silver medal of the class, a subject of a different kind from what he usually attempts, a mill stream, not of the rural kind, but such as may frequently be found in the manufacturing districts of Yorkshire, bordered with buildings, picturesque only in their irregularity. He has managed to infuse a glamour of romance into the subject by his skilful treatment of it. Among Mr. Hensler's other exhibits, which were quite up to his usual form, was a little circular blue picture entitled "Silvery Moonlight," which was unusually successful for a thing of the kind. E. J. Hunt's "On the Heath" contained a tenderly rendered atmospheric effect. It was awarded the bronze medal. The pictures which received certificates were "Temple Stairs, Thames Embankment," by H. W. Jane, which visitors to the recent R.P.S. Exhibition will perhaps remember. "The Path through the Woods," by J. J. Westcott, a very pleasing picture of sunlight and forest scenery. "Evening," by G. H. Capper, one of the most striking pictures in the exhibition, and "The Lady of the Forest," by J. Carpenter, quite in Mr. Carpenter's dainty style. Other exhibitors of notable work were E. Puttock, Dr. Roland Smith, W. Selfe, W. L. Barker, S. C. Stean, F. E. Roofe, J. Featherstone, and J. O. Grant.

In the Open Classes the gold medal for the best exhibit was awarded to C. H. Oakden for a very fine cathedral interior. In the class for portraits and figures the awards were: Silver medal to J. Auld for "Reverie"; bronze medal to J. Burns for "The Wind Bloweth from the Sea"; and certificate to W. Illingworth for "A Philosopher in Humble Life." The last-mentioned three pictures were all exhibited at the recent R.P.S. Exhibition. Other notable exhibitors in the class were Miss H. Padgett, J. L. Shawcross, J. W. Hodges, A. E. Lane, Graystone Bird, E. A. Price, and W. J. Shelley. Among the exhibits we noticed one or two heart-rending attempts at imitating the American school.

In the General Open Class the Society scored a distinct success in the silver medal being awarded to W. A. I. Hensler for the picture which obtained the first award in the Members' Class last year. H. W. Bennett received the bronze medal for "The entrance to the Sixteenth Century Chapel, Ely," and T. E. Freshwater, F.R.M.S., a certificate for a frame of "microphotographs" of "spiders." Among the other notable exhibitors were G. H. Gill, Dudley Hoyt, O. G. Pike, J. M. Whitehead, A. T. Ward, Mrs. K. Knapp, J. T. French, E. J. H. Felce, H. Quilter, Graystone Bird, and W. Illingworth.

The lantern slides in both the Members' and the Open Classes were neither very numerous nor of extraordinary merit. The class for stereoscopic transparencies, an open class, contained some very good work, also some very bad. It is interesting to note that the three awards were all made to members.

The trade exhibitors were Messrs. H. W. Cox, Ltd., Burroughs and Wellcome, the Doe Portable Electric Light Syndicate, Spratt Bros., R. and J. Beck, W. D. Welford, and the Rotograph Photographic Company. A silver medal for the best general exhibit was awarded to Messrs. R. and J. Beck, and a bronze medal for the best photographic novelty to the Doe Portable Lamp Syndicate for a portable electric dark room lantern.

On the evenings the exhibition was open there were concerts, lantern, and cinematograph entertainments, and other attractions for visitors.

LIST OF AWARDS.

Members' Classes.

Best Picture in Classes A to D: Gold medal, W. Rawlings. Class A: Silver medal, J. O. Grant; bronze medal, W. Selfe; certificate, F. E. Roofe; certificate, A. Rose. Class B: Silver medal, W. Rawlings; bronze medal, G. Guest. Class C: Silver medal, W. A. I.

Hensler; bronze medal, E. J. Hunt; certificates, H. W. Lane, J. Carpenter, J. J. Westcott, and G. H. Capper. Class D: Silver medal, S. C. Stean; bronze medal, not awarded. Class E: Silver medal, F. E. Rooffe; bronze medal, W. A. I. Hensler; certificate, W. Selfe.

Open Classes.

Best Picture in Classes F and G: Gold medal, C. H. Oakden. Class F: Silver medal, J. Auld; bronze medal, J. Burns; certificate, W. Illingworth. Class G: Silver medal, W. A. I. Hensler; bronze medal, H. W. Bennett; certificate, T. E. Freshwater. Class H: Silver medal, Graystone Bird; bronze medal, W. Page; certificates, E. R. Bull and Dr. Roland Smith. Class I: Silver medal, A. D. Fort; bronze medal, W. L. Barker; certificate, L. S. Wilks. Best Trade Exhibit: R. and J. Beck. Most Useful Photographic Novelty: Bronze medal, The Doe Electric Lamp.

Studio Gossip.

"OUR Youngest Constant Reader"—Mr. Crawshaw, photographer, of 2, Wellmeadow-road, Hither-green, S.E., sends us a photograph of his little son, bespectacled and pipe in hand, engaged in perusing a copy of the JOURNAL. We hope our young reader will grow into an old one, and that the JOURNAL may help him to a successful photographic career.

"A RELENTLESS Snap-shooter."—A writer in our excellent contemporary, "The Referee," describing an interview with Mr. George Alexander, the manager of the St. James's Theatre, says he found that gentleman and his company about to be photographed on the stage in their habit as they appear in Mrs. Craigie's much-debated play," and that, "in spite of his impending capture by that relentless snapshooter, Mr. Alfred Ellis, Mr. Alexander displayed an unruffled calmness." Mr. Ellis's confrères in the profession of which he is such a prominent member will surely smile at the description of him as "a relentless snapshooter."

THE Yarmouth Murder.—At Great Yarmouth, last week, in the course of the magistrates' inquiry into the murder case that is attracting so much public attention, Mr. James Richard Conyers, who for twenty-five years has photographed Yarmouth visitors on the beach, identified a beach photograph, which he said he took on the forenoon of September 20. He asked for the lady's patronage, and he remembered that she required a great deal of persuasion. Witness then gave a detailed description of the way the lady was dressed. Mr. Wiltshire, counsel for the prosecution: As an artist, you took all these things in?—Witness: Yes.

ILLUSTRATED postcards, like theatrical placards and automatic peep-shows, says the "Daily Chronicle," are all the better for the criticism of public opinion. In Austria a collection of illustrated postcards has been obtained which would not be suitable for a drawing-room table. Dr. Wach, of the Vienna criminal courts, has carefully preserved all the cards seized in the Austrian capital, two hundred in number, and other Austrian tribunals have joined him in this interesting work, sending each its contingent of scandalous designs. Dr. Wach has made an album of the whole collection, which the Government has photographically reproduced, sending copies to all the provincial courts.

TANQUEREY in Glasgow.—His lavish distribution of circulars has already justified the faith of M. Tanquerey that wherever there is an aggregation of men and women there are certain to be a proportion waiting to be taken in by the wiles of the first deceiver. The Glasgow press is now devoting space to the wailings of the victims of his promise to give "portraits for nothing." It is the old, old story of a photograph sent to Paris, followed by a note stating that "one of the finest crayon portraits it is possible to produce, and at the same time a perfect likeness," has been completed; and that, thinking "a handsome frame might be wanted," a catalogue was enclosed. A frame, including boxing, packing, &c., was ordered at a cost of £1 4s. The receipt of the money was acknowledged, and the portrait promised in thirty days. By and by the portrait arrived, with 4s. to pay for carriage. Delivery was refused, but, repenting, the box was given up on payment of an additional 1s. 6d. Inclusive of postages, &c., the portrait and frame cost 30s., and the recipient's testimonial is thus expressed:—"The frame is execrable rubbish, and the portrait an exceedingly coarse, inartistic production—the two together not worth 10s.; while the easel promised to every purchaser of a frame was not sent." This is typical of the complaints of M. Tanquerey's simple-minded victims, but a solitary letter has appeared setting forth that the writer has received a beautiful crayon portrait on remitting 8s., and was so pleased with it that he got another on the same terms. We have no quarrel with M. Tanquerey so long as he trades in a legitimate fashion, even though his portraits may not be the high-class works of art he sets forth they are; but, in face of the payments of 8s., where does his offer of "portraits for nothing" come in? The eight shillings, the champion of Tanquerey admits, was not spent in carriage, &c., as he says the portraits were sent in pasteboard tubes, and that the postage was trifling.

News and Notes.

THE proposal to erect a National Physical Laboratory in the Old Deer Park at Richmond has been abandoned.

The Brentford Photographic Society's Annual Social Evening will be held on Wednesday, January 2, 1901, at eight p.m., in the Large Hall, Public Baths.

The Leyland Photographic and Scientific Society has lately been formed. Mr. James Iddon is President, and the Hon. Secretary is Mr. J. Lomax, Westby Cottage, Leyland.

ROYAL Photographic Society.—Lantern meeting, Tuesday, December 4, at 66, Russell-square, W.C., at 8 p.m. "Lantern Slides, Pastoral and Sundry," by Colonel J. Gale.

HOVE Camera Club Exhibition.—The following is the list of the judges' awards in the open classes: Challenge Salver, Douglas English, "Fantaisie Americaine," No. 306. Class A (Landscape and Marine)—Silver medal, E. R. Collins, No. 41; bronze medal, W. H. Rogers, No. 32; certificates, R. C. Foskett, No. 60, C. Berrington Stoner, No. 34. Class B (Figure and Portraiture)—Silver medal, C. W. Walker, No. 93; bronze medal, H. Lawrence, No. 107; certificate, Percy Lankester, No. 111. Class C (Architecture)—Silver medal, E. J. H. Felce, No. 138; bronze medal, A. J. Loughton, No. 135; certificates, Chas. H. Ookden, No. 139, C. W. Walker, No. 131, F. J. Walker, No. 120. Class D (any other subject than classes A, B, and C)—Silver medal, Douglas English; bronze medal, Miss MacLachlan, No. 150; certificate, J. M. Whitehead, No. 158; special certificate, Douglas English, No. 169.

THE Trade Journal.—The trade journal, says the "Age of Steel," is not a newspaper, as the term is generally understood. It is strictly business. It is a purveyor of industrial information, and of all things related thereto. Every class of industry has its representative paper. The shoemaker, the boilermaker, and the candlestick-maker; the cotton-spinner, the glass manufacturer, the architect, and the engineer; the man who handles jewellery; and he who makes pig iron, tin plates, or horseshoes, and all the way along the line from a pocket-knife to a locomotive, can put his finger on what he wants to know in his particular trade journal, as easily as he puts on his gloves or his hat. Nothing can take the place of the trade paper in this matter. The average newspaper has neither room nor inducement to specialise on strictly technical matters. The general public demands something more savoury and sensational, and has no direct interest in what is being done in a machine shop or a shipyard. The taste for spiced viands has to be gratified, and a yacht race or a prize fight, a sensational crime or a malodorous scandal, is a raker in of shekels and a feeder of popular patronage. The trade journal is not a garden of garlic, or a laundry for politicians, and its patrons are restricted to industrial circles. In this lies its special virtue. It has one object and it sticks to it. If a manufacturer wants a machine or mechanic, or latest improved tool, he has but to consult his trade journal to get in its pages what he cannot get elsewhere. He can make his comparisons of costs and efficiency, can place his orders at the price of a postage stamp, and with a pen or a typewriter can in a few minutes make and close important transactions. It is the trade journal that makes this possible. Otherwise the sales agent or the vagrant circular, and a mail-bag of inquiries would be the time-eating and money-eating conditions of locating a manufacturer, and getting a full text of his specialities. It is this feature of the trade journal that makes it the best advertising medium of modern times. It brings buyer and seller in closer contact. The arrow goes straight to the mark. If a pump is needed, or a windlass, a lathe, or a drop hammer, an anvil, or an iron bridge, the advertising of the same in the trade journal is frequently the only up-to-date directory of places and persons where such can be had. It goes without the telling that most of the sales of machinery, tools, and related equipment, are brought about by advertising literature in trade journalism. This fact in many instances ought to be more appreciated than it sometimes is, at the selling end of modern business.

Commercial & Legal Intelligence.

CHANGE of Address.—Mr. H. F. Purser informs us that in future his business and its connections with the Rathenower Optische Industrie Anstalt (late Emil Busch) and the Busch Camera Company will be carried on at 31, Hatton-garden, London, E.C.

CHRISTMAS Cards on Thick Bromide Paper.—Messrs. Wellington and Ward, of Elstree, Herts, are issuing a special thick bromide paper ($\frac{2}{3}$ times the weight of the smooth or rough grade) for use when prints are not required to be mounted, and therefore suitable for Christmas.

THE Objectionable Poster at Manchester.—Mr. Arthur Collins, of the Theatre Royal, Drury-lane, sent the following letter to the Editor of the "Manchester Courier" for publication in that journal:—"I have refrained from writing to you with regard to the action of the Manchester police in respect to a poster exhibited by the manager of the Theatre Royal, where 'Hearts Are Trumps' was being played, in case your readers should imagine that I was seeking advertisement. As, however, the Drury-lane Company have left Manchester, it will be obvious that I am not seeking publicity in expressing my surprise at the action of the Chief Constable. The poster in question has been exhibited for months in London and various large towns without exciting any remark as to its impropriety from any section of society, whether playgoers or not, and the course pursued by the Watch Committee, as represented by the Chief Constable, is the more surprising, and quite on a par with their attitude towards the manager of the Comedy Theatre. I have always been under the impression that Manchester was one of the artistic centres

of the provinces, but, after this display of puritanical priggishness, I am afraid that it will sink considerably in my estimation. As to the action of Mr. Courtneidge in his haste to fall in with the view of the Chief Constable, I may remark that he was under the impression that the poster referred to was that of the Academy picture, which, being a representation of a semi-nude figure, might possibly have offended this Mr. Stiggins of a constable. Believing that it was the "Wood Nymph" poster objected to, he gave orders for its withdrawal. Had Mr. Courtneidge known, as we do now, that it was the very harmless poster representing a scene in a photographic studio, he would doubtless have told the Chief Constable to mind his own business."

LORD Rosebery on American and German Competition.—In the course of his recent Rectorial address at Glasgow University, Lord Rosebery observed: The United States Consul at Chemnitz has remarked that, "If an industry in Germany languishes, immediately a commission inquires into the causes and recommends remedial measures, among which usually is the advice to establish technical or industrial schools, devoted to the branch of business under consideration." In a word, they go to the root, to the principle, to the source. This is thoroughness, this is the scientific method applied to manufacture, and we see its success. The Americans, I gather, have hitherto applied themselves rather less to the principles than to the applications of science. I do not pretend to say which are right. The Germans are alarmed at the development of American commerce, and we are alarmed at both. At any rate, both in Germany and the United States you see an expenditure and a systematic devotion to commercial, and technical, and scientific training. I know that much is done, too, in Great Britain. But I doubt if even that is carried out in the same methodical way; nor is there anything like the same lavish, though well-considered, expenditure. It always seems to me as if in Germany nothing, and in Britain everything, is left to chance. It has been said that the true University of our days is a collection of books. What if a future philosopher shall say that the best University is a workshop? And yet the latter definition bids fair to be the sounder of the two. The training of our schools and colleges must daily become more and more the training for action, for practical purpose. Are there not thousands of lads to-day plodding away, or supposed to be plodding away, at the ancient classics who will never make anything of those classics, and who, at the first possible moment, will cast them into space, never to reopen them? Think of the wasted time that that implies; not all wasted, perhaps, for something may have been gained in power of application, but entirely wasted so far as available knowledge is concerned. And if you consider, as you will have to consider in the stress of competition, that the time and energy of her citizens is part of the capital of the commonwealth, all those wasted years represent a dead loss to the Empire. If, then, these recent events and the present conditions of the world induce thinkers and leaders in this country to test our strength and methods for the great struggle before us, they must reckon the training of man. On that, under Providence, depends the future, and the immediate future, of the race; and what is Empire but the predominance of race?

BROMIDE Prints in lieu of Platinotypes.—At Marylebone County Court, last Friday, before Judge Stonor, Mr. Francis John Tilly, photographer, 45, Donaldson-road, Bordesbury, N.W., brought an action for the recovery of seven guineas from Mr. A. P. J. Boland, 40, Priory-road, West Hampstead, N.W., the claim being in respect of silver, platinotype, and bromide photographs said to have been supplied to order. Mr. J. Heath, solicitor, appeared for the plaintiff, and Mr. Calfax, solicitor, defended.—The plaintiff stated that in August last he received orders from the defendant for certain silver and platinotype photographs. These were supplied, and their price, £1 19s., was duly paid. Shortly afterwards he received further orders for large platinotype groups and cabinets of single figures taken from the large negatives. He explained that these would be rather expensive, particularly as the background of the cabinets would have to be put in by hand. The defendant's reply, however, was that he did not mind the expense so long as a satisfactory job was made. Three proofs were submitted and approved, and the order was then executed. The defendant retained the photographs for seven weeks, but when pressed for payment he sent some of the prints back, and complained that the charges were excessive.—The Judge: I see you charge 10s. for the platinotype groups, 10s. 6d. each for the panels, and the groups of servants, and 4s. each for the 21 cabinets.—Mr. Calfax (cross-examining): The cabinets, as well as the large prints, were to be done by the platinotype process, were they not?—The Plaintiff: Yes.—Do you know how to distinguish between platinotype and bromide prints?—The only test is by examining the surface, at least I know of no other way.—Have you never heard of the bichloride of mercury test?—There may be such a test, but I never heard of it.—Do you mean to say that the small prints were done by the same process as the large one?—They may not be quite exactly the same, but they are identical as regards appearance. I could not have done them by any better process at the price.—Mr. William Hilder, photographic printer to the trade, said that he printed the larger photographs for the plaintiff by the platinotype process. The smaller ones were bromide prints. There was not much difference between platinotypes and bromides in appearance, but the bromides, having a gelatine surface, became sticky on being wetted, whereas the platinotypes were not so affected when dampened. That was the simplest test. Considering the artistic skill required for putting in a new background to the cabinets, he did not think that the plaintiff's charges were excessive.—The defendant maintained that he ordered platinotypes and not bromide prints; moreover, he denied receiving all the prints enumerated in the account. His chief com-

plaint, however, was that he had not been supplied with the kind of photographs which he ordered.—Counsel for the defence submitted that by the plaintiff supplying bromides when platinotypes were ordered, he vitiated the whole contract, and so could not recover.—Solicitor for the plaintiff contended that the evidence went to show that at least the larger prints were platinotypes, as ordered by the defendant, and that the cabinets were, to all intents and purposes, just the same.—The Judge: Goods supplied "to all intents and purposes" the same as those ordered does not, in the general way at least, mean a proper performance of the contract. I find for the plaintiff for three guineas only—for the goods which were in accordance with the order.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
3.....	Doncaster	Beautiful Britain. R. S. Wright.
4.....	Gospel Oak	New Kodaks. W. J. Ramsey.
4.....	Newcastle-on-Tyne	Lanternist's Night.
4.....	Rotherham	{ Negatives and Prints—their Improvement and Modification. A. Horsley Hinton.
5.....	Croydon Camera Club	{ A New Print-out Paper. E. F. Ley.
5.....	Edinburgh Photo. Society	{ Photography in Medicine and Surgery. W. E. Carnegie Dickson, B.Sc. (Edin.).
5.....	Woodford	{ Intensification—A Comparison of Different Methods. H. W. Bennett, F.R.P.S.
6.....	Darwen	Lecture: Negatives and Prints. Bromide Printing. F. Woollons.
6.....	Hull	{ A Cruise about Europe. Dr. Joseph Jones, M.B.
6.....	Leigh	Demonstration: Ozotype, the New Carbon Printing Process without Actinometer, Transfer, or Safe Edge. Thos. Manly.
6.....	Liverpool Amateur	Lantern Night: India. Thomas E. Freshwater.
6.....	London and Provincial	Stereoscopic Fluoroscope and a New Rotary Mercury Break. J. Mackenzie Davidson, M.B.
6.....	Röntgen Society	Developers. J. S. Anderson.
7.....	Aberdeen	Instruction Evening: Trimming, Mounting, and Framing.
7.....	Borough Polytechnic	Demonstration: The Use of the Panoram and other Kodaks, Development of Kodak Films, &c. Mr. Ramsay.
7.....	Croydon Microscopical	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 22, Mr. S. Herbert Fry in the chair.—Mr. T. E. Freshwater, Acting Secretary, reported the acquisition of a new bookcase, which would enable the librarian to put the books in better order. He suggested that some of the members might find amongst their collections many duplicates of books they did not wish to keep that would be useful additions to the Association's library.

Mr. J. E. Hodd passed round two negatives developed with adurol and imogen, and typical, he thought, of the results given by the two developers. He then drew attention to a short paragraph in a contemporary, wherein the writer said that by opening the camera back in the full glare of daylight sufficient light is often retained by the bellows to fog a rapid plate. Mr. Hodd wondered whether the possibility of utilising bottled-up light was thus opened up.

Mr. A. Haddon remarked that almost all substances bottled up light, but the time during which such light was given out varied considerably. Some things gave it out in a fraction of a second; others retained it for a long time, giving it up but slowly. Coral took up light during the day to a considerable extent, and gave it out at night. It was, of course, possible that the material used in the bellows of the camera repeated these phenomena. Bequerel carried out many interesting experiments in this direction, and it was to them that he referred.

Mr. R. P. Drage remembered a former discussion upon the subject at another place, when the idea was thoroughly laughed down.

Mr. A. Mackie said he had recently come across a paragraph which dealt with the possibility of exposing in place of the plate a luminous painted screen. This screen was then placed in contact with a sensitive plate, the image being finally developed on the plate.

Mr. P. Everitt passed round a vitrified enamel portrait made by Mr. J. S. Teape. It had the double feature of being from a hard collodion negative and enlarged over two times.

Mr. T. E. Freshwater gave a chat upon the reflecting stereoscope. He regretted that the popularity of this instrument had so much died down, especially when one considered how, by its use, with what ease stereoscopic pictures of any size could be seen. Wheatstone was the man who designed the reflecting stereoscope. It consisted of two mirrors set at an angle of 90°, in which are received the images of the two prints of a stereoscopic pair of photographs, and from whence they are received by the eyes and combined. The advantage is that pictures of any size may be viewed, instead of those of only limited size that are possible with the ordinary stereoscope. Wheatstone's reflecting stereoscope is not usually found anywhere but in lecture theatres, &c.; but with the introduction of stereoscopic radiography, hospital authorities found in them a ready means of viewing the pictures of fractures, &c., which have been of so much help in locating the seat of injury. Mr. Fresh-

water showed several stereoscopic pictures in two stereoscopes of the reflecting principle. He referred those who desired detailed information about stereoscopic photography to the several articles that have appeared in past years in THE BRITISH JOURNAL PHOTOGRAPHIC ALMAMAC. Having replied to a number of incidental queries, he was accorded a hearty vote of thanks.

PHOTOGRAPHIC CLUB.

November 21, Mr. Charles Wallis in the chair.—Mr. J. P. W. Goodwin gave a chat on "Fred Walker, A.R.A., and his Work," illustrated by slides from many of his pictures. During the early years of photography progress was visible mainly in the direction of mechanical improvement, and its secrets—now secrets no longer—were only gained after years of patient effort. But, with all the spreading of knowledge, the ability to obtain perfect instruments, and the growth of skill in their manipulation, there still remains a vast field for conquest, known in familiar language as "pictorial photography." He refrained from discussing the possibilities of the chances of photography being numbered amongst the fine arts, but as a step in the right direction he wished to urge those desirous of improving in the knowledge of what was pictorial in photography to study the works, not of successful photographers, but of great artists. The laws of composition, the rules that govern the introduction of light and shade, must, of course, be studied, but not with the idea that they are as fixed and immutable as the multiplication tables. They were arrived at by close study of the works of the greatest artists in all ages. It is for us to examine the examples of the genius of these artists. The opportunities lie thick around us, with the national collections, the frequent exhibitions, and the numberless reproductions that—once impossible—are now to be found in periodicals and magazines. The works of Fred Walker, A.R.A., he instanced as particularly worthy of study by the pictorially-minded photographer. To whet his appetite he had come down to speak of the career of this, one of England's greatest painters. Considerable attention was given to the running commentary Mr. Goodwin made as the reproductions of the pictures were shown on the screen, and a cordial vote of thanks was passed to Mr. Goodwin for his lecture.

Mr. Wm. H. Wilkins (R. and J. Beck, Limited) showed and described the No. 8 new folding Frena camera, fitted with Beck-Steinheil two foci Orthostigmat lens. He also showed photographs made by the whole-plate form of this lens, used normally, and also on a 12 × 10 plate, with examples taken with the single components to show the rectilinearity of lines.

West London Photographic Society.—On November 23, before a large audience of members, Mr. G. F. Blackmore read a paper on the Ozotype process (this will appear in our next), and practically demonstrated its working. He also showed some very satisfactory prints made by this process. In a discussion which followed the opinion was expressed that the process was perhaps a little premature and that doubtless improvements would be forthcoming.

Adys-road Evening Continuation School, East Dulwich.—Wednesday, November 21. Mr. J. T. French gave a demonstration on enlarging to the members of the Photographic Class of this school. The class much appreciated Mr. French's work, and the home-made apparatus with which he did some capital enlarging, was much admired. Mr. G. G. Lewis, the responsible teacher, proposed a vote of thanks, which was carried with acclamation.

North Middlesex Photographic Society.—November 19. Mr. A. G. Lawson in the chair.—Mr. R. E. Rawkins gave a lecture on "Lantern Slides." The lecturer showed by means of the lantern what sort of negatives were suitable for the process, and slides from them. He also showed the effects of bleaching with mercury and blackening with various substances to get various tones. The uses of ferricyanide of potash and hypo as a reducer, to clear away fog, lightening distances, and modifying the gradation in the foreground were also illustrated and explained. He thoroughly explained all the details of the process, both by contact and reducing in the camera, illustrating the apparatus required. To sum up, the lecturer said that to get good results in lantern slides he recommended sticking to one plate and one developer. Evenness of work resulted, and much less waste than if they were constantly changed.

Croydon Camera Club.—Mr. Walter D. Welford drew a capital audience on Wednesday, 21st inst., when he lectured on the Glassoline film. He began with a humorous comparison of Films v. Plates, and, although this part of the subject is getting threadbare, his illustrations proved very entertaining. Indeed, entertaining very fitly describes the greater part of the lecture and demonstration. If one can manage to amuse, it, in our days, goes a very long way, particularly with amateurs, who do not care to "overlay with toil their pleasure." One thing about Mr. Welford, in his advocacy of the Thornton film, is that he did not try to prove much too much. Its chief claims appear to be that it is light, lies flat in the developer, any reducer can be used, density is easily judged, it can be enlarged by stripping it from its support before drying, and, greatest of all, it is as cheap as glass plates. Has it any drawbacks? Has anything without a drawback been invented? Those who were present judged for themselves whether the advantages of this ingenious film outweighed its shortcomings. Anyhow, as the President observed, it is a very convenient material for producing those photographic monstrosities known as composite negatives, by sticking bits of one film negative upon parts of another, when something which is neither truth, beauty, nor art may result. Quite an interesting little discussion

ensued, in which leading parts were taken by Messrs. Kough, Salt, Rogers, Stanley, Isaac, Wratten, and Edwards. The latter considered that hypo used in a developer produced relative increase of density, and was particularly useful—when pyro is not employed—for both negatives and positives, bromide paper and slides, where an increase of brilliancy and a shortening of time of development is required. Mr. Isaac supported the contention. The power of a very weak solution of hypo to dissolve silver salt was questioned, Mr. Salt opining that there was no limit to the dilution, but that a weak solution meant a proportionately small amount of silver dissolved out. Others contended that the amount of silver present in a dry plate is so small that a 1,000 per cent. solution of hypo in a few ounces of water is more than enough to combine with all the salt present in the plate, but that a certain strength of hypo is needful in order to set up the action. From the evening's proceedings it would seem that the photographic plate is undergoing much change. Having got rid of the glass, it now appears that we are in a fair way of getting rid of the silver in the film and of the reducer in the developer, so that a time may be at hand when nothing but gelatine is exposed in the camera and nothing but hypo used to bring out the image. Mr. S. H. Wratten, however, brought the meeting back to a prosaic attitude when he deprecated the objectless meddling with reducing solutions by adding hypo, whereby apparently only unforeseen results followed.

Glasgow and West of Scotland Amateur Photographic Association.—The monthly meeting was held in the rooms of the Association, West Regent-street, on the evening of the 18th inst., Mr. Thos. W. Robertson in the chair. Four new members were admitted. Mr. W. J. B. Halley, Hon. Treasurer, submitted his financial statement for the year, showing that the Association was only £6 down as compared with the balance in hand a year ago, although there had been extraordinary expenditure to the amount of £25 during the year. The balance in their favour was £483 16s. 10d., and of the arrears of subscriptions £15 might be reckoned as good. The Association's assets stand in the books at £213 4s. 9d., so that the members have every reason to be proud of the financial condition of the Association. A hearty vote of thanks was accorded to Mr. Halley for his devotion to his duties. Mr. J. C. Oliver then gave a demonstration of the Venus and Verel Khaki printing-out papers, pointing out the superior qualities they possessed for pictorial purposes over those of P.O.P. For his part, he preferred the tones they gave without further toning, but he sent round prints toned with gold and platinum, according to the makers' formulæ. He found a great saving of time effected in using these papers, as they printed faster, toned quicker, required briefer washing, and dried quite flat when laid on blotting-paper. His best results were obtained with dense negatives, thin negatives being of no use. Mr. J. Imbrie Fraser followed with a demonstration of platinotype printing and developing by the hot and cold bath processes, after which Mr. William Goodwin, Hon. Secretary, explained how to salt such a paper as Whatman's drawing with a size made of arrowroot and chloride of ammonia, sensitising it with nitrate of silver to produce a printing paper capable of giving a very pleasing tone with platinum at no very great outlay. Votes of thanks were given to the demonstrators.

Blaigowrie and District Photographic Association.—The monthly meeting of this society was held in the Club-room, Blaigowrie, on November 20, when the President (Mr. A. Geekie) gave his annual address. It was unanimously agreed, on the motion of Mr. J. B. MacLachlan, seconded by Mr. D. G. Monair, to affiliate with the Royal Photographic Society, and the Secretary was instructed accordingly. A report was given apon the forthcoming Exhibition in January, which showed that numerous inquiries had been received for prospectuses during the past week, besides many inquiries from England, Scotland, and Ireland, a large number of inquiries had been received from France, also from Italy and Austria. Entertainments are to be held every night the exhibition is open, and altogether a record show is prophesied.

Patent News.

The following applications for Patents were made between November 12 and November 17, 1900:—

- DISHES.—No. 20,310. "Improvements in Dishes employed in Photography and for like Purposes." T. C. TWINING.
- LENS.—No. 20,349. "Improvements in and relating to Photographic Objectives." H. MEYER.
- CINEMATOGRAPHS.—No. 20,457. "Improvements in or connected with Cinematographs." A. WRENCH.
- PLATE-HOLDERS.—No. 20,511. "Improvements in Photographic Plate-holders." Communicated by A. Gaffney. Complete specification. P. M. JUSTICE.
- LANTERNS.—No. 20,738. "Improvements in Magic Lanterns." A. G. MANIFOLD.
- ROLL-CAMERAS.—No. 20,776. "Improved Roll-camera." Complete specification. J. A. PAUTASSO.
- COLOUR PHOTOGRAPHY.—No. 20,788. "Improvements in Devices for the Simultaneous Production of several Photographic Pictures for Use in Colour Photography and the like." C. H. E. A. MIETHE.
- COLOUR PHOTOGRAPHY.—No. 20,789. "An Improved Process for Projecting Multi-colour Photographs and Apparatus therefor." C. H. E. A. MIETHE.

FORTHCOMING EXHIBITIONS.

1901.
 January 14-19 Blairgowrie and District Photographic Association.
 The Hon. Secretaries, Blairgowrie, N.B.
 February 16-March 9 Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 10a, George-street, Edinburgh.

Correspondence.

* * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * * We do not undertake responsibility for the opinions expressed by our correspondents.

COLOUR SCREENS ON SHUTTERS.

To the Editors.

GENTLEMEN,—With reference to your note on Mr. Purser's letter in THE BRITISH JOURNAL OF PHOTOGRAPHY of Nov. 23, allow me to explain that the arrangement which I showed you originated in an attempt to attach a yellow glass temporarily, so that no change should be required in lens or any other part which could not be cancelled. Having satisfied myself that the addition was useful, I proceeded to get it made in a permanent form. It is not the place of the screen which seems to me the improvement (for that is not of much importance), but the fact that the plan I have adopted allows the screens to be put on, changed or removed at will without disturbing the camera, or shaking it; it also allows an experimenter to insert any piece of glass (not too thick) for trial if he cuts it to a rectangular form of the proper width, all necessity for mountings, cells, &c., is done away with, and any form of lens can be used: my own is a Cooke, which would not allow of the arrangement mentioned by Mr. Purser.

In order to allow of the use of glass of different thicknesses, it would be desirable not to make the receptacle too shallow (the maker of mine has not attended to this part of my instructions), for there can be no harm from a slight looseness; no one would shake the camera while exposing.—I am, yours, &c.,

J. F. TENNANT.

November 23, 1900.

ARTISTS, PAINTING, BUSINESS, AND INDIVIDUALITY.

To the Editors.

GENTLEMEN,—Having to call on photographers about enlargements and paintings, the writer has often been struck with the disproportion between the show of specimens that is made and the small number of orders resulting, and the general complaint is that "People do not seem inclined to spend their money on such things"—that is, they will not go beyond a very moderate sum when paying for them. Perhaps it would be worth while to seek the cause of such a state of things, and, if possible, to find a remedy. It does not appear, according to experience, that the public have ceased to care for large portraits in monochrome or colours, or miniatures, but rather that for anything beyond an enlargement merely "finished," which can be obtained of sufficient quality to satisfy a certain class of customers at an extremely low price, the photographic "art" production has fallen somewhat into disrepute, whilst fashionable painters of oil portraits, pastellists, and miniaturists have little need to echo the art-photographers' bitter cry, the most celebrated among them being literally besieged, and having commissions booked years in advance. Yet, it may be more than suspected, photography—that Cinderella of the arts—is frequently their useful but ill-thanked and often unacknowledged handmaid. Now, there are two widely different reasons why people with something more than a guinea or two to spend on a portrait for the walls, or a miniature case, hesitate to give their commissions to a photographer. The first is, they are not sure of intrinsic value and satisfaction as to the likeness; the other reason being that, even if satisfactory in the above respects, there is no éclat in possessing a work of art other than a purely photographic one that has been turned out by a photographic establishment. The fact is, people want to be able to mention the name of the artist, and in this respect the humblest and least-known outsider of the "painter" order has a decided advantage over the most distinguished photographer, whose great disadvantage is precisely that he is unknown to the public; and the wise photographer, with more prudence than vanity, therefore will recognise his position

and whereabouts his own bread might be buttered. For the cheap enlargement "finished" by hand, or with the aerograph, nothing need be done; as already admitted, it is good in its way, and suits a client of modest means or ordinary taste. The question is, "How to attract the bigger fish?" and the following suggestions, like the foregoing remarks, being perfectly candid and sincere, it is hoped they will be taken in the spirit in which they are offered.

There should be good faith and good value. Do not take an order from a specimen done by one artist and let it be executed by another, and, furthermore, instead of expecting an egregious profit, be content with a reasonable one, apportioning to the colouring or other artistic work a sum that will admit of a good artist bestowing proper time and pains on the work. When much is done to a photograph the danger of losing the likeness is great. To avoid this the artist must be really competent, and, besides, must have every facility of communicating with the client, and of taking sittings when possible.

Now comes the miniature on ivory, the pastel, and the oil-painting: in each case pure and genuine paintings without photographic base whatever, and signed with the name of the actual artist. Why should not the acute and businesslike photographer take advantage of the fact that he has a clientèle and the clichés to supply the demand which there really is for such things? He has only to sacrifice his own name in the matter, and secure the continual or exclusive services of the artist by a simple agreement, at the expiration of which supposing a renewal to be unfeasible, he will at least have had the satisfaction of pocketing some honestly gained coin, and of having helped to bring out to the light of day, and helped on the road to success, some rising talent, and possibly even some genius.—I am, yours, &c..

INDICATOR.

AMERICAN PHOTOGRAPHY AT RUSSELL-SQUARE.

To the Editors.

GENTLEMEN,—Allow me to correct a few of the misstatements that have appeared in your JOURNAL (October 26) in an article entitled "Plastic Psychological Syntheses at Russell-square."

I am neither an "obsequious disciple" of Mr. Day, nor the scribe of the "new school of American photography;" on the contrary, the pictorial photographers mentioned are nearly all my bitter enemies, and would not even admit me to the sanctity of their studios, as the eulogies I have written about them did not seem to them half laudatory enough. I have always fought for photography "pure and simple," photographic work that depends largely on the camera, the chemicals, and the work that depends largely on the camera. If the writer of your article were in any way familiar with my writings in the "Photographic Times," "The Camera Notes," and various other magazines, he would know that I am a fanatic on that question, even to that extent that my articles, "What is Legitimate," and "J. T. Keiley, a-Japanesque Photographer," in which I brandished him as a freak, were refused by the editors of the "Camera Notes" and "Photographic Times." They all saw something in Keiley which I failed to see.

As for my "oleaginous admiration" (I have no fault to find with the expression), well, I think, a magazine article should, first of all, be interesting, it should be read by a layman, and this cannot be accomplished by restricting oneself to dry technical analysis. I have written about photographers in the same way as I have written about pictures, and, although it seemed to me ridiculous at times to apply terms to a Eugene or a Kasebier, which would be more adequate in an analysis of a Whistler or Sargent, I did it in order to help "artistic photography," and my work has not been in vain. Their names have become better known to the public at large, and their work has found appreciation more readily than hitherto.

I admire Mr. Day. I consider Day and Stieglitz the only two men in America that are worthy to be considered seriously by an art critic. I praised (perhaps too lavishly) what I considered praiseworthy in his work, and there my connection with the new school of American photography came to an end. I am also astonished that the writer of your article did not perceive the slight vein of sarcasm which runs through my whole article on Day. In New York it was also received in that spirit.

I was attracted to "artistic photography" because I learnt to admire the sincerity and unselfishness, the patience and perseverance, which certain men like Stieglitz, Day, and even Keiley applied to their vocation. They merely worked for the sake of working, of advancing the artistic side of photography, and with no other aim in view, a quality rarely met with in modern art. Kasebier, Ben Yusuf, and Eugene, on the other hand, are strictly mercenary, and I have said so whenever I had the opportunity. If Mr. Day is willing to enter their ranks—he has probably good reasons to do so—it is none of my affair; nevertheless, I would like to remark that it has not been my habit to write advertising articles; I have left that to press-agents.

As for the assertion that photography will never be ranked as a fine art, that is merely a matter of opinion. I have claimed for it, and shall continue to do so, a modest place among the graphic arts, and only in case that colour-photography (on one plate) should ever be invented, and kinetoscope photography ever artistically handled, would I claim for it the name of an independent art, as only then an element would enter its power of expression, which no other art possesses, namely, movement in pictorial representation.—I am, yours, &c.,

SADAKICHI HARTMANN.

New York, November, 1900.

[Although we last week closed our columns to any further discussion on the subject of the American Exhibition at Russell-square, we nevertheless concede to Mr. Hartmann the right of a reply to the remarks of which we made him the object, and we have much pleasure in publishing his letter. We have been diligent readers of the whole of the American photographic magazines for nearly 20 years, and nothing that Mr. Hartmann has written in them has escaped our perusal, but we must confess that we have not hitherto regarded him as a fanatical upholder of "pure" photography. Evidently we have done him an injustice, and we therefore cordially welcome him to the ranks of the "photographic" critics. The sarcasm of the article on Mr. Day was too subtle for our perception. May we suggest to Mr. Hartmann that future efforts of the kind should be labelled, in the phraseology of Artemus Ward: "This is rote sarcastick?" We must compliment Mr. Hartmann on the moderate tone of his interesting letter, which will, at any rate, amuse some photographers on both sides of the Atlantic. Eds.]

Answers to Correspondents.

* * All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

* * Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

* * Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:

V. N. Green, Trellaw, Rhondda Valley.—Photograph of Dr. K. Datta and medical staff.

C. C.—By the insertion of your letter we should lay ourselves open to an action for libel, even if the statements contained in it were true, and we have very strong doubts if they are.

SCRATCHED CINEMATOGRAPH FILMS.—G. Balmer. The "firework or lightning" appearance on the screen is due to the films being scratched in places, and there the strong light of the electric arc passes unobstructed in all its brilliancy, and produces the effect that has caused your wonderment.

MICRO-PHOTOGRAPHY.—"ENTHUSIAST" writes: "Now the long winter evenings are upon us, I thought it would be an interesting variation from lantern slide making, &c., to be able to produce those microscopical photographs seen in the ends of pencils, &c., but have no idea how to go on. I have seen no mention of it in the various publications, and see no book on it. Could you, through your most instructive paper, inform me on the process, if it is very difficult, and what kind of apparatus I require, also if I can obtain a book dealing with the subject?"—In reply: These are produced in precisely the same way as lantern slides are made from larger negatives, using, of course, a lens of much shorter focus. A suitable lens for the purpose is a low-power microscopic objective of, say, 1½ inch focus. Usually these pictures are made by the wet-collodion process, because, with that, the grain is much finer than with gelatine. No work on the subject is published.

FAULTY CAMERA.—F. Stokter says: "I have a hand camera (focussing) that I have just bought, and I cannot get the negatives sharp. I focus them sharp enough on the ground glass, but the negatives come out all out of focus. Now, can I remedy it?"—One of two things is certain. Either the dark slide or whatever holds the plates, is not in register with the focussing screen, or the lens does not work to focus. The latter is, however, scarcely probable with a modern lens. See to the camera, and have the needful done if you are not mechanic enough to do it yourself.

APPRENTICESHIP AGREEMENT.—"C. G. T." writes: "A gentleman, wishing to place his son under my care to learn the photographic business, would come to terms on three years' apprenticeship. Could you give me advice whether a black-and-white agreement is binding as to time served and other articles of agreement, without the services of a solicitor? As I am not receiving any premium, I should like to avoid all further expenses."—In reply: Yes, if properly drawn out and duly stamped. The indentures should, however, be drawn out by a solicitor, so as to make sure that they are properly done. We suppose you are aware that an apprentice is not bound to serve after he becomes twenty-one years of age.

LECTURE ON COLOUR PHOTOGRAPHY.—H. FRANKTON writes: "Might I ask your assistance in the production of a short lecture upon colour photography? I have to give one of about half an hour's length in about a fortnight, and it occurred to me that you might have something of the kind that you would give me the loan of, or, failing a complete lecture, one or two articles upon the processes invented in that direction."—In reply: In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1898 we gave a simple outline of the principal processes of colour photography. If our correspondent does not possess or cannot procure the volume, we recommend him to obtain a "Handbook of Photography in Colours" from Messrs. Marion and Co., Soho-square—unquestionably the best book of the kind yet published.

SPOTS ON PRINTS.—"MATT-COLLODION" writes: "Could you tell me the cause of spots on enclosed prints? Those two were mounted today, and spots appeared a few hours afterwards. They are collodion prints, mounted with gelatine. They were very carefully toned washed, &c., by myself. I mounted a number of same batch on gray cabinet mounts, and see no signs of spots. I am inclined to blame mounts, but will await your verdict. I have prints by the same paper which are as good as newly done after a number of years. This fault has only lately crept in."—In reply: As the spots are noticed so soon after mounting, we suspect they existed in the prints before they were mounted, and that they could have been seen had they been carefully examined. If there were any faults in the mounts, it would not affect the prints in so short a time, and the same may be said of the mountant. If that were acid, as some gelatinous are, it would not show its evil influences in a couple of hours.

LENS FOR STUDIO WORK.—"Rapid" writes: "(1) Kindly inform me of the cheapest and most suitable make of lens for instantaneous studio portrait-taking, and about the price of one to take from whole-plate downwards; also kindly inform me how in purchasing I am to ascertain whether, at a distance of twenty feet, I can take a full-length C.-D.-V. photo. My studio is well lit, and I should for instantaneous work (children) use special rapid plates; but I realise that speed rests with the lens a great deal. (2) Also the best and cheapest made burnisher (gas) for P.O.P. prints."—In reply: (1) The best lens for the purpose is the usual portrait lens. The price will vary according to the maker. Better get catalogues from different makers and see whose price suits your pocket best. Price and quality generally go together. On page 1,130 of the ALMANAC you will find a table giving the size of image, at different distances, with any focus lens. (2) It is against our rule to recommend any particular maker's goods. Better consult the advertisement columns.

COLLODION DRY PLATES.—"I. G." writes: "During the past seven or eight years we have occasionally used (for making lantern slides) the Hill-Norris dry plates; these gave great satisfaction. In my hands the results have always been really excellent, and I found the plates to possess the following special features:—(1) That almost any ordinary negative developer could be used with them. (2) They do not require any more care in handling than gelatine plates, while possessing the advantages of speedy washing, easy intensification with silver, &c. (3) That they could be obtained in varying degrees of sensitiveness. (4) The plates kept well. I have a few by me that have been kept six or seven years and do not seem to have suffered in any way. I am informed by Mr. Tylar, of Birmingham, that, owing to the limited demand, Dr. Hill-Norris has given up his plate factory and is devoting the few remaining years of his life to other work. I have heard this with much regret. Although our own use of these plates is very limited, I should have thought there would have been very many persons who would have appreciated the results obtainable on collodion plates, especially when the trouble of wet-plate work could be avoided. Could you kindly inform me (a) whether you know of any other collodion dry plates on the market possessing qualities similar to those I have mentioned. (b) Could you refer me to any special treatise or articles specially dealing with the preparation of collodion dry plates and indicating methods to be adopted to secure (1) variations in sensitiveness as required; (2) good keeping qualities; (3) a plate that will stand any ordinary gelatino-bromide plate developer, and (4) a plate that does not require special care in handling?"—In reply: If Dr. Hill-Norris has ceased making we do not think there are any dry collodion plates on the market. So little has been done in the direction of dry collodion of late years that all we can do is to refer you to back volumes of the JOURNAL—say fifteen years or so back. Formulae for collodio-bromide emulsions are given on pp. 1,089-1,092 of the ALMANAC. All of these are well suited for lantern transparencies.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

THE Fortieth Annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published next week. The total number of pages in the 1901 ALMANAC is 1552, and the volume is the largest yet produced. The text portion of the book occupies about 500 pages. It will, as hitherto, be issued in paper covers, price 1s., or cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Morgan and Kidd, of Richmond, Surrey, from a negative by Mr. W. Crooke, of Princes-street, Edinburgh. A number of other illustrations will also be found in the text matter. Over eighty articles on practical subjects, contributed by well-known photographers, form a feature of the volume. The principal advances of the year are synopsised in the "Epitome of Progress During 1900," and in the other sections, "Patented Inventions of the Year," "Miscellaneous

Information," and "Practical Notes and Suggestions of the Year," there will be found much useful matter, which, with the large collection of formulæ, tables, and other data for photographers, places at their disposal for daily reference a mass of information not to be found in any other photographic annual.

* * * The 1898, 1899, and 1900 editions of the ALMANAC (20,500 copies) were each sold out within a few months of publication.

EX CATHEDRĀ.

WE learn from photographers in various parts of the United Kingdom that high anticipations have already been formed of a successful meeting of the Photographic Convention of the United Kingdom at Oxford in July of next year. It is agreed that no more interesting, central, and beautiful a meeting place could have been chosen. Thus early the local Committee has taken in hand the work of organisation. Mr. G. W. Norton, the Hon. Secretary of the Oxford Camera Club, who will also act as Local Hon. Secretary of the Convention, informs us that a working committee of 30 has already been appointed and that a Reception Committee is also in process of formation. The President-elect of the Convention for 1901-2, Sir William J. Herschel, is also President-elect of the Oxford Camera Club. Next year it may be presumed that the distracting effects of the war and the Paris Exposition will no longer be making their influences felt, and that the Convention will be beneficially affected by a large attendance. It is, of course, full early to discuss preliminary arrangements, but perhaps Conventioners generally will be interested in knowing that at the first meeting of the Oxford Camera Club for the New Year an address will be delivered by the present President of the Convention, and that a part of the evening will be set aside for a short lantern lecture on the subject of past Conventions and some of their principal features.

* * *

At a recent meeting of one of the metropolitan societies a paper was read entitled "The Intensification of Carbon Prints." The paper will be found on page 725 of our issue

for the 16th ult. The title of the paper would naturally lead one to imagine that it was paper prints that were being dealt with, but we opine that it was transparencies or negatives on glass or other transparent media that were referred to, for it is difficult to conceive how any carbon print on paper could well be improved by "intensification," particularly by the methods described, as, after all, it is simply dyeing with coal-tar colours—which we all know are of doubtful stability. Also, of course, the paper would be dyed as well as the gelatine. However, as we have just said, we assume that carbon transparencies or negatives were really meant, and it is to them that what we shall here say applies. There are many methods of intensifying carbon transparencies and negatives that are well known, and have been for decades past to practical carbon workers, without having to resort to coal-tar colours, though, apparently, from the paper referred to, they do not seem to be known to some. That coal-tar colours are very undesirable ones to employ in connection with gelatine goes without saying, when the same end may be obtained with others of undoubted permanency. The carbon process is one of permanence, but if, say, a window transparency that has to be printed from or a negative be "intensified" with a fugitive dye, one can well realise what the result would be after a more or less brief period, and, of course, it would be a retrograde step to employ any such means. There are, however, a variety of methods of rendering the pictures denser, and modifying their colour, by the deposition of more pigment in the gelatine film, and that may be of any desired colour.

* * *

ONE of the oldest, best, and simplest methods of intensifying carbon transparencies or negatives is with a solution of permanganate of potash. That is one of the earliest, and the one employed by Lambert in the contretype process in the early seventies. With it all that has to be done is simply to pour over the surface of the picture a solution of the permanganate until the desired density is obtained. The strength of the solution is very immaterial—the stronger it is the more rapid is its action, and the weaker it is the longer does it take to do its work. This is a real intensifying process, inasmuch as an oxide of manganese is deposited in the film, and this is a permanent pigment. Carbon transparencies can be intensified with silver in exactly the same way as collodion negatives are intensified. The dry transparency is immersed for a few minutes in, say, a one per cent. solution of nitrate of silver. It is then slightly rinsed under the tap, and the usual acid pyro intensifying solution poured on with, if necessary, a few drops of solution of nitrate of silver added, until the desired density is obtained. This method yields a fine brown tone very suitable for lantern slides.

* * *

TONES of velvety black (more or less purple) can be obtained by simply immersing the transparency in a dilute solution of, say, the perchloride of iron, and, after slight rinsing, treating it with a solution of gallic or pyrogallic acid. In this way gallate of iron is formed in the film. By substituting other salts of iron for the perchloride, and in the place of using the gallic acid employing an infusion of nutgalls, tannin, logwood, &c., a great variety of purple black tones may be obtained, which are permanent. If

we desire a bright blue, it can be obtained in this way. The picture is first put into a solution of a proto-salt of iron—say the proto-sulphate—and after rinsing the surface is then immersed in a solution of ferro cyanide of potassium—the yellow of Prussiate of potash—when Prussian blue is precipitated in the gelatine film, another permanent pigment. Should we desire a yellow, we obtain it by first treating the picture with a solution of acetate of lead, followed by one of bichromate of potash. In this way we get the yellow chromate of lead—a permanent pigment—deposited in the film, which becomes very non-actinic. A bright red is obtainable by first treating the transparency with iodide of potassium, followed by bichloride of mercury. In this way we get the red iodide of mercury—a pigment with somewhat doubtful stability.

* * *

THE methods here described are analogous to those employed by dyers in dyeing fabrics, and an actual solid pigment is formed in the gelatine film in addition to what it already contains. The intensification of carbon pictures, it may be explained, is entirely different from that of the intensification of gelatine negatives. In the latter it is the material forming the image—*i.e.*, the silver—that is acted upon, the vehicle holding it—the gelatine—being inert. With the carbon picture the case is just the reverse; here the pigment remains inert, and it is the gelatine only that is affected. For this reason, when carbon transparencies have to be modified by after treatment, a tissue should be chosen, which is thin of pigment, so that the light penetrates deeply into the film and thus secures a maximum thickness of gelatine, while there is a minimum of pigment; for it must be borne in mind that whatever colour we obtain in the after treatment must, necessarily, be plus the colour in the tissue.

SIC TRANSIT.

WHY is it that photographs which perhaps we admire very much when they first come before us with the charm of novelty, seem to lose their attraction, or even to become absolutely distasteful after a certain lapse of time? That portrait of ourself, for instance, how we extolled its merits at sight, and thought it almost beyond the possibility of improvement; and now we take it out of its frame, and relegate it to obscurity, without a kind word or regret.

Is it that familiarity has bred contempt—a survival of the principle that, like a child with his new toy, old favourites get discarded in favour of the latest comers? Shall we say that in infancy and childhood things please but a short time, and as we grow older they charm us longer, but still never lastingly? If so, why are we not tired of our old paintings, our antique furniture, and those dainty odds and ends of bric-a-brac which delight the eyes of the modern housewife? Is it that these latter have an abiding beauty that time cannot destroy; that in their way they are perfect, while the photograph has an inherent imperfection that becomes more and more visible with further acquaintance?

First of all, however, we must not forget to take into consideration the fact that photographs tend to deteriorate with age. This is, of course, most marked in silver prints, but, in spite of their theoretical permanency, even platinotypes and carbons do not escape. To be sure, in the latter it

is the paper or support which goes wrong, rather than the image, but the evil effect is there all the same. If it were simply that we miss in our older photographs that sparkle and brilliancy of tone and colour which at first so pleased us, the difficulty would soon become cleared up. But no, after all this is a very superficial view of the question. It is beyond doubt that photographs often cease to please long before the unkind hand of Time begins to touch their pristine beauty. Perhaps, then, it is the originally imperfect picture, whose imperfection was hidden from our tolerating sight when its first beauties were seen, but which further acquaintance reveals to our now more critical judgment.

Suppose, for example, a picture in every way excellent, but with just one trivial fault in composition only be noted by the eye of an expert after careful scrutiny. Nine people out of ten, probably, will miss the flaw, and give a whole-hearted praise to the work. But after a while the excellences of the picture are taken for granted, and the eye grows more and more discontented with the lurking fault, all unconsciously perhaps, and without ability to give a name to the cause of its dissatisfaction. Let us call to mind a certain famous exhibition portrait, medalled at the "Royal," and once quoted everywhere as a perfectly satisfying and superb specimen of art and technique. Only recently some of us may remember to have read of the same picture, now again shown amid other surroundings, as hardly producing that feeling of pleasure and admiration which it at first excited. Better knowledge of the picture has not, however, revealed any fault; it still remains as an unchallenged type of photographic skill. What, then, is that mysterious "something" which has stepped in to prevent its continued triumph? It has not been placed alongside better pictures, nor even with those equally good, and yet general opinion agrees that it has lost in attraction—where once it was "facile princeps."

For the purpose of arriving more easily at some conclusion, we will limit our ground to the consideration of portraits. There is no really valid reason why what is said should not apply equally well to all photographs, but it will undoubtedly be easier to understand our likes and dislikes if we confine ourselves to a narrower road. We want to get at those first principles of Art which come into vital contact with photographic practice. Sometimes an anecdote lightly told may throw invaluable illumination on a doubtful point. A tale that has its lesson for us appeared lately in a well-known daily newspaper. The Pope, it seems, was giving a sitting to a famous English portrait painter. "How old you are making me!" said the venerable ecclesiastic, as his lineaments grew more visible on the canvas. "But are you not old, your Holiness?" deprecatively suggested the artist. "Ah, that may be," said the Pope. "But the idea I represent—the Papacy—is always young!"

Here we have an exponent of religion and morals unconsciously giving sound artistic teaching. The best picture is not that which most closely imitates nature. As Sir Joshua Reynolds observes:—"So far, therefore, is servile imitation from being necessary, that whatever is familiar, or in any way reminds us of what we see and hear every day, perhaps does not belong to the higher provinces of art, either in poetry or painting. . . . If our judgments are to be directed by narrow, vulgar, untaught, or rather

ill-taught reason, we must prefer a portrait by Denner, or any other high finisher, to those of Titian or Van Dyck, and a landscape of Van der Heyden to those of Titian or Rubens; for they are certainly more exact representations of nature."

But what has all this to do with photography? Why simply this, we are getting appreciably nearer to an understanding of how and why a photograph loses its charm for us. One more anecdote, this time about Sir John Millais, may serve to rivet the point. The great artist was painting a landscape out in the open fields, a curious rustic meanwhile gazing over his shoulder, with that calm, unabashed curiosity which only a rustic can show. "Did ye never try fotography, sir?" said the latter at last. "No," said Sir John, tolerantly. "It's much quicker," resumed the yokel. "Yes, it is," rejoined the artist. "And it's more like," concluded his critic, with a semi-pitying inflection, after a few minutes' profound silence.

That was the judgment of a rustic, altogether. It is precisely because the photograph is "more like" that it is, in esse, farther from the artistic ideal. It is too like, and it is this over faithful rendering of everything that is one of the greatest obstacles in the way of those photographers who aim to produce "things of beauty" that shall be a "joy for ever."

There are photographs, to be sure, that one never tires of, though they belong to a very small and select minority. An examination of such works will show, almost at a glance, what pains the producer had been at to avoid everything that jarred on an harmonious effect, and how he must have waited patiently till the exact moment came for obtaining a pleasing result. Then, also, it is generally evident how he has taken care to avoid too closely copying his subjects.

The camera is liberal to excess in what it gives us: the mechanical fidelity and exactness with which it reproduces everything before it is its most serious drawback, when that beauty which palls not is desired. The minute rendering of the texture and material of a coat or dress, with its every peculiarity of style and cut; the seizing of one momentary, fleeting expression of the face, rather than its normal characteristic look; in a word, the emphasising of all that we would most fondly suppress, are terrible obstructions to the photographer who wishes to produce broad and sympathetic work. Then, again, photographers are, on the whole, very apt to adopt mannerisms, and to follow too obediently what is considered "the right thing" in their own little coteries. And so we find the pictures that once were raved about and captured full many a medal looked down upon as early and crude examples, very good in their day, perhaps, but now quite improved out of existence.

In order that a photograph may have a lasting title to be considered a work of art, its producer must, necessarily, be well aware of what is artistic and what is not. In addition, he must be thoroughly master of his business, so that his work may obey his control, and show forth his individuality. With these preliminary qualifications, he will need strong self-restraint to prevent him making that full use of the possibilities of modern lenses, which is so fatal to breadth and harmony, also originality and daring to overstep conventional methods, and to defy the dictates of fashion and custom.

As an instance of what a photograph should be, many of

us may remember an excellent portrait of Her Majesty the Queen, produced by a photographer whose name is a household word, at the time of her Diamond Jubilee. We look at it still with unabated pleasure and interest, and feel quite sure that future generations will do the same. The technique is perfect, the pose and expression so natural and characteristic that the picture seems to tell the story of a life, the history of an idea, rather than the changing aspect of an hour. Let us compare it with so many other portraits of celebrities, that have been or are being produced, and very little consideration is needed to show how artificial and stilted so many of them are, in obedience to false ideas. The photographer needs to study more, to compare the productions of his camera with those of the other arts; not attempting that which is beyond his province, but striving to turn out the very best that his craft is capable of, in full assurance that that way lies an abiding success—a success, moreover, of which he need never be ashamed, since it will represent to him the triumph of conscientious and able work, attained by patient and honest adherence to that which he knows is true and beautiful, yet not too beautiful to be true.

Nickel Light.—For some time past it has been understood that sulphate of nickel, crystallised with seven molecules of water, was included in the list of substances acted upon by light; but quite recently a paper by E. Dobroserdoff, has been published in the *Journal of the Russian Physical and Chemical Society*, in which he proves the belief to be erroneous. He says if the crystals occupy a small portion only of the containing vessel they lose water, falling into another state of hydration, whether light is allowed to fall upon them or not. And, again, they are not changed by the action even of strong sunlight, if the air surrounding the crystals is saturated with water, nor if kept in filter paper saturated with turpentine, nor yet if the containing vessel is filled with the crystals.

Time and Labour involved in Preparing the Star Atlas.—To the outside observer who knows that the heavens are mapped out into small regions, each of which is taken charge of by a particular observatory, for the ultimate production of the great Photographic Star Atlas, it would seem a simple affair enough to tabulate and count them. But the recently published report of the Melbourne Observatory contains some interesting data, which are well worth extra charge, to show the immensity of the task involved. They have published catalogue plates of regions above 80° of declination, and many of them have been exposed in triplicate, so as to prevent any error, by giving three images of each star. A special micrometer for measuring the stellar images has been constructed, and is now successfully at work. It is estimated that the total number of stars on these plates is about one million and a half. Two observers, relieving each other every hour, measure from 400 to 500 stars per day. The authorities hope that six observers working six hours daily each, and making use of three efficient measuring machines, will be able to get through the whole of the work in about six or seven years!

Lantern Exhibition by Colonel Gale.—At the Royal Photographic Society's Lantern Meeting on Tuesday evening last, Colonel J. Gale exhibited about a hundred lantern slides from his own negatives, which he described generally as "Pastoral and Sundry." This title, if somewhat indefinite, was quite appropriate, for the collection included a very wide range of subjects—haymaking and carting, ploughing, sheep and cattle, sunrises and sunsets, storms, figure studies, and indeed, examples of almost everything, with the exception of the purely architectural. Almost every slide was a

perfect picture, and effectually controverted the assertion which has sometimes been made that an artistic lantern slide is an impossibility. Many of the photographs were taken at the outings of the Amateur Photographic Field Club, an organisation which was founded in 1858, and is probably the oldest photographic society in the world. Its meetings, according to the official statement, are held 'By Mead and Stream,' and Colonel Gale's pictures afforded ample evidence of their pleasurable character. Several of the slides were representations of scenes which now no longer exist; for, as he remarked of one of them, "I took it last year—this year the County Council have taken it."

A Reproach Removed from X Rays.—In the early days of X-ray work a strange affection of the skin was produced in the hands of some of those who had been demonstrating their properties to the public. As their use became more fully understood, it was found that acute dermatitis or inflammation of the skin, and a destruction of the hair, were set up by directing the rays for a sufficient length of time upon a particular portion of its area. It is evident, however, that there is something more yet to learn as to the exact action of the rays, for, at a recent meeting of the Vienna Society of Physicians, Dr. Krenböck introduced a man on whom the rays had had an exactly opposite effect, in fact his baldness was cured by them, although he had lost his hair some years ago. A round patch on the scalp was exposed six times for fifteen minutes to the rays, and the treatment extended over two months. The parts of his scalp untreated remain as bald as ever, but on the treated portions the hair has come again, thick and dark-coloured as of old. The subject is one that has so long been the practice to treat from a peculiar standpoint but at the same time it is obvious that we have very much more to learn about the action and properties of Röntgen's wonderful discovery.

MR. H. DAY'S CRYPTOGRAMS.

THE great American Republic has produced some of the keenest intellects of the century, and some of the biggest quacks, and of these last "Christian Scientists," "horse dopers," and "freak photographers," are the lowest and crudest types.

We sons of the old country welcome to our shores both kinds; but we respect the one, and use the other for amusement, as our kings in the old days kept paid fools or court jesters.

But what is one to say when our old Society welcomes and prints such puerile nonsense as Mr. Day's opening address? We are constrained to beg the rulers of our Parent Society in future to abolish these opening addresses, which can but bring ridicule upon us, and to leave such babblings for the columns of the Amateur Journalist.

But to traverse this tissue of ill-conceived, ill-written, and illogical babble.

We are told there are two schools in the wonderful country of the wooden nutmeg—the old and the new, and that all are leaders; and so the worthy tradition of Charter oak is maintained, and Washington (who never told a lie) is not stultified. Think of it. Two schools, the old and the new, and all "leaders." Now, did we not read various American magazines, we might be inclined to swallow this statement; but this so-called new school has been repudiated in the land of its birth, and we in this country have seen many photographs of the so-called, arbitrarily named, "old" school more worthy of regard than the "spoiled prints" of the braggart new school. And it is all the funnier because, in sober truth, *there is no American School of Photography at all*. The motifs, methods of presentation, and even argument for recognition, are just thefts from Great Britain. Nothing new has the American photographer devised, he is a follower, an imitator, but no originator; the best brains of the land of the dollar being engaged in pursuit of the elusive oof-bird. We in Great Britain are glad to see and welcome what the scholars of our school are doing; but let Mr. Day learn at once that the educated British public will not stand for a moment his unblushing effrontery, egotism and braggadocio, though it will welcome some of his best photographs.

And here I am bound with true British brutality to tell Mr. Day that he must learn to speak and write the English—our—language. To

write correctly and lucidly is an art far more difficult of acquirement than the production of "artistic" photographs. I cull some choice specimens of this Photo-Americanese.

"That we have in the States two distinct Schools of Photography is far more apparent than in the work I have had the pleasure of knowing as produced here."

"A smile. . . . that suspects its own justice" beats wooden nutmegs and "freak photographs"—"a special (sic) theoretical differentiation," is a wonderful thing—and so is a "colour portrait." Explain this, men and angels—or this: "How many, I wonder, in discarding a piece of camera work, stop to consider from what it is they remove?" and—prodigy of down East Yankeedom—what is "a visual colour?"

Poor, poor Mr. Day, who suffers from the itch of scribbling, you really must not bring such trash to this country, for we have a large educated public here. This is not America, the appreciator of E. P. Roe, the novelist?

To follow Mr. Day with his illogical, paste-and-scissors defence of photography as a fine art were to court madness, for there is no logic in the whole thing: much ignorance—i.e., the condemnation of our theatrical posters, many of which are art-works, the comparison of instrumental machine drawing with Da Vinci's hand drawing, to quote the poor babbler and moralist, J. Ruskin, in one of his most obtuse passages, e.g., "that manhood which has light in itself—though *the eyeball be sightless*," that mad creation which though blind, sans eyes, sans mouth, sans breath, sans anything, can yet shriek hysterically, "Behold, it is I." Poor Ruskin! poor Day!

Mr. Day wants educating badly, very badly. Many, many artists in this country and abroad have approved of the work of our British photographers when Mr. Day was wisely obscure; many trained artists (trained too in France) have practised photography long before the artists whose names he quotes as though they were some newly developed race of men carrying their heads beneath their arms, and their cameras on their necks. Yes, poor, poor Mr. Day! you should truly have informed yourself, it has all been tried and rejected in England, years and years ago, for we have found the drawing of the lens is not as the drawing of the artist; and photographs, it has been proved by artists and by some of our best writers, are false as Judas to the form of things as we see them, and even Mr. Demachy has at last learnt this lesson.

The speciousness of Mr. Day's time-worn propositions about the individuality of the print requires no answer—the wise on this side never dream of advancing such an exploded thesis. Poor Mr. Day!

And lastly, we resent as vulgar and false the braggart statement that these photographers across the seas "are one or two steps in the fore-front."

Mr. Day, we understand, is new to this country, and we cordially welcome him as a photographer—a professional photographer we believe he is; but we must warn him that our educated classes are not so gullible and raw as his American public, and, in fact, that he has got into bad company here—the company of the ex-counter-jumpers and gutter journalists, who are ignored by our cultured people, and we would ask him to heed Carlyle's famous words, "Silence is golden," and to take Mr. J. C. S. Mummery's most sensible advice "to make good his claims by his work."

ARGUS.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

[The Third Traill Taylor Memorial Lecture.]

III.

ATTENTION is here called to the fact that in this device the reflecting surfaces were inclined to the optical axis in the perpendicular plane; and there is no publication of the idea of inclining them in the horizontal plane previous to 1894. Chas. Cros, in a communication to the Photographic Society of France, in 1879 ("The Review of Games, Arts, and Sports," February 15, p. 221), in describing a transparent mirror device, expressly states that the mirrors are inclined at 45° to the sides of the box. Neither this nor any other persistence of vision device for this purpose has ever come into practical use.

The next conception of a photo-chromoscopic device was my own, for which I applied for a patent in February 1892.* In this device, the two transparent and one silvered reflector are supplemented by additional silvered reflectors disposed in parallel planes, in such manner as to dispose all the images on one plane, and the doubling of outlines was avoided by employing slightly wedged clear glass reflectors. This instrument could not well be made stereoscopic, and although perfect in its performance as a monocular photo-chromoscope, it was too costly and delicate in its adjustment for commercial manufacture.

In March 1894,† C. Nacher, of Paris, patented a device in which two of the images were blended to the right eye by the aid of a thinly silvered or platinised mirror, and the third image, made from a different view point, was seen directly with the other eye. This was an attempt to make a combined photo-chromoscope and stereoscope but, owing partly to the fact that very few people (if any) can successfully "blend" two primaries through two eyes, it was soon abandoned. This idea, first published by M. Nacher, is fully set forth in the *mémoire* attributed to Louis Ducos Du Hauron as of the date July 14, 1862, but first published in 1897: nevertheless, it is credited to Nacher on page 360 of the same book in which it first appears as belonging to Louis Ducos Du Hauron in 1862.

In September 1894, Carl Zink, of Gotha, published a description of a photo-chromoscope having three rectangular "steps," and two transparent and one ordinary silvered mirror, and a "cosmorama" lens. The new features in this device were the horizontal disposition of the steps, inclination of the mirrors in the horizontal plane, and all disposed to reflect from their upper surfaces, and an adjustment of angle to secure the best direct illumination of the reflected images. A horizontal disposition of the three mirrors had never before been published, although it appears in the Du Hauron 1862 *mémoire* already referred to, with one of them disposed to take the reflection from the under side. Zink's publication was anticipated by my application for a patent upon the same and several other important improvements in the "step" photo-chromoscope with transparent mirrors. My patent application, dating July 3, 1894,‡ discloses on only the arrangement shown by Zink; but (1) an efficient contraction to two steps instead of three, whereby the apparent area of the picture is nearly doubled, (2) the use of coloured glass reflectors by which doubling of outlines is avoided without the use of convex lenses or "thin silvering,"§ and the construction and adjustment proportionately simplified, (3) a stereoscopic construction, whereby the illusion of reality is brought to perfection, (4) a modification by which the images are disposed in line upon a single plate.

None of these ideas had been published before my dates of record.

Some months after the publication of my patent, Nacher claimed the same construction on the strength of a clause in his patent which was to the effect that two transparent mirrors instead of one could be used in his three-image stereo-chromoscope. The natural inference from the wording of this clause was that he meant one in front of each eye, the construction since adopted in the "Kromaz," and not an arrangement involving a totally different idea like my own. Even if it is assumed that he may have meant that two transparent mirrors could be used in front of one or both eyes, the fact that he so disposed his transparent mirror as to reflect from below proves conclusively that he had then no thought of direct lighting of the reflected images and the use of a folding chromogram, which I patented and which he reproduced, along with other details shown in my patent drawings, such as a tray base and strut for fixing the inclination, months after the publication of the patent.

Inclination of the mirrors in a horizontal plane, with the reflections

* U.S. Patent No. 475,084, published May 12, 1892.

† French Patent No. 237,394, March 29, 1894.

‡ U.S. Patent No. 531,040, published December 18, 1894.

§ The possibility of employing coloured glass reflectors was first disclosed in my U.S. Patent No. 475,084, published May 17, 1892; but the particular relation of the colours of the glasses to the respective images was first published in the *Journal of the Society of Arts*, May 19, 1893, p. 666, and patented in the U.S. in 1894. In his treatise published in 1897, Alcide Ducos Du Hauron publishes this for the first time as a proposition of his own: and it is only one of many ideas which have been claimed by Du Hauron only after they had been published or patented by others. Even Clerk-Maxwell and Harry Collen are totally ignored in this book.

taken from the upper surfaces, and the three images disposed in line upon one plate, patented and first published by me, also appears in Du Hauron's Melano-chromoscope.

As before stated, inclination of the mirrors in a horizontal plane, *but at opposite angles*, is disclosed in the Du Hauron 1862 mémoire. It is remarkable that the three-image stereoscopic construction patented by Nachet in 1894, a stereoscopic construction with three pairs of images, a two-step construction, methods of stereoscopic projection, and other ideas first made public by others, appear in this mémoire, and are first published as Louis Ducos Du Hauron's inventions twenty-eight years after he was challenged by Charles Cros to show a record antedating Cros' sealed mémoire of 1867. Du Hauron's reply to this challenge appeared in *Cosmos*, July 24, 1869, when he said, "I myself could have, at the conception of my idea [which he then dates back '*five or six*' years] consigned its generalities to a sealed letter . . . I gave up to the higher ambition to give to society and to France a system of heliochromy sufficiently elaborated," &c. This is his reply in 1869, *seven* years after it is now stated that he had prepared expressly for presentation to the Institute of France a mémoire of nearly 3000 words, describing a remarkably elaborate system, and that this mémoire was duly acknowledged and commented upon by M. Lélut, and read by at least one other member of the Institute, preserved all this time, and even now referred to as a "publication" in 1862. Although it may be inferred that his failure to get his mémoire presented to the Institute decided him to try to reduce the method to successful practice before trying again, it would seem most natural that he should have produced such conclusive proof of priority in reply to Cros if he was able to do so.

It is quite probable that the inconsistencies which I have noted may be satisfactorily explained away, but it seems proper, under all the circumstances, to raise the question, and I hasten to say that, for reasons well known to many, this can be done without questioning the integrity of Louis Ducos Du Hauron. I don't think the question would have been raised in my own mind if I had not already regularly found my own published ideas reappearing in France as French inventions, dated back without evidence, and my own publications totally ignored.

My 1894 "two-step" photo-chromoscope (to which I have given the distinctive name Kromskop) has never been rivalled by any other form of viewing device, and has been finally perfected by two "improvement" inventions.

As originally constructed, it was found that the inclination of the transparent reflectors between the eye and the green image introduced such a distortion of that image that the red and blue images, reflected from plane surfaces, could not be perfectly superposed upon it. The reason for this can be readily shown by tracing the path of the rays from the top and bottom of the green picture to the eye, both direct and as changed by refraction through the inclined transparent mirrors, the amount of distortion depending upon the thickness of the glasses; but I need not take up time with such a demonstration here. Suffice it to say, that I soon found two ways of correcting this defect, both of which were rather unsatisfactory from the manufacturer's point of view. One was to employ slightly wedged reflectors, so disposed as to correct the distortion, and the other was to introduce a similar distortion in the reflected images by attaching springs to the reflectors, so as to make the reflecting surface slightly cylindrical.* The first method, although efficient, called for weakly prismatic glasses, which cannot be obtained of sufficiently uniform accuracy by commercially practicable methods of grinding and polishing. The second method, although quite practicable in a commercial manufacture, is less perfect, and somewhat clumsy and troublesome. The final solution of the problem, a most obvious one when you come to think about it, was the introduction of a plane glass under the red image, equal in thickness to the sum of the two transparent mirrors, and inclined at the same angle.† This leaves the blue image uncorrected, but the error is only one-half what it would be in the red, and is of far less critical importance in the result, so that the image is now satisfactory to the eye. A kromskop made up without this compensation would now be instantly condemned.

* U.S. Patent No. 622,480, published April 4, 1899.

† U.S. Patent No. 635,253, published October 17, 1899.

Another defect which troubled me for a long time grew out of the fact that the coloured glass reflectors have polarising properties, while the silvered mirror which illuminated the green image did not have this property. With a grey sky as a source of illumination this did not much matter, but with a polarised blue sky the amount of light reflected by the transparent mirrors of the red and blue images varied with the angle of polarisation, so that an instrument which gave a bluish-white field when pointed to a portion of the sky near to the position of the sun, would give a yellowish-green field when pointed in a different direction, towards a part of the sky which appeared still bluer to the eye. The amount of light reflected from the silvered mirror was the same for all positions, but the amount reflected by the transparent mirrors sometimes varied enormously. There are half-a-dozen ways in which this defect can be lessened, but it is now eliminated by substituting a bundle of glasses for the silvered reflector in front of the green image.

The fields of the kromskop also became green by reason of the light gradually darkening the red screen, and this defect has been remedied by employing a different colouring material.

With these and other detail improvements, the performance of the kromskop is perfect, and, although the public is slow to appreciate its value and importance, it is coming into use in the United States in the fields of entertainment, art, medicine, and commerce, and will probably be regarded as a necessity for many purposes in course of time, as it is the only means of producing perfect visual reproductions of thousands of objects.

Another form of the instrument, which I call the "miniature" kromskop,* is a modification of one of the plans of construction which I showed in the original patent, permitting of disposing the three images in a line upon a single plate. To simplify the construction, images of the kromogram are looked at obliquely, and the consequent distortion corrected by introducing a prismatic lens and a 7° prism. This construction is practically very much cheaper than anything else that has been proposed, and the images, although small, appear larger than in the far more costly melano-chromoscope, which Du Hauron has produced by grafting some of the same ideas upon his original conception. Probably, I should say, which Alcide Ducos Du Hauron has produced by grafting some of my ideas upon his brother Louis Ducos Du Hauron's original conception.

With the exception of the "miniature" kromskop, all the forms of photo-chromoscope can be adapted for making the photographic colour records; but not one of them is a desirable construction for a camera, and no one who knows all the requirements will waste his time trying to make them interchangeable. Even if the general plan was suitable for both purposes, it would be both better and cheaper to construct two instruments, one specially adapted for each purpose, than to provide all the substitutions and readjustments necessary to make a single one efficiently interchangeable. This conclusion has been forced upon me after making several interchangeable instruments myself, and examining those which have been made by others.

Moreover, the most efficient viewing instrument is the kromskop, with images in three planes, and no camera for making kromskop pictures will ever prove permanently satisfactory unless the three images are produced upon a single plate. I am so sure of this that I would feel justified in ignoring all three-plate cameras, but for the fact that the construction of some of them involves ideas which also enter into the one-plate cameras, and have had a part in their evolution.

The idea of employing as a camera an instrument essentially like the kromskop, with dark slides attached, is a favourite one with many; but, besides the objections to trying to make such an instrument efficiently and conveniently interchangeable, and the objection to trying to use three separate sensitive plates, it has some very serious optical defects as a camera. In the first place, the illumination of the images will be uneven, because the amount of light reflected from a transparent mirror varies with the angle of incidence, which differs for different parts of the cone from the objective, and the illumination of the images formed by rays reflected from the transparent mirrors is greatest just where it is weakest in the image formed by transmitted rays, or by reflection from

* *Journal of the Photographic Society of Philadelphia*, March 1900 p

succeeding silvered mirror. In the second place, the proportionate illumination of the three images necessary to make the exposure required equal for the three plates cannot be readily controlled except by the use of compensating screens at the objective, which are almost certain to upset the selective absorption, especially if in the form of a party-coloured adjustable diaphragm aperture.

In the third place, the polarising properties of the transparent mirrors will under some circumstances introduce serious errors in the colour record. This is an important matter, of which I shall speak again. Here are five counts against trying to make an efficient camera out of an efficient photo-chromoscope.

Louis Ducos Du Hauron divorced cameras and viewing instruments at an early date.* He originated the method of controlling the relative degree of illumination of the three images by employing three objectives and three separately adjustable diaphragms, a principle which I once thought belonged to me; but he does not appear to have recognised the necessity of correction for unevenness of illumination across the images, which I accomplished by inclination of the diaphragms in the optic axis. This may appear to be a small matter, but the absence of such correction really constitutes a fatal defect.

The next step was to dispose the three images upon one plate, and this I did in 1892,† in trefoil, and in 1895,‡ in a line. In 1899,§ I devised two new and simpler transparent mirror cameras disposing the images on a line. Hundreds of successful negatives have been made with the 1895 cameras; the 1899 cameras, although equally efficient and of much simpler construction, will probably never come into use because already superseded by a still simpler camera of a different type, which I have since devised, and which, at least as a view camera, can have no rival.

Now, with respect to the defect introduced into triple cameras by the polarising properties of transparent mirrors of glass, a defect which nobody else has yet noted. Suppose that we have a camera with two transparent and one silvered mirror inclined in parallel planes one behind another in the optic axis, and that we are photographing a landscape view in which there is a portion of polarised sky. Naturally, the red image will be formed by reflection from the silvered mirror, and the blue and green images by reflection from the transparent mirrors. If the sky polarisation is at such an angle as to oppose free reflection from the transparent mirrors, the sky will be under-exposed in the blue and green images relatively to the other parts of the view, but will be fully exposed in the red image; in the reproduction the colours will be quite incorrect. The same will be true if the red image is made by light directly transmitted to the plate through the transparent reflectors. Other complications arise if one of the transparent mirrors is inclined in a perpendicular plane, and the other in a horizontal plane. In either case, every coloured surface which has polarising properties may be expected to be falsely rendered.

There is a remedy for this defect, so far as it applies to polarised skies. By placing a quarter-wave mica film in front of the camera aperture the light may be circularly polarised before reaching the transparent reflectors, and it is then reflected like unpolarised light. The mica film should be in a revolving mount, in order to set it always with the axis at 45° to the plane of the incident polarised ray.

It is true that the setting of the quarter-wave film, which is correct for the sky, may be quite wrong for other polarising objects which appear in the view. Water and even foliage give polarised reflections, and kromskop landscape reproductions have often been criticised for defects due solely to the polarising properties of the transparent mirrors in the camera.

Transparent mirror cameras possess one special merit, which is that, when properly constructed, they give, with one exposure, absolutely identical view-points for the three images. This would be very important indeed when utilising large apertures or photographing very near objects; but no constructions, so far mentioned, of transparent-mirror single-plate cameras permit of the employment of

* British Patent No. 2973, July 22, 1876.

† U.S. Patent No. 475,084, published May 17, 1892.

‡ U.S. Patent No. 564,889, published September 24, 1895.

§ U.S. Patent 655,712, August 14, 1900, and another, not yet published.

a large aperture, and they all require a good deal of knowledge and skill to properly construct and adjust.

Recently I have devised a one-plate transparent-mirror camera which can be made to fulfil all theoretical requirements with apertures as high as f-8, but its construction involves the employment of two large and very costly blocks of optical glass, and the angle of view is small, so that I still prefer for general studio work successive or alternating exposure cameras, one type of which I patented some years ago in England.*

We now come to the newest view camera; but, as leading towards it, I must go back to a suggestion made by Mr. Dallmeyer in 1891,† and which had the merit of great simplicity together with the defect of separate view-points. I refer to the use of rectangular prisms for dividing the light into three image-forming portions at the diaphragm aperture of the lens. This was a three-plate camera, and the use of rectangular prisms necessitated three separated diaphragm apertures in order to secure equality of illumination across the plates, the amount of separation of the diaphragm apertures depending upon focus of lens and angle of view. I used a similar arrangement myself in 1888, and a one-plate camera with triple aperture in 1890, but, although I published the fact in 1888 that I had a camera which made the three negatives simultaneously from "very nearly the same point of view," I cannot find that I published the construction.

In 1899 ‡ I modified this construction by substituting equilateral prisms for rectangular prisms, and thus obtained what may be described as a single, narrow, party-coloured aperture, giving practically a single view-point, and yet transmitting enough light to make kromskop pictures of landscapes with five-second exposures. Finally, by employing rhomboidal prisms, I projected all the images backward upon a single plate, and, taking advantage of the property of the higher refractive index of glass as compared with air to extend the focal point, so calculated the form and size of the prisms as to make the images identical in size and perspective upon one plane.§ This camera, which, notwithstanding its small aperture, is as quick as any of the efficient transparent mirror cameras, except the new one last mentioned, is incomparably simpler and easier to construct and adjust than any other efficient one-plate triple camera ever devised, and is entirely free from the polarisation defect.

This form of camera can be made stereoscopic, and it can also be adapted to work with a comparatively large aperture and single view-point for studio work by mounting the rhomboidal prisms on a rectilinearly vibrating support, so that the light is transmitted to the different images alternately in rapid succession. The movement of the prisms does not disturb the position or definition of the images, so no shutter is required, and the exposure is always going on in such a way as to make one as independent of fluctuations in the light as with the smaller-apertured view camera. All other alternating exposure cameras which have been devised require a shutter to cover the lens aperture during the movements, involving considerable loss of time in making the exposures. There are so many obvious ways of carrying out the idea with this limitation that they are not worth mentioning.

I have now come to the end of the list of triple cameras which seem to me to contain original features of practical value. The sliding back for making successive exposures upon a single plate still has the advantage of being much cheaper than anything else, and is efficient in a steady light with still objects. I make this in stereoscopic form with inverting prisms in front of the objectives, so that the stereoscopic pairs are reversed and transposed ready for mounting for correct vision in the stereoscopic kromskop.

I believe the first special triple lantern for colour projection was used by me in my demonstration at the Franklin Institute in February 1888. On a single lantern body there were three complete optical systems, disposed side by side, with the objectives adjustable for register, and three lime lights. The three positives were mounted on a single wooden slide.|| This lantern was made to fold very com-

* British Patent No. 3232, 1897.

† THE BRITISH JOURNAL OF PHOTOGRAPHY, July 10, 1891.

‡ U.S. patent No. 632,573, published September 5, 1899.

§ Journal of the Photographic Society of Philadelphia, March 1900, p. 21.

|| U.S. Patent No. 432,530, published July 22, 1890.

pactly, according to a principle which I patented in 1885,* and was adapted for ordinary dissolving views as well as colour projections.

In 1891 Albert Scott devised a quadruple projection apparatus with one source of light, one condenser to parallelise the rays, and four smaller condensers and four objectives to project the four images, which were of very small size. It is obvious that a triple-image apparatus can be made upon the same principle.

At the annual meeting of the American Association for the Advancement of Science, at Springfield, in 1895, I employed a "lantern kromskop," which was substituted for the ordinary lantern front in order to make trichromatic projections. In this device a small condenser parallelised the rays from an electric arc, and the light was divided into three portions by an arrangement of bundles of clear glass and silvered mirrors, after which it passed in parallel beams to three separate condensers, colour screens, and positives, coming into three objectives, adjustable for register. In front of these objectives, 15° prisms were used to separate the images in trefoil, and bring them back into register again, for demonstration purposes.

An improvement upon this device is shown in my British patent, No. 5800, of 1897, in which swinging lens fronts, coupled to pivoted silvered reflectors, and operated by a lever, are substituted for the revolving prisms for separating the images upon the screen. I have also recently improved the construction and adjustments of this instrument.

It is obvious that, by adapting three condensers and three sources of light to any photo-chromoscopic apparatus, projections can be made, and this idea has been patented more than once; but it is far too wasteful of light to be worthy of consideration from a practical point of view. A single source of light is as efficient with the "lantern kromskop" as three sources of light can possibly be with any transparent mirror direct-viewing device, for reasons which should be obvious to anybody who knows enough of optics to trace the reflections in both instruments.

Having described the most successful and important methods of positive synthesis with three images, I now come to the idea of analysis and positive synthesis with a single image, which may be a sort of linear mosaic of the three separate images heretofore considered.

This idea belongs to Louis Ducos Du Hauron, and is a brilliant conception, although of doubtful, or at least very limited, practical importance. As a clever invention it ranks as high as anything that has been done in trichromatic photography.

The principle of this method was fully set forth in Du Hauron's 1868 patent, coupled, however, with his failure to recognise the correct triad of primaries, and the principle of colour-curve analysis, and pure-colour synthesis. He proposed to make a single negative image through a screen made up of fine juxtaposed coloured lines, alternately red, yellow, and blue, and then to view a positive from this negative through the same screen, making the real lines of the screen cover the lines which were made in the negative through red lines, and so on. It is evident that, with lines fine enough not to be separately perceived by the eye, the result should be a complete coloured picture requiring no special viewing device to see it in its perfection.

Years after I had demonstrated the principle of colour-curve analysis and pure-colour synthesis, Dr. Joly applied the principle to this process, until then unknown to me. McDonough, in America, also revived the process, with red, green, and blue-violet colours, but not with a full recognition of the true principles of colour selection.

This process is exceedingly difficult to carry out successfully with coloured lines fine enough not to be offensive to the eye, and, when the images are made stereoscopic and magnified in the stereoscope, the line structure is positively distressing. It is best adapted as to effect for large window transparencies, to be seen from such a distance that the coloured lines are not separately perceived; but it is said, that when so exposed the colours fade considerably in a little while.

It is very difficult, if not practically impossible, to make a correct selective line screen with from 300 to 600 lines to the inch—it is diffi-

cult enough to make such screens with superposed coloured films and glasses in separate squares—and it is doubtful if there are any suitable dyes for this purpose which are permanent. Such records can, however, be made by successive exposures through an opaque line screen, employing the same selective colour screens that are used in the kromskop cameras.*

In 1895, I thought of a method of making such negatives which permits of a single exposure for all three colour lines, with an opaque line screen, but I had no use for it until last year, when I also devised a means of synthesis for such pictures without the coloured line screen, and I then applied for patents for both inventions.† I afterwards learned that Jan Szczepanik had applied for a patent for the camera in France, No. 287,709 of 1899, and that J. A. C. Branfil published a somewhat similar idea in THE BRITISH JOURNAL OF PHOTOGRAPHY, February 26, 1897. It is really, however, an application to this process of my original principle (1886) of screen "pin-hole images" of the lens diaphragm in the half-tone process.

F. E. IVES.

FOREIGN NEWS AND NOTES.

Orthochromatic Photography.—Dr. E. Vogel, the Editor of the *Photographische Mittheilungen*, cautions his readers against the use of dipped plates, according to the formula recommended by Oscar Pöhwert for oil paintings, in which green, yellow, &c., predominate. This formula was published in the *Atelier des Photographen*, and consisted of 300 c. c. of water, 10 c. c. of uranin solution (1: 200), 3 c. c. of ammonia, 5 to 10 drops of nitrate of silver solution (1: 10). Ordinary plates to be dipped therein, washed with distilled water and exposed wet. Dr. E. Vogel remarks that not only do plates exposed in the wet state give less sharpness, but that uranin is the worst colour sensitiser of the eosine group, and cannot be compared with erythrosine for practical purposes. Another formula for dipped plates to be exposed after drying, which consists of a solution of acridine yellow, chinolin red, and eosine, is likewise condemned. The screen recommended, consisting of aurantia and brilliant green, is also unfavourably regarded by Dr. E. Vogel, who asks why a green screen should be selected, for oil paintings above all things. It reduces the action of the orange and red, the effect of which rays should be favoured. In conclusion Dr. E. Vogel remarks, that it would be better for the photographic world if it were not favoured with such doubtful recommendations, which only serve to discourage beginners from further experiments with colour-sensitive plates.

An Artificial Spectrum.—At the October meeting of the Vienna Photographic Society an artificial spectrum was exhibited, which had been sent by Dr. E. Greebe of the Carl Zeiss Optical Works at Jena. The spectrum was composed of four coloured glass prisms, which together formed a thick plate. These may be roughly described as an obtuse-angled yellow prism with a right-angled purple prism on the left, and a blue rhomboidal prism on the right. A right-angled purple prism on the right of the latter completes the plate. The colours selected for the prism correspond with the ideal colours for trichromatic purposes. By suitable combination any shade of colour may be produced. The artificial spectrum may be practically applied as a test in orthochromatic photography.

Preparing Zinc Plates.—The *Moniteur de la Photographie* quotes from *Le Procédé* the following process of preparing zinc plates for the albumen or bichromated mucilaginous processes. The plate should be carefully polished with polishing felt and tripoli, then rinsed in running water, and whilst still wet impressed in the following bath:—

Water	1000 c. c.
Alum	50 grammes.
Strong solution of gum arabic	50 c. c.
Nitric acid	20 c. c.
Sulphuric acid.....	5 c. c.

Rock the dish and keep the plate in the bath two or three minutes. Wash the plate in running water for ten or twelve minutes, and let it

* U.S. Patent (Macfarlane Anderson) No. 559,051, April 28, 1896, and U.S. Patent (F. G. Harrison) No. 578,147, March 2, 1897.

† U.S. Patent No. 648,784, published May 1, 1900, and another not yet published.

try spontaneously by exposure to air. The badger should not be used, as the slightest friction will spoil the extremely fine grain of the surface thus prepared.

Platinum Toning.—The *Deutsche Chem. Zeitung* gives the following formula for toning matt chloride papers:—

Water.....	1000 c. c.
Chrome alum.....	10 grammes.
Salt.....	40 "

For use take 50 c. c. of the above solution, and 1 gramme of sodium platinic-chloride in 950 c. c. of water. The bath should have a temperature of 20° C. The tones range from reddish-brown to black. As soon as the prints have reached the desired colour they should be transferred to a bath of water rendered alkaline by the addition of a little ammonia or soda. The fixing bath should also be alkaline.

Chloride of Gold.—The following method of testing chloride of gold is given by H. Reeb, in the *Bulletin de la Société Française*. One equivalent of chloride of gold is deprived of its colour by four equivalents of hyposulphite of soda; but, in order to determine the reaction more readily, a few drops of saturated solution of iodide of potassium are added to the solution of gold to give it a dark brown colour. Dissolve 1 gramme of the chloride of gold in water and dilute to 100 c. c. Prepare a fresh solution of hyposulphite of soda, 1: 1000.) Take 1 c. c. of the solution of chloride of gold and add 2 or 3 drops of the saturated solution of iodide of potassium. From a burette add drop by drop sufficient of the solution of hyposulphite of soda to the gold solution to discharge the colour. Read off the quantity of hypo solution used, multiply it by 4 and the product is the percentage of gold contained in the solution of gold chloride. Thus, if 12 c. c. of hypo solution are used, there is 18 per cent. of metallic gold in 100 parts of the gold chloride. Pure brown chloride of gold should contain 64·79 per cent of gold.

Affixing Paper to Metal.—The *Photographische Chronik* gives the following hint to those who may wish to attach labels or mount photographs upon metal. Thoroughly cleanse the surface of the metal from all traces of grease by washing it with hot water in which soda has been dissolved. Rub dry with a clean duster and prepare the surface with the juice of an onion. The photographs may then be mounted in the ordinary way upon the metal, and will adhere to it firmly.

The Trials of an Enthusiast.—Our Belgian contemporary, *Helios*, has a good story of a young solicitor's clerk, who formed the idea of making a collection of photographs of monstrosities. Thinking the Paris Exhibition would be a favourite field for snap-shottting extraordinary types of human beings, he took advantage of the permission given by the authorities for using the hand camera on Sundays. A portly dame, whose face was adorned with whiskers, and whose eyebrows formed a continuous line above her nasal appendage, allured his photographic instinct. No sooner had he pressed the button than the stately figure swung round and landed a vigorous blow with an umbrella upon his head. The intrepid young man defended himself as best he could, but the infuriated dame seized him by the throat, and would have strangled him had not the police rescued him from her grasp. Both were taken to the police station, and the indignant lady was there informed that the amateur had not exceeded the privileges enjoyed by every citizen within the precincts of the Exhibition, and that she must take proceedings against the photographer before a justice of the peace if she felt herself aggrieved.

OZOTYPE.

[A Paper read before the West London Photographic Society.]

THE advent of a new process, or a notable modification of an old one, seldom fails to attract the attention of photographers—especially those who, in the practice of their hobby, endeavour to infuse into the records and souvenirs of their wanderings as much pictorial quality as possible.

If it be conceded that a photograph, possessing the combined qualities of beauty and truth, is preferable to one having the latter characteristic only, it seems obvious that every effort to secure these united qualities is to be commended and encouraged. It also follows that

any new process which lends itself to this combination, either by affording a means of obtaining better results than are possible with any other process, or one giving equally good results with greater facility and certainty, must be accorded the photographer's hearty welcome.

Without wishing it to be inferred that the present well-known permanent processes are considered deficient in the principal desirable qualities, it is undeniable that the photographer, however skilled he may become, is more or less confined, within certain rigid limits, by the materials and apparatus at his disposal, for giving effect to any artistic or pictorial ideas he may possess.

That many photographers chafe under this restraint, and strive after greater freedom and means of expression, has surely been abundantly demonstrated at the principal exhibitions held during the present year.

It would be beyond the scope of the present paper to discuss the merits and failings of the many revivals, and improvements, of the various printing processes, or, to point out in detail the limitations to which brief reference has just been made; they will be only too vividly in the minds of all who have consistently tried to keep in touch with the latest products of the tireless experimenter.

In a general way one might repeat the well-known axiom, that it is desirable, for any and all printing processes, to obtain as perfect negatives as possible. Further, whilst it may be fairly true that a perfect negative will yield a good print in any process, it seems a very general opinion that a thoroughly good negative for carbon printing is not of necessity an equally good one for platinum, and vice versa.

Assuming, then, that the photographer has obtained the best negative that the subject itself permitted, or that was possible under the existing conditions or circumstances, the next desideratum would appear to be a printing process of great plasticity, and susceptible of very considerable modification and control, which, in the hands of a careful and fairly skilled worker, would enable him to give expression more freely to the ideas of beauty that the subject impressed him with, in spite of a certain amount of shortcoming on the part of the negative.

It will be for you to form your own opinion, whether anything you will see and hear to-night constitutes an advance, however slight, towards the realisation of your hopes, making due allowance for the very brief acquaintance of the lecturer with the process, and his consequent inability to do it full justice.

It seems probable, bearing in mind the almost invariable experience of the past, that prolonged trial, accompanied, as usual, with much vexation of spirit, will in due course prove whether ozotype in its present form, or with possible improvements, is to be one of the chosen processes for displaying the pictorial possibilities of photography.

Instead of making comparisons with other printing processes we proceed, perhaps the better plan, whilst avoiding the quarks of theory, will be to lay before you the working technicalities of ozotype, and at the same time draw your attention to some of the claims made on its behalf, leaving those who are well acquainted with other processes, to institute comparisons for themselves, and thus pave the way for an instructive discussion.

The ozotype print may be said to resemble one in carbon in the constituents composing it, that is to say, the final image consists of insoluble pigmented gelatine supported on paper of suitable or desired surface and texture. The method of producing it—at any rate in the earlier stages—is essentially different.

The requisite materials are:—

1. A supply of suitable sized paper, free from alkaline substances.
2. A bottle of sensitising fluid—to be obtained from the Ozotype Company, or dealers.
3. A small bottle of Lepage's fish glue, for sizing paper that may be bought in the unsized condition, but otherwise suitable.
4. A broad flat brush of soft bristle.

The other apparatus, required in the after treatment and production of the print will probably be in the possession of all photographers—at any rate, carbon workers.

Since very full and explicit instructions for working the process are given in Mr. Thos. Manly's book, the operations will be only briefly touched upon; a few results put before you, and, finally, one or two illustrations given of the methods of working.

In the first place, then, if a suitable sized paper is not readily obtainable, any other paper of good quality and surface—fairly smooth to be preferred for sizes up to whole-plate—may be sized in the following manner.

First prepare the sizing solution. A convenient and very satisfactory one consists of one ounce of Lepage's fish glue, dissolved in nine ounces of water: when cool it is ready for use. Having pinned a piece of paper, say 30 in. x 22 in., to a clean drawing board or table, pour a small quantity of solution on to the paper, and brush it rapidly backwards and forwards, and again crosswise, to produce as even a layer as possible, and to avoid using an unnecessary quantity of size. A very little practice enables one to judge where best to pour the size on the paper, and about how much will be required to

comfortably cover the surface when well brushed. The drawing board may be then stood on edge, and the paper left to dry, or the paper may be removed and hung up by the two top corners. If the paper is of open texture or an absorbent nature, a second coating of size may be given with advantage when the first is surface dry.

When the final sizing has become surface dry, but not hard, the sensitising solution should be applied. It is probably unwise to perform this operation in full daylight, but it may be done with perfect safety by the aid of a comfortable amount of artificial light. The sized paper is again pinned down as before, and a small quantity of the sensitising solution applied in a very similar manner to that adopted in sizing, but with this difference, that the amount of sensitising mixture may be accurately measured, and waste avoided. The amount required for the size 30 in. \times 22 in. before mentioned, will vary from three to three and a half fluid drachms, according to the texture of the paper used. A useful figure to remember will be one drachm to one and a half square feet of surface.

When this solution has been carefully brushed all over the surface so as to cover it evenly, the paper may be hung up to dry, the time for which will be from 15 to 60 minutes. It will be found that complete success with this process will depend largely on the care with which the paper has been sized and sensitised. If there are any serious inequalities, they are apt to show in the print and ruin it.

The drying of the sensitised paper must unquestionably be carried out in a non-actinic or a very subdued artificial light. When dry it may be at once cut up to desired sizes, being careful to leave an inch or so of margin at each end for handling. A slight margin at the sides will also be found an advantage.

In this state the paper is ready for printing, and will keep in good working order for a long time if cared for in the same manner as platinum paper, and for some weeks if put in a dry drawer under slight pressure. The operation of printing is conducted in the same manner as with platinum paper; the time required is perhaps somewhat less, and the appearance of the image almost identical. Any difference will be in the direction of a stronger print, having more of the fine details visible.

The next operation is to thoroughly wash the prints, and in order to economise time a number may be operated on at once. Place them, one at a time, in a large dish of cold water—in any convenient place and in any light—and keep them moving for ten minutes. Pour all the water away and refill with clean water for a second and third bath of 10 minutes each. The prints are then ready to be hung up to dry. With very thick or absorbent papers, an increase in the number of baths or in the time will certainly contribute to better results—indeed, there seems no objection to a fairly prolonged washing to ensure the removal of all chemicals unaffected by light.

The surface moisture may be blotted off without injury to the prints, which, when dry, may be kept indefinitely, or until a suitable occasion presents for pigmenting them. They are, of course, no longer liable to injury from light.

When about to pigment the prints, we proceed as follows:—A bath is made up of water 40 ounces, glacial acid 60 minimis, hydroquinone 15 grains, and pure sulphate of iron 5 grains. The ingredients are added to the water in the order given, and thoroughly dissolved before using the bath, which will remain in good order for two or three weeks.

It is stated that this bath should be used at a temperature of from 65° to 75°, but the reason is not given; presumably, it is to be sure of getting the gelatine—with a definite time of immersion in the bath—into a suitably soft condition for making close contact with the whole surface of the paper print, when the two are squeegeed together.

Having prepared the acetic bath with, say, an inch and a half depth of solution, and warmed it to the required temperature, take a piece of the pigment plaster and place it face downwards in the bath. After about half a minute's immersion, turn it over and brush the face gently with a flat camel's-hair brush to remove air bells, &c. In about another half minute the plaster will be soft and limp; then take a print and bring it into contact with the plaster under the surface of the solution, taking care to lower it into the bath in such a way as to avoid air bells if possible. Lift the two out of the bath together, lay them down on a flat surface, plaster uppermost, and firmly squeeze them together. After removing the remaining surface moisture with blotting-paper, hang the prints up to dry.

When the pigmented prints are dry, or have been hanging in a dry place for not less than three hours, they are ready for development. In this state, also, the prints will keep a considerable time without deteriorating.

The process of development will present no novelties to the carbon worker, and no difficulties to the beginner.

A large tray to contain hot water is almost the only thing necessary, with some means of keeping the water at a temperature of about 105°. While the hot bath is in course of preparation, place the prints in cold water, and let them soak for 20 or 30 minutes—depending on the time of year—colder weather requiring the longer period.

If a large number of prints are being dealt with, it may be necessary

to remove some of them after half an hour's soaking, and place them on blotting-paper to await development.

Take one of the soaked prints and plunge it under the surface of the warm water; allow it to remain from one to one and a half minutes, then take hold of one corner of the paper backing of the plaster, and gently, but firmly, strip it. Care must be taken not to stop during this operation, which should be performed quite under the water or quite out of it. The objection to a stoppage in the act of stripping is that the print is liable to show a mark at the point where the delay occurred. The print may now be developed, or, if a number are to be done, it may be placed, face upwards, on blotting-paper until all are stripped.

To develop the print, place it face downwards in the hot water and leave it for about a minute to soften; turn it over and draw it on to a piece of zinc or glass to form a flat support, and then lave or splash water over it with the hand, or pour from a cup or mug until development is deemed complete. Sufficient experience will soon be gained to enable the operator to decide whether the print requires more or less soaking, in addition to the laving or pouring operations.

When development is complete, the print may be placed at once in a cold alum bath, and then, with a final rinse in cold water, hung up to dry. If the alum bath is postponed until after drying, to permit of slight local development, the prints should always be put into cold water for a few minutes—just to chill the gelatine—before hanging up to dry, or there is great risk of the image running in beads and ruining the print.

When finally dry, after the alum bath, the prints may be mounted or handled in the usual way, the image being no longer soluble.

It would be presumption on the part of a beginner to speak of defects in the process, but there can be no objection to his pointing out where he has failed to get the desired results, or where the prints fall short of his ideal.

Practically, the only difficulties met with have been to acquire a correct judgment of the correct depth of printing with various negatives, and to get the plaster to adhere evenly on rough papers.

The prints shown to-night indicate clearly that the former difficulty is soon overcome; the latter, it is confidently hoped, will disappear with a little more practice.

One peculiarity may be mentioned, as it seems difficult of explanation, viz., the failure of the pigment plaster to adhere to the print outside the edge of the negative, and where the greatest exposure to light had taken place.

The points of superiority over other processes appear to lie with the means of producing the prints, rather than with the results.

The claims may be briefly stated as follows:—

1. The resulting print is permanent.
2. Paper with a variety of tones and surfaces, at the choice of the worker, may be used.
3. Various coloured pigments are available, giving definite and invariable results as regards tone or colour.
4. Modifications may be made in the sizing and sensitising of the paper, and in the composition of the bath used for pigmenting; all of which are said to give control over the final print.
5. By means of the above modifications, various grades of negatives may be used to produce satisfactory prints.
6. All the materials will keep—almost without exception—for an unlimited time without risk of injury.
7. The only operation that cannot be performed in ordinary daylight is drying the sensitised paper.
8. A delay of a week or two between any two consecutive operations will not injuriously affect the result. This quality is, of course, invaluable to the amateur.

9. It is to all intents and purposes a printing-out process, no actinometer or print meter being required.

Nearly all the prints attempted are shown to-night with notes upon them indicating the probable or supposed causes of failure.

With an illustration of some of the principal operations, the subject is at your disposal for free discussion and liberal criticism.

Mr. Manly has been kind enough to send some particulars of his latest practice, with permission to place them before you. He says, "I find it a good plan to dip the washed and dried prints in a glycerine solution (glycerine 1 part, water 2 parts) just before applying them to the plaster in the acetic bath. This prevents air bells from accumulating, and causes the gelatine to adhere properly to the paper. If you have no glycerine, sugar will do as well—loaf sugar 1 part, warm water 4 parts—draw the prints over the surface of the solution. The acetic bath I find best for good negatives is

Water	40 ounces.
Glacial acetic acid	60 minimis.
Hydroquinone	20 grains.
10 per cent. solution of sulphate of copper...	60 minimis.

The sulphate of copper (which can be left indefinitely as a 10 per cent. solution) I find more convenient than the ferrous sulphate. For cartridge paper (which should be good), or for Whatman's hot-pressed

coat the washed prints, with a camel's-hair brush, with the following sizing solution:—

Fish glue	2 drachms,
Glycerine	1 ounce,
Water	6 ounces,

and put them in the acetic bath without drying. The paper used not be sized previous to sensitising, and the plastered prints can be developed two hours after the acetic bath, whether wet or dry."

G. F. BLACKMORE.

THE NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION.

In our review last week of the Hackney Photographic Society's Exhibition we spoke in emphatic terms of the neglect by that Society of portraits and figure subjects, and we also remarked upon the improvement, not only in photographic skill, but in the general taste displayed in the selection of subject and the mounting and framing of the pictures by the junior members. The Hackney Exhibition happens to be the first of the winter series of exhibitions held by the metropolitan photographic societies, and, as we have often stated, we have found, and expect to find, there the dominant tone of the series. That our theory is correct is supported by the Exhibition at present under review. The Exhibition, as a whole, was better than that of last year, but the improvement was mainly due to the better quality of the work of the less-known members. Of course, we could hardly hope to find any great advance in that of the leaders of the Society. The small proportion that portraiture and figure studies, and, indeed, all other branches of photography, bore to the landscapes was quite remarkable. At a society exhibition in bygone times one generally found it the case that attempts were made by the same individuals to excel in many branches of photography. Over and over again we have had to deprecate such attempts, and to preach the doctrines of specialisation. We never contemplated, however, that the time would come when whole societies would specialise in the same direction. Landscapes, treated pictorially, are perhaps the most interesting of all subjects to the general visitor to an exhibition of present-day standard, but that is mainly because the average quality of the landscapes is superior to that of other subjects. No one can dictate to a body of photographers who individually practise photography for their own amusement what branch each individual shall take up, and in the earlier days in a society's career it is a sign of strength that those members who are in a state of pupilage should choose to follow the steps of those who are capable of leading them. In a well-established society it is not a sign of strength that all should elect to follow the same lines, for it suggests the idea that the many are simply mere copyists of the few. To tell the truth, that is the impression we often get in viewing the work at an exhibition.

The North Middlesex Exhibition was held, as usual, at the Jubilee Hall, Hornsey-road, N., on the 3rd, 4th, and 5th inst. It was entirely confined to the work of members, and the awards of the judges, Messrs. Chas. Moss and J. B. B. Wellington, were given on the same principle as those at the R.P.S. Exhibitions, for distinctive excellence of work.

The awards were made to H. Stuart for "On an Essex River," R. Child Bayley for a portrait, A. Herbert Lisett for "A Private Corner," and J. C. S. Mummary for "Pagglesham Port;" and the following append was made by the judges to their awards:—

"In addition to the above, the judges wish to mention 'The Beach Road, Tangiers,' by R. Child Bayley, and 'A Girl's Head in Profile,' by A. Herbert Lisett. The work of J. C. S. Mummary shows a high standard of excellence throughout. Much of the landscape work generally would have called for recognition had more care been exercised in the selection and printing in of the clouds; in many cases were altogether wrong and unsuitable. Speaking generally the works showed evidence of much care and no little pictorial knowledge."

While we agree with the criticism of the judges absolutely, we did not find the reference to the badly-chosen and unskillfully-printed clouds more deserved here than at most other exhibitions. It is a very common fault, and one that men with even great reputation are not innocent of. The judges' impressions on this point were probably influenced to a great extent by one picture, "A Bit of Hampstead," by S. E. Wall, which certainly would have been one of the most admired pictures in the Exhibition but for its unfortunate sky. It had every desirable quality except that what were intended to represent detached masses of clouds were apparently masses of something pendant from the branches of the trees.

With redundant modesty Mr. F. W. Cox has labelled his pictures "not for competition." They were in bichromated gum, and were as good examples of translating a negative by that process as any we have seen. We unhesitatingly express our admiration of many of them as pictures, but we are in doubt whether we ought to compliment Mr. Cox as a skilful photographer or as a skilful handler of a brush. Mr. Cox as a skilful photographer or as a skilful handler of a brush. Mr. R. Child Bayley's "A Portrait" seemed to us to have a most

infelicitous title. We can hardly imagine that any self-respecting young lady could assent to the woe-begone, bedraggled-looking creature that Mr. Bayley portrays as a portrait of herself. We should have felt inclined to ascribe this production to the influence of the American school of photography, but we happen to know that the negative was made some years ago, before there was an American school. We doubt, however, if we shall be far wrong if we ascribe the certificate awarded to it to the influence of the American school on the judges.

J. C. S. Mummary's landscapes would be, most of them, familiar to visitors to the recent great Exhibition. Needless to say, they possessed the characteristics of style and refinement in treatment usual in the work of their author. A portrait study by the same, though not equal to the landscape work, was promising. H. Stuart's chief work was his certificated picture which was hung in the recent R.P.S. exhibition, entitled "On an Essex River." A figure study, entitled "In an Old Garden," was commendable rather for its photographic than for its pictorial qualities. A. Herbert Lisett's work was careful, and, we think, an improvement on that he has shown before. R. R. Rawkings seemed to have allowed his ambition to run to quantity. His work was, on the whole, good; but there was nothing that specially riveted the attention. S. E. Wall, one of whose pictures we have already referred to, seemed to have been afraid to use a full range of gradation in most of his pictures. In "Derelict" he had a pictorial subject, and his method of treatment was obviously good; but it was not quite satisfactory. "Bosham Creek" was another good subject, but as a picture it was marred by a weakness at one of the margins which led the eye out of the picture.

W. Taylor's most interesting pictures were views in "Cloth Fair, Smithfield," and "Staple Inn, Holborn." They bore testimony to the possibility of obtaining views in London equally valuable as pictures and as records. H. W. Bennett was represented by some of his fine architectural work. J. W. Marchant's work was not so striking as some we have seen, but his views were well selected and the photography was good. Among the other exhibitors whose work pleased us were H. Smith, T. Pring, E. R. Mattocks, A. G. Lawson, F. A. Haylett, F. A. Bishop, and J. J. Armitage.

The lantern slides were fairly numerous and the average quality was good, as far as we could judge them in the exhibition frames.

DR. RUDOLPH'S IMPROVEMENTS IN LENSES.

[Patent No. 24,089 of 1899.]

The photographic objective hereafter described has been devised for purposes which require a large aperture and an anastigmatically flattened field for a comparatively large angle. The advantage of this objective, as compared with combinations hitherto known for similar purposes; for instance, the objectives described in specification No. 6028, A.D. 1890, and, like anastigmatic constructions, is that the choice of glasses is hardly limited, and less lenses are necessary to obtain good spherical correction even in types of high aperture.

This double advantage of the new objective is due to the use of two pairs of glass surfaces, each pair consisting of two surfaces, which face one another, that is to say, which belong to two consecutive lenses,

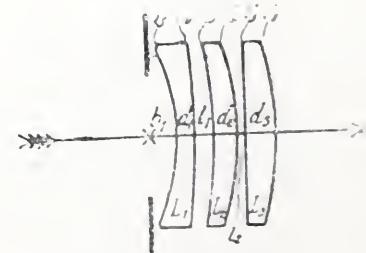


Fig. 1.

and are separated by an air-space, but not by the diaphragm of the system, and the powers of both pairs being of opposite sign.

If n_1 and n_2 be the refractive indices of the two consecutive lenses, r_i and r_k the radii of curvature of the glass surfaces facing one another, the power of such a pair of surfaces is given by

$$\phi_{1,2} = -\frac{n_1 - 1}{r_i} + \frac{n_2 - 1}{r_k},$$

the axial thickness of the air-space between both "facing" surfaces being supposed to be negligible.

There exist already several photographic objectives having two pairs of facing glass surfaces separated by air, but the powers of these pairs

are both positive or both negative. It may be inferred from fig. 3 of Specification No. 27,635, A.D. 1896, relating to the so-called Planar, that the two pairs of facing glass surfaces are the surfaces r^1_4 , r^1_3 and r_3 , r_4 of the lenses L_3 , L_2 and L_2 , L_3 respectively. The sign of the power of each pair is positive. Another construction of this kind has been described in Specification No. 12,859, A.D. 1898. This objective is composed of four separate parts and contains—according to the data given in M. von Rohr's "Theorie und Geschichte des Photographischen Objectivs," p. 392—two pairs of facing glass surfaces, each of which pairs has a negative power.

The effect of combining two pairs of facing surfaces of opposite power is similar to the result obtained in the objective described in Specification No. 6028, A.D. 1890, by the opposite sign prescribed for the difference between the refractive indices of the crown and flint-lenses in the cemented components of a doublet. The pairs of facing surfaces produce, in accordance with the signs of their powers, astigmatic differences of opposite character, so that, in addition to spherical correction of the whole system and flattening of the image, astigmatism may fully be corrected. In the former objective the maximum differ-

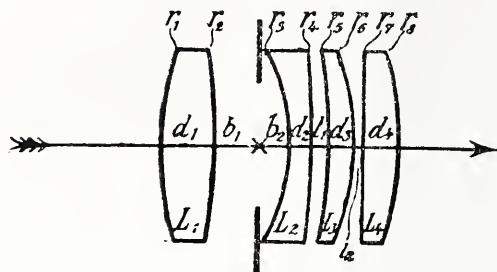


Fig. 2.

ence of the refractive indices of the lenses cemented together was (with regard to practical usefulness of the glasses) $1.63 - 1.50 = 0.13$. In the present objective, however, the difference of the refractive indices belonging to each of the facing glass surfaces will amount to $1.50 - 1.00 = 0.50$ even in the most unfavourable case. It is further to be considered that when the present objective has the same number of lenses as the former, its number of elements available for correction is increased, so that the present objective when consisting of four lenses presents a surplus of two radii and two air-spaces. From the foregoing it will be understood that the adoption of the new type of objective will result either in larger apertures, the spherical corrections remaining of the same quality, or—when the apertures are unaltered—in improved spherical corrections.

Besides the two pairs of facing glass surfaces of opposite sign the well-known means of correction may be employed at will, and in consequence therof the new objective may consist of single lenses as well as of cemented lens systems. Moreover, it is an essential feature of the invention that the selection of kinds of glass is nearly unlimited, so that glasses which diminish the secondary spectrum may be used, although their optical properties vary in very narrow limits only.

The features of the invention may be realised either in "simple

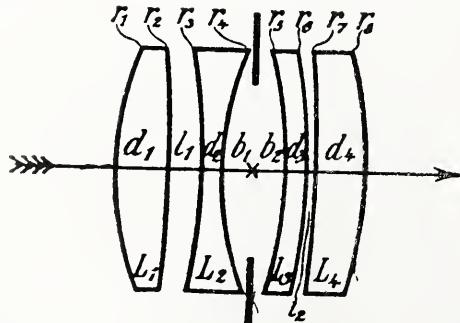


Fig. 3.

objectives" (objectives having their diaphragm behind or in front of them), or in "doublets" (objectives in which the diaphragm is placed in the system).

In the annexed drawing:

Fig. 1 represents a simple objective constructed according to the invention.

Fig. 2 represents a doublet, one of the two components of which is constructed according to the invention.

Fig. 3 represents a doublet constructed according to the invention.

Fig. 4 represents another doublet constructed according to the invention.

Fig. 5 represents a third doublet constructed according to the invention.

The most primitive simple objective consists of three single lenses L₁, L₂, L₃ placed separately as shown in fig. 1. One pair of facing glass surfaces is formed by the surfaces r₂, r₃ of the lenses L₁, L₂ and the other by the surfaces r₄, r₅ of the lenses L₂, L₃. For each of the single elements L₁, L₂, L₃ a compound lens or a non-cemented lens system may be substituted, whereby the construction of the simple objective becomes more or less complicate.

Such a simple objective may also advantageously be used as a component of unsymmetrical as well as hemi- or holosymmetrical

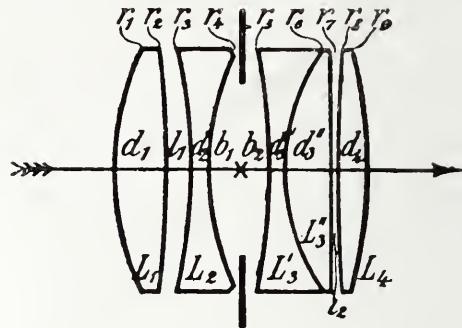


Fig. 4.

doublets. The most primitive kind of an unsymmetrical doublet, a component of which is a simple objective constructed according to the invention, is shown in fig. 2. It consists of four lenses L₁, L₂, L₃, L₄, the back component L₂+L₃+L₄ being the simple objective shown in fig. 1. But it will be understood that the simple objective may also be used as the front component of the doublet.

The most primitive doublet, which in its totality is constructed according to the invention, has two lenses in front of the diaphragm and two lenses behind it as shown in fig. 3, the two pairs of facing surfaces being placed on different sides of the diaphragm. The surfaces r₂, r₃ of the lenses L₁, L₂ form the one pair having positive power, and the surfaces r₆, r₇ of the lenses L₃, L₄, the other pair having negative power. The lenses L₁, L₂, L₃, L₄ may be single lenses, as shown, or compound lenses. It will be preferable to substitute compounds for some of the single lenses either for the purpose of remaining within certain limits as to the choice of glasses or for obtaining certain effects as regards the correction of chromatic or spherical aberrations. According to the particular purposes of each doublet the elements of such a composite lens may be made of glasses having the same refraction and different dispersion, or the same dispersion and different refraction, or different refraction and different dispersion.

In fig. 4 a more complicated doublet is shown, which has been developed from the doublet represented in fig. 3 by substituting two elements L¹₃ and L¹₃ cemented together for the lens L₃. Example

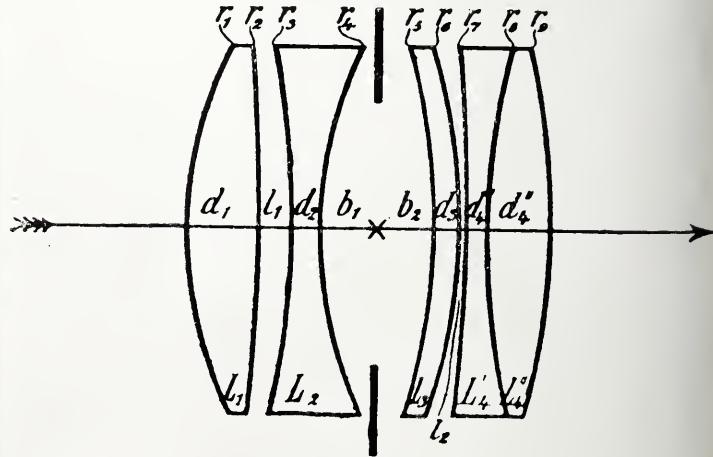


Fig. 5.

3 given below, and showing detailed data of construction, refers to the same fig. 4. In this example L¹₃ and L¹₃ are ground from glasses having the same refraction, but different dispersion, so as to chromatically correct the whole system.

Finally, in fig. 5, a construction is represented in which for the lens

of fig. 3 a compound consisting of L_1^4 and L_2^4 has been substituted. In the example 4, which gives detailed data of construction in reference to fig. 5, glasses of different dispersion and different refraction have been selected by means of which the chromatic correction as well as the diminution of the spherical zones are obtained.

In the following numerical examples of objectives constructed according to the invention the letters L_1 , L_2 . . . denote the lenses; b_1 , b_2 . . . their axial thicknesses; r_1 , r_2 . . . the radii of curvature of their spherical surfaces; b^1 , b^2 the distance between the diaphragm and the adjacent lens vertices; l_1 , l_2 the axial thicknesses of the air-spaces between two lenses (the distance between two lenses). The radii, thicknesses, diameters and distances are expressed by proportional numbers, the unity of which is the focal length of the entire objective. By simply multiplying these numbers with the focal length required in each case, the data of construction for any objective wanted will be obtained. The different kinds of glass are determined by their refractive indices n_D , n_F , n_G , relating to the D-line and the F-line of the solar spectrum and to the H γ line of the hydrogen spectrum respectively. The value of $\frac{\Delta n}{n_D - 1}$ indicates the relative dispersive power of the kind of glass, Δn being given for the interval between D and H γ , whereas by the quotients

$$\frac{n_F - n_D}{n_G - n_D} \text{ and } \frac{n_G - n_F}{n_G - n_D}$$

the increase of the dispersion in the considered interval is shown.

Our Editorial Table.

OUR BIRD FRIENDS.

By R. Kearton, F.Z.S., with 100 illustrations from photographs by Cherry Kearton
Crown 8vo.; cloth gilt; 5s. London: Cassell and Co., Ltd.

In the last of his bird books, Mr. R. Kearton has written not by any means the least entertaining of the delightful series of volumes with which the names of his brother and himself are associated. He talks to us in simple language, which young people will enjoy, and their seniors not rebel at, of the bird at home—of his “tricks and his manners,” as Dickens’s Jenny Wren puts it. To quote from the Publisher’s note: “The wonders of feathers and flight; remarkable nests of different styles of architecture; eggs and the value of their shape, size, colour, and numbers; the care and protection of young; feeding habits; and remarkable songs and call notes,” are lovingly touched on in Mr. Kearton’s chapters. His keenness of observation and his sense of humour stand him in good stead in enabling him to penetrate with wonderful zest the charm, the interest, and the beauty of bird life. We cannot imagine any hitherto heedless person taking up this book and reading it and failing to become at once a lover of birds. The hundred or so illustrations are from photographs by Mr. Cherry Kearton, who has made this branch of work a speciality. He is to be congratulated on the really wonderful skill and patience he must have expended in order to secure his negatives. For example, an opening the book at random we light upon photographs showing “A Baby Jackdaw’s First Peep into the World,” “Merlin’s Nest with Newly-hatched Chick,” “Blue-tit feeding on suspended kernel of nut,” and so on. The combination of photographic skill with a perfect genius for seeking such subjects, or, indeed, for conceiving them, is a dual gift of which we sincerely envy Mr. Kearton. We thank both author and photographer for a fascinating work, which is full of the well-recorded results of efforts in the service of a part of the world of nature upon which the human eye invariably rests with delight. As a Christmas and New-year’s gift-book “Our Bird Friends” will, no doubt, be immensely popular. It well deserves to be.

THE RAINBOW PLATE.

Manufactured by the Warwick Dry Plate Co., Warwick.

GOOD-KEEPING qualities are claimed for the Rainbow Plate, which is made in two rapidities, Fast (Wynne’s Meter 90) and Slow (Wynne’s Meter 45). Some of the plates have been in our possession for several months, and on recently testing them we found that they worked quite cleanly, and without any degradation of the deposit. As a means of testing their colour sensitiveness, we chose the following plan: In place of the lens on the front of the camera we fixed a small pocket spectroscope, and, pointing the camera to a clear part of the sky, photographed the spectral band so obtained. This rough and ready method of testing showed that the “Rainbow” plates had been made fairly sensitive to the red, a region of the spectrum which uncorrected plates do not, of course, render so satisfactorily as could be wished. We might mention that this method of spectroscopically testing the sensitiveness of plates is a very useful one for purposes of making comparisons, especially with non-corrected plates whose rapidity it is desired to ascertain. Again, in place of the spectrum itself, an arti-

ficial spectrum made of selected pieces of glass and photographed by transmitted light, as one copies a negative or transparency, also affords a system of testing plates, by which a very good idea of their adaptability for translating colour may be obtained. The Rainbow plates appear to be carefully prepared, and are very fine in the grain.

THE AGFA REDUCER.

Agents: A. and M. Zimmermann, 9 and 10, St. Mary-at-Hill, London, E.C.

The samples of the Agfa reducer which Messrs. Zimmermann sent us reached us in the form of 10 gramme cartridges, the salt itself having a slightly greenish tinge of colour. We found the quantity named freely soluble in 100 c. c. of water (about 3½ ounces). In order to test the reducing powers of agfa, we selected a negative of a church interior, the highest lights of which—windows—were excessively dense. The reduction proceeded slowly, but harmoniously, and in the result we found that it had taken off sufficient of the deposit in the windows to make the detail hitherto buried in them printable and recognisable, without unduly diminishing the remaining parts of the negative. We noticed that agfa—which is said to be a combination of a ferric salt and an alkaline thiosulphate—had no staining effect. This reducer is also recommended by the manufacturers for bromide prints and lantern slides. It is directed that the salt, as well as the solution, should be protected as much as possible from the daylight. To the occasional worker the agfa reducer in cartridge form should be of very great use, for the convenience of the latter obviates the necessity of making up and retaining special solutions of mercury or other substances for purposes of reduction.

THE PAGET HANDBOOKS.

Published by the Paget Prize Plate Company.

We have received from the Paget Prize Plate Company a set of the series of the little handbooks issued to users of their plates and papers. These are entitled Paget Prize Plates, and how to use them, by Mr. W. J. Wilson, F.C.S.; Paget Prize Lantern Plates, by Mr. S. Herbert Fry, F.R.P.S.; and Paget Prize P.O.P., by Mr. Wilson. There is also a list of exposure tables for use with the plates. These little books are written by men of sound practical knowledge, and, as they are issued gratis, they should be in the hands of all users of the Paget Company’s world-renowned productions.

Studio Gossip.

OUR bright contemporary, “M.A.P.,” prints the following two photographic stories in its last issue:—The Queen and the Photograph. Here is a new and characteristic story about the Queen. She commanded the young widow of a certain major of the Artillery, who had fallen in South Africa under peculiarly sad conditions, to visit her at Windsor: she also asked to see the baby—a posthumous child—to whom she had consented to act as godmother. When her visitors were leaving, the Queen expressed a wish to have their photographs, with that of the deceased officer. The widow, with extraordinary lack of taste, had her photograph taken in full evening dress. It was returned by Her Majesty.—The Cost of a Duke: My Northern correspondent writes: “I have lately come across a little story of the Duchess of Montrose, whose beauty is no less renowned than her philanthropy. The scene was a bazaar where the Duchess was selling photographs. One old Scotch ‘buddy’ of the more frugal sex was very anxious to secure a photograph of the Duchess; but the price asked was five shillings. The old woman hesitated: she wanted the photograph, but she could not well afford so much. ‘You can have my husband,’ said the Duchess, with an amused glance at the duks standing near, ‘for two-and-sixpence.’ The would-be purchaser looked at the Duke and then at his photograph contemptuously. ‘Half-a-crown’ she blurted out. ‘I wouldn’t give a silver sixpence for him. But,’ she added insinuatingly, ‘I’m right willing tae give hauf-a-crown for your bonnie sel’. The Duchess was unable to resist this, and herself added the other half-crown to the bazaar coffers, or, as another version of the story goes, the despised Duke proffered the balance.

News and Notes.

ROYAL Photographic Society.—Ordinary Meeting, Tuesday, December 11, at 8 p.m. The Atmospheric Gas Company will demonstrate a new method of lighting. Mr. H. Snowden Ward will show some recent results by the McDonough-Joly colour process.

A LANTERN explosion of acetylene gas recently took place at Austin, Illinois. An entertainment was being given in the First Presbyterian Church, and the operator, who had recently returned from missionary work in India, lost his right hand and sustained other injuries. The gas was in cylinders, and one of them sprang a leak, and the light that was in the lantern ignited it, causing the explosion. The middle tier of seats, where the tanks had been placed, was wrecked, and the large windows were blown out. The fire was extinguished.

LORD KELVIN on Polytechnics.—Last week Lord Kelvin presented the awards at the Birkbeck Institution, and afterwards spoke briefly to the students, the distinguished scientist disclaiming any intention of "delivering an address." The primary object of the institution, explained the great physicist, was not to teach men and women how to earn a livelihood, but rather to make life more worth living to those who were already earning a livelihood. The example of Dr. Birkbeck had led to the formation of polytechnics and athenaeums throughout the country, all seeking to feed the mind of their students with wholesome food, and to render the possessor of the food happier and better and more useful to the world. Such a marked change, he urged, could not fail to be beneficial to England and her vast Empire.

BOROUGH POLYTECHNIC PHOTOGRAPHIC EXHIBITION.—The Sixth Annual Exhibition of the Borough Polytechnic Photographic Society will be held at the Institute, 103, Borough-road, S.E., on Thursday, Friday, and Saturday, December 27, 28, and 29, 1900. As previously announced, this year's exhibition will consist solely of the work of members of the Society. With a view to popularising photography, it is noticed that the whole of the exhibition will be thrown open to the public free, and, as a further appeal to the lay mind, a large number of side attractions are being introduced. These include a good show of photographic apparatus and accessories by the trade, a special exhibit of natural colour photographs, lantern entertainments, and frequent displays of animated photographs, X rays, wireless telegraphy, &c., whilst a special feature will be made of short popular demonstrations of photographic processes. The judges for the exhibition will be Messrs. John A. Hodges, H. Snowden Ward, and Chas. H. Oakden.

PHOTOGRAPHY AND MODERN ILLUSTRATION.—In the making—in the manufacture, we may say—of handsome "Art" books the publisher of the present day is exceeding skilled. Lacking the "flair" that might enable him to discover original talent and the sympathy necessary to utilise it, he plunges, says a writer in "The Outlook," camera in hand, into the storehouses of the past, returning with an album of beautifully printed blocks, pieced out by a running accompaniment of more or less critical appreciation. Thanks to this practice, the demand for illustration of serious artistic quality is as small as its supply, and even picture-buyers of limited means have come to prefer photographs of famous pictures by Velasquez or Rembrandt to "the real thing" by artists of more modest merit. To an admirer of a famous picture the first sight of its photograph revives the memory of the thing itself almost to illusion. Unfortunately, as the experiment is repeated the illusion weakens, and, if the thing be persisted in, it has this effect, that when you next go to see the painting itself you are irresistibly reminded of the photograph. This preference for photographs of the art of other centuries over real art of one's own is a characteristic of our generation, which always prefers its sensations let down, which will pay a shilling to see a jerky, colourless cinematograph of something a hundred miles away, though by so doing it misses the full-blooded reality at hand—nay, will often stop to see a photograph of what if seen in nature would be passed by unheedingly.

Commercial & Legal Intelligence

MOUNTS FOR CHRISTMAS AND NEW-YEAR CARDS.—As usual at this time of year, Mr. Jonathan Fallowfield, of 146, Charing Cross-road, London, W.C., is issuing a special illustrated price-list of motto mounts for Christmas and New-year.

We are informed that H.R.H. the Grand Duke of Hesse has conferred upon Dr. Louis Merck the distinction of "Geheimer Commerzienrat," in recognition of his great services to the chemical industry of Germany. H.R.H. has further conferred upon Dr. E. A. Merck the distinction of "Medicinalrat," in recognition of his services rendered in connection with the Chemical Exhibition at the World's Fair of Paris, 1900.

An effort is to be made to employ colours in the illustration of sporting subjects in the "Badminton Magazine," says the "Daily Chronicle." At first these must be in the nature of an experiment, but the hope is that in time it may be possible to employ colour whenever a picture needs it. As the editor remarks, "The plumage of a bird, the skin of an animal, the scales of a fish cannot be realised from any monochrome representation, colour being one of the most essential elements." The difficulty in the past has been that all known processes of colour printing have been too elaborate and expensive for the periodical press, if carried out in really artistic style. Recent inventions in printing and photography have cheapened the cost, and, moreover, good results are now more certain.

At the opening of the series of eight special evening lectures at the handsome premises of "Kodak," Limited, at 96, Bold-street, Liverpool, a very popular innovation was initiated by their manager, Mr. J. Phethean, M.P.S. In the lecture and demonstration on Eastman's platino-matt bromide paper enlargements were made from the visitors' own negatives and afterwards called for. Owing to the number of visitors who could not be accommodated at the first lecture, it had to be twice repeated. Many hearty expressions of interest and thanks were tendered. Another interesting feature was the exhibition of choice lantern slides at the conclusion of the lecture. The free lectures and demonstrations are proving extremely popular, and show that "Kodak," Limited, goes beyond mere business considerations and is doing good work by providing these interesting and educational lectures and demonstrations.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
10.	Bognor	{ Demonstration: <i>The Combined Toning Bath.</i> Dr. Tidecombe.
11.	Aintree	{ Demonstration: <i>Plate-making.</i> Mr. Gerrard.
11.	Birmingham Photo. Society ..	Prize Lantern Slides.
11.	Rotherham	{ Demonstration: <i>Thornton Films.</i> W.D. Welford.
11.	Thornton Heath	Lantern Night.
12.	Birmingham Photo. Society ..	Extraordinary General Meeting.
12.	Borough Polytechnic	<i>Photography at the Zoo.</i> W.H. Wilshire.
12.	Oroydon Camera Club ..	Fifty-second Public Lantern Show.— <i>The Home and Haunts of Charles Dickens.</i> Rev. C.H. Fielding.
12.	Manchester Amateur	<i>Spain and Morocco.</i> R. Child Bayley, F.R.P.S.
12.	Sefton Park	<i>Process Work.</i> Richard Brown.
13.	Bootle	{ <i>Rivers, Glens, and Waterfalls of Scotland.</i> D.J. Neill.
13.	Hull	{ <i>Films v. Plates, and the New Thornton Film.</i> W.D. Welford, F.R.P.S.
13.	Liverpool Amateur	<i>The Nile.</i> R. Talbot Kelly, R.B.A.
13.	Manchester Amateur	<i>Slide-testing Night.</i> P. Hancock.
13.	Woolwich Photo. Society ..	{ <i>Toning Prints.</i> G. Tapp.— <i>Bromide Paper.</i> F.W. Machen.— <i>Velox.</i> A. Lees.— <i>Platinum.</i> J.B. Panting, F.R.P.S.
14.	Aberdeen	<i>Architecture.</i> F.W. Hardie.
14.	Borough Polytechnic	Instruction Evening: <i>Olla Podrida.</i>
15.	Woolwich Photo. Society ..	Annual Dinner.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 27.—Technical Meeting,—Mr. J. J. Vezey in the chair.

ANALYTICAL PHOTOGRAPHY.

Mr. Francis Galton, F.R.S., delivered an address upon the subject of some experiments which he has recently made to isolate the particulars in which one photograph differs from another of a different aspect of the same original. As the object in view is the separation or analysis of the expressions or variations of the subject of the several photographers, he has called the process "Analytical Photography." The principal results of his experiments were published some few months ago in "Nature," and the article was reprinted in THE BRITISH JOURNAL OF PHOTOGRAPHY for August 10 last. Mr. Galton's lecture was delivered extempore, and, as it was of a somewhat discursive character, we prefer to refer our readers to that issue for a succinct and detailed account of his investigations and their outcome. In his opening remarks, he explained that when, in 1881, he submitted to the Royal Photographic Society his now well-known method of composite photography, the idea occurred to him that a converse process might be contrived. In composite photography a number of different portraits are impressed successively upon the same sensitive surface, giving to each only a proportionate fraction of the total exposure, the result being that what is common to all is retained, while that which is individual—or is seen in one of the several portraits—is lost. In analytical photography, on the other hand, the object is to dissect a composite so as to show what is individual. For this purpose the starting point is the fact that "the superposition of a rather faint positive upon its rather faint negative produces an approximately uniform grey when they are viewed together as a single transparency." If, then, negatives and positives are made of different aspects of the same subject—for instance, a sitter with a serious expression and the same subject with a smile—and if the transparency of the latter is superposed upon the negative of the former, the characteristic lines of the smile will be isolated from the whole of the features. That is to say, what is common to both will be blended in the uniform grey, while the "smile," which differentiates one from the other, will be separated out. Mr. Galton exhibited the very ingenious apparatus which, with the aid of Mr. T. R. Dallmeyer, the President of the Society, he had devised for working the process, and he expressed the opinion that it would be of value to artists and physiologists in the determination of the great changes which really occur in apparently trifling differences of expression or development.

COMING EVENTS.

On Dec. 11, the Atmospheric Gas Company will show a new system of artificial lighting for portraiture, which members are invited to test with their cameras; and Mr. H. Snowden Ward will read a paper upon, and give illustrations of, the Macdonough-Joly process of colour photography. At the Technical Meeting, on Dec. 18, Mr. H. C. Shelley, war artist of "The King," will read a paper on "Photography in Warfare."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 29.—Mr. R. J. Kindon in the chair.

Mr. Philip Everitt said that it would be remembered that Mr. T. R. Dallmeyer showed, on the occasion of the first Traill-Taylor Memorial Lecture, which was delivered by him two years ago, an instrument for measuring the focus of a lens. Mr. Everitt had recently made use of the focometer, now installed at the Royal Photographic Society's rooms,

and had measured a Zeiss Unar lens of 210 mm., or 8.2679 inches focus, and a Steinheil orthostigmat of 9 cm., or 3.5434 inches focus. He found that the Unar measured on the focometer 8.235 inches—showing a difference only of 1-30th inch; and the orthostigmat 3.5184 inches—showing a difference of 1-40th inch. It was interesting, he thought, to note that opticians should send out lenses marked so very nearly to the exact focal lengths as proved by the two tests described.

Mr. A. Haddon sketched on the board, and explained a condensing apparatus new to him, and possibly also to many of the members. It must have occurred to many at times that alcohol of a little greater strength than that usually obtainable would be very useful, or a means of removing impurities, and if this could be done without infringing any of the laws of the realm so much the better. Stills, whether they consist of a worm or Liebig's condenser, are usually cumbrous; but this apparatus was very small, yet condensed well and rapidly.

Without an illustration, a perfect idea of the condenser cannot be given. It consists of two glass tubes, one within the other, fused together at their upper edges. The vapour of the liquid to be purified is introduced by means of a branch piece between the tubes, and cold water is allowed to play upon the condensing surfaces. The condensed vapour then trickles through an outlet at the bottom, while the water is conveyed away in another direction. The condenser is supplied by Messrs. Baird and Tatlock.

Mr. H. C. Rapson, remarking that a great deal had been said and written against the permanence of sulphur-toned prints and slides, showed some lantern slides to disprove assertions that of necessity sulphur toning was unreliable. The slides shown for comparison were gold toned and sulphur toned respectively. They had been exposed for twelve months in the studio, and the sulphur-toned slide was still good, while the gold-toned slide had gone off somewhat.

Mr. A. Mackie agreed that it was not at all a matter of course that sulphur toning was unreliable. Want of permanence could easily be contrived in sulphur toning, but, on the other hand, excellent results could as easily be secured. The usual method of sulphur toning, by decomposition of hyposulphite of soda, was not calculated to afford permanent results.

Mr. P. Everitt said that years ago Sir W. de W. Abney had pointed out that there was no reason to suspect the keeping qualities of images composed of silver sulphide.

Mr. J. E. Hodd spoke of some trials of the developed P.O.P. process with which he had succeeded very well. He promised a demonstration of the method, and said that he employed the following formula for development:—

Hydroquinone	12 grains.
Citric acid	30 grains.
Acetate of soda	6 drachms.
Water	15 ounces.

The paper was not bromised prior to development, but must, of course, be fresh and not exposed to strong daylight before putting in the frame. He printed until detail was just visible in the high lights; short of this the prints would be hard.

Mr. Haddon remarked upon the better quality of the half-tone developed prints compared with printed-out images, and instanced the fine prints shown some time ago by Mr. Bullen and Mr. Mayall.

A discussion ensued on gold toning, relative to the quantity of gold per sheet required, and the time in which large batches could be finished.

PHOTOGRAPHIC CLUB.

NOVEMBER 28.—Mr. Geo. E. Brown in the chair.

Mr. John Gunston gave a very interesting lantern lecture on Switzerland, as seen by the tourist in contradistinction with the mountaineer. With a start from Lucerne, he took his audience over the Brunig railway, through Brienz and the lake of that name, calling at the many delightful little waterside villages on the way to Interlaken. Here views of the famous Jungfrau were obtained, and the journey resumed into higher altitudes. From Murren some fine mountain views were obtained, the snow and ice and cloud effects being particularly well rendered. The Rhone glacier and the great Matterhorn received considerable attention by the lecturer, whose series of pictures was such as to convey an excellent idea of the magnitude and grandeur of Swiss mountain scenery. Mr. Gunston subsequently stated that for snow views he invariably used Edwards' isochromatic plates, with a light yellow screen. For some of the views films were employed. The exposure for a view of snow-clad landscape with foreground and sky at f-22 would under these circumstances, with the slow plate be about one-half to one second, the yellow screen increasing exposure about three times. With the instantaneous brand a sixth or a quarter of a second would be about right.

A vote of thanks was passed to Mr. Gunston.

Liverpool Amateur Photographic Association.—The ordinary monthly meeting of the Society was held on Thursday, 29th ult., the President, Mr. John H. Welch, in the chair.—The business of the meeting having been disposed of, Mr. Richard F. Soper was called upon to deliver his lecture, "An Easter Pilgrimage to the Shrine of St. Lawrence," being an account of the Society's Easter excursion to Ludlow. The lecture was illustrated by slides contributed by members of the party, and was greatly enjoyed by the large audience assembled. A vote of thanks to the lecturer, proposed by Dr. Thurstan Holland (one of the pilgrims), terminated the proceedings.

Newcastle-on-Tyne and Northern Counties Photographic Association.—On Tuesday night, November 27, Mr. W. Parry read a paper on "Instantaneous Photography" before a large audience of members of the above

Association, their friends, and members of the Young Men's Christian Association. He began with a short sketch of the history of photography, tracing it from its earliest conception, almost from the time when it was first noticed that the human skin was darkened by exposure to the sun, to the present day, when such rapidly-moving objects as bullets after being fired, and torpedo-boats travelling at 41 miles an hour, were portrayed on the screen. The lecture was pithily interspersed with humorous remarks and anecdotes, and the majority of the slides being shipping views, were relieved with those of babies, both laughing and crying, showing some of the trials of a portrait photographer in spite of quick plates. Many of the slides shown were those of Mr. Parry's famous "Warships going at full speed," and were magnificent examples of instantaneous work, whilst those made by combination printing were marvels of technical skill, the join between the two negatives not being visible even when Mr. Parry showed where it was. Some of the portraits shown, where the background had been removed to give a statuesque effect, were most pleasing. Several examples of shutter work by other members of the Association brought a most enjoyable and instructive evening to a close. The slides were shown by the Rev. J. W. Ogden, F.R.G.S., with his magnificent triunial lantern.

Patent News.

THE following applications for Patents were made between November 19 and November 24, 1900:—

FOCUSING DEVICE.—No. 20,860. "An Improved Focussing Device for Photographic Cameras." H. HOLMES and G. HOUGHTON.

RETOUCHING DESK.—No. 20,861. "An Improved Photographic Retouching Desk." P. F. COGGIN.

CAMERAS.—No. 20,862. "Improvements in Photographic Cameras." F. H. SANDERSON.

VIEW-FINDERS.—No. 20,863. "An Improved Adapter for Photographic View-finders." G. HOUGHTON and W. A. EDWARDS.

ELECTRIC LAMPS.—No. 20,868. "Improvements in Electric Lamps for Use in Photography." J. SCHMIDT.

CAMERAS.—No. 20,932. "Improvements in Roll-holding Cameras." Complete specification. P. RUDOLPH and O. NÄTHER.

SHUTTERS.—No. 20,933. "Improvements in Photographic Shutters." E. DÖNITZ.

PRINTING-FRAME.—No. 21,034. "Apparatus for Printing Photographs from Negatives." F. W. SUTER.

CAMERAS.—No. 21,239. "Improvements in or relating to Photographic Cameras." E. S. SHEPHERD.

HAND CAMERAS.—No. 21,279. "Improvements in and relating to Hand Cameras." Complete specification. A. C. JACKSON.

FORTHCOMING EXHIBITIONS.

1901.

January 14-19 Blairgowrie and District Photographic Association.

The Hon. Secretaries, Blairgowrie, N.B.

February 16-March 9 Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 10a, George-street, Edinburgh.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

C.I.V. PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—I noticed in your JOURNAL soon after the S.A. War started that some photographer in town had taken the C.I.V.'s free of charge, and presented them with copies of their photos. This I did directly the war started to all who were going to the front, and advertised same in the local papers. The sequel came last Friday, when all our local C.I.V.'s and Sergeant Engleheart, V.C., were entertained at a banquet in the Town Hall, Barnet, when I prepared and gave away to each of the diners and guests a souvenir in the shape of a photograph containing all their photos, and suitably inscribed. In all there were about 250. The guests and C.I.V.'s, &c., numbered 50, and they had photos 8x6, and the others cabinet size. I enclose you a rough copy of the small ones. I think you will be pleased to hear that I was complimented on having given them, and received a vote of thanks at the dinner.—I am, yours, &c.,

ALBERT ENGLAND.

The Studio, Triangle, New Barnet.

[The copy enclosed includes ten named members of the C.I.V. It is an excellent print, and, no doubt, the souvenir will be prized by those to whom it was presented. Eds.]

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:

A. J. Lovell, 27, Wellington-row, Brackenthwaite, Whitehaven.—Photograph of pencil drawing of the Earl of Lonsdale.

FERROTYPE.—W. BILLING. Ferrotype plates for the wet collodion process, and all the necessary materials for working it, can be obtained from Fallowfield's, Charing-cross-road.

JOHN ROBINSON.—Yes; an advertisement in the JOURNAL would best suit your objects. The Continental and American journals would, we think, not be of much use to you.

CANARY MEDIUM.—S. ROME. A fish tail burner, shielded by two thicknesses of canary medium, will form a perfectly safe dark-room light. But it will not be sufficient if orthochromatic plates be employed. With them a ruby light is necessary, and even with that the plates should not be exposed too close to it until the image is well out.

THE COPYRIGHT UNION.—"COPY" writes: "Can you give me particulars of joining the Copyright Photographic Union, or could you put me in communication with the Secretary of the society?"—In reply: Address the Secretary of the Photographic Copyright Union, Mr. H. Gower, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

DISPUTED AGREEMENT.—"IN DOUBT." We have read through the copy of the agreement you enclose, and from it we opine that your reading of it is correct. But, as the whole business seems somewhat complicated, we should advise you to submit it to some solicitor in your neighbourhood. Take his opinion, and act according to it, as, to us, one or two of the clauses seem somewhat vague.

RENDERING CALICO NON-INFLAMMABLE.—"BOBS" writes: "I have some calico hanging in the studio, which is liable to catch fire. Can you tell me in what solution to steep it, and thereby render it non-inflammable?"—In reply: Steep the calico in a solution of tungstate of soda and hang up to dry. A solution of alum will also render the fabric non-inflammable, but the tungstate of soda is the best.

SPOTS ON FILMS.—A. C. W. says: "Herewith please find three negatives made on a rollable film. You will see that, though much under-exposed, the skies are covered with spots. The camera was carefully dusted before the film was used, and it was dusted again before it was developed, so I am pretty certain that the spots were not due to dust."—In reply: We have little hesitation in saying that the spots are due to the emulsion. Send one or two examples to the makers of the film.

COPYING PAINTINGS.—J. WARDLOW asks the following question: "In copying an oil painting, using orthochromatic plates, is it necessary to use so deep a yellow screen, when the light itself is yellow, as when there is a bright summer light. Because, if a lighter tint could be used, and the same result obtained, the exposure would, of course, be shortened?"—In reply: If the light is very yellow a paler yellow screen will suffice. Indeed, if the light were yellow enough, no screen at all need be used.

THE ELECTRIC LIGHT IN THE STUDIO.—"INQUIRER" writes: "I am having electric light fitted in my studio, and should be greatly obliged if you would inform me which is the best system, the incandescent or arc lamp. Is it expensive to work after fitted?"—In reply: Both systems are good. The arc is best adapted for a continuous current and the incandescent for the alternating. The light, when installed, is not very expensive in working, but that, of course, depends upon the price charged for the current.

WINTER SNAPSHOTS.—"RUSTIC" says: "I am going to spend a few weeks in London shortly. Will you please say whether, if I bring a hand camera with me, it will be possible to get a few snapshots of London streets?"—In reply: Well, all depends upon circumstances. If the light is good—exceptionally good for this season in London—and the plates used are very rapid ones, and the lens will cover with a large aperture, the thing is quite possible. But the work, even then, must not be attempted with extremely rapid exposures.

MUDGY PLATINOTYPE PRINTS.—GEO. MERTON sends some platinum prints, and asks the cause of their muddiness, adding that he has followed the instructions to the letter.—In reply: The cause of the trouble is that the paper has been exposed to damp, and so absorbed moisture. At this season of the year the atmosphere is very moist, and greater precautions against it are now necessary than was the case during the dry summer weather. The remedy is obvious—don't expose the paper to the air, and keep the pads of the frames perfectly dry.

FAULTY LIGHTING.—"A. L." says: "I send herewith six cabinet portraits, which are of the general average of my work, and I am not pleased with it because it is not so good as that done by another photographer in the town. His portraits all look rounder and seem to stand out more than mine do. I shall be obliged if you can give me a hint or two."—In reply: The fault with the portraits is that they are all illuminated with too much direct front and top light. Subdue both, and use a stronger side light. If you do that the pictures will be much improved.

CENTRING LIGHT IN LANTERN.—C. WATSON writes: "I have one of —'s lanterns (limelight), but with it I cannot get an evenly-illuminated disc on the screen. A friend, from whom I bought it, got excellent results. Can you tell me how to do the same?"—In reply: In the first place, see that the point of light is exactly in the optical axis of the optical system. That being secured, move the light backward and forward until the disc is evenly lighted. Cannot you get your friend to give you a practical lesson in the use of the instrument? It would help you more than any written instructions we can give you.

COPYRIGHT.—"S. O. L. D." writes: "Last year I was commissioned to take a dozen views of the district to illustrate a small history of the place. I supplied prints which have been used for the work. Nothing was said about the copyright. Now the one for whom I did the work has sold his business, and the block with it. Can I prevent the purchaser from using them if I now make the pictures copyright, as I was the author of them?"—In reply: No, you cannot. You were paid for your work, to enable the blocks to be made, and, of course, they are the property of the purchaser to do what he likes with them.

PHOTOGRAPHS ON WATCH DIALS.—"J. R. S." writes: "I shall feel greatly obliged if you or any of your readers will kindly supply me with particulars regarding the process of transferring photos on to watch domes."—In reply: We presume our correspondent means fixing the photographs into the enamel. If so, there are two or three different methods of doing it. The powder process is the one that is generally followed. Space in this column is, however, too limited for giving working details of the process. A pamphlet on the process is published by Dawbarn and Ward, Farringdon-avenue, which gives full working details. Better get that.

SCRATCHED MIRROR.—G. CROSS writes: "I have been trying to do some process work, and the other day, in re-polishing the mirror, which had become tarnished, I managed to get two or three small scratches upon it. They run longitudinally, and are very fine; probably they were caused by a particle of grit on the polishing pad. Will they, as they are very fine, materially impair the working of the mirror, as I do not care to go to the cost of re-silvering it unless it is absolutely necessary, as I am only experimenting at present?"—In reply: The scratches will do no harm whatever. They will only cause a small—very small—loss of light. The quality of the mirror is not impaired at all, as you will find in working.

COPYING TAPESTRY.—"PUZZLED" writes: "I am wanted to copy two pieces of tapestry. They are about ten feet by seven, but they must be done as they are, fixed to the wall. One end of them is more strongly lighted than the other. The pictures have to be ten inches long. Can you tell me of any means by which the light on the two ends can be better equalised in the negative than it seems to be on the originals?"—In reply: In a similar case that we know of, the difficulty was overcome in this way: The plate was exposed for the time necessary to get the best lighted portion fully exposed, then some magnesium was burnt, after the blinds were pulled down to sufficiently light up the darker portions, and the result was good.

PRINTING ON SILK.—"ENTERPRISE" asks: "What is the reason of the outer edges of the sensitising on a silk handkerchief stained by silver marks, although it has not been exposed to light? I followed somewhat the instruction given in your issue a fortnight since. I think it a very beautiful process and very simple to work, but this is a drawback. Would a solution of cyanide of potash remove the stains? If so, what strength?"—In reply: The cause of the staining is that the silk contained some matter that reduced the silver. It was not washed perfectly clean to begin with. The stains may, possibly, be removed by treatment with a solution of cyanide of potassium. Its strength is not very material. The stronger it is the quicker it does its work. Try twenty grains to the ounce of water.

MRS. CAMERON'S PHOTOGRAPHS.—J. G. WILLIAMS writes: "Reference was recently made in THE BRITISH JOURNAL OF PHOTOGRAPHY to the late Mrs. Cameron's photographs. I know an old gentleman here who has shown me two prints (about 12 x 10) by this lady, and incidentally remarked he had several more somewhere. After your remarks on the subject, I have wondered if they are of sufficient value to warrant my approaching the gentleman on the subject; also if there is any society who would take care of and exhibit such pictures, as it might be to advantage to point out that they might be loaned or given to such a body, so as to be useful to the community. If the matter is of sufficient importance, the favour of your advice would be a valuable assistance."—In reply: We thank our correspondent for his letter. The Royal Photographic Society, 66, Russell-square, W.C., might be willing to accept the photographs, which are probably of no commercial value.

** We have been obliged to hold over till next week many answers to correspondents, reviews, reports, and other matter.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

THE Fortieth Annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC is now published. The total number of pages in the 1901 ALMANAC is 1552, and the volume is the largest yet produced. The text portion of the book occupies about 500 pages. It is, as hitherto, issued in paper covers, price 1s., or cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Morgan and Kidd, of Richmond, Surrey, from a negative by Mr. W. Crooke, of Princes-street, Edinburgh. A number of other illustrations will also be found in the text matter. Over eighty articles on practical subjects, contributed by well-known photographers, form a feature of the volume. The principal advances of the year are synopsised in the "Epitome of Progress During 1900," and in the other sections, "Patented Inventions of the Year," "Miscellaneous

Information," and "Practical Notes and Suggestions of the Year," there will be found much useful matter, which, with the large collection of formulæ, tables, and other data for photographers, places at their disposal for daily reference a mass of information not to be found in any other photographic annual.

* * The 1898, 1899, and 1900 editions of the ALMANAC (20,500 copies) were each sold out within a few months of publication.

* * Of the 1901 Edition, just issued, over 18,000 were disposed of on the day of publication—an increase of more than a thousand as compared with last year.

EX CATHEDRÀ.

WE have been asked to announce that a fund is being raised on behalf of Mrs. and Miss Warnerke, who were left in straitened circumstances by the late Mr. Leon Warnerke, whose death we recently recorded in the columns of the JOURNAL. The Committee having charge of the fund consists of Sir W. de W. Abney, C.B., F.R.S., Sir H. Truemans Wood, M.A., Mr. James Cadett, Mr. Thomas R. Dallmeyer, F.R.A.S., Mr. George Davison, Mr. F. Ince, and Mr. H. W. Teed. Mr. Ince has undertaken the duties of Treasurer, and subscriptions may be addressed to him at 15, Netherhall-gardens, Hampstead, London, N.W. This movement has our heartiest support, and we hope that the Committee's appeal will meet with a liberal response. For a quarter of a century the late Mr. Warnerke was intimately associated with photographic progress in this country, and he will long be remembered for the kindly readiness with which he always placed his great store of knowledge at the disposal of those who sought it. A casual study of Leon Warnerke's photographic career must serve to show that, had he addressed himself to the task of securing material reward for his work, he might have easily provided his own opportunities for so doing. But he was quite unselfishly devoted to photography, and it is in that light that we desire to present his character to the photographic world, which is now being appealed to on behalf of those

to whom, by his premature death, he bequeathed a sorrow of no common poignancy. A list of subscriptions will be published in due course, and we ourselves shall be happy to receive and acknowledge any sums that may be sent to us. Cheques should be made payable to the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, and crossed "to account of the Warnerke Fund."

* * *

By the courtesy of Mr. J. Craig Annan, we have received a copy of the circular relating to the photographic branch of the Fine Art Section of the Glasgow International Exhibition, which will be opened in May 1901. This circular, which has been addressed to prominent photographers at home and abroad, states that "the desire of the Committee is to secure the finest and most important works of the leading pictorial workers of this and other countries, both deceased and living." The General Prospectus enters fully into the scope of the Fine Arts Section, of which photography forms a division. Mr. Craig Annan is Convener of the Sub-Committee on Photography, and among the General Committee we perceive the names of John Stuart, George Davison, James Paton, and others that will be familiar to our readers. The Arts Section will be placed in the new Art Gallery and Museum building, "which is of stone, with concrete floors, and consists of a central hall, 125 feet by 56 feet, with two courts, each 102 feet by 60 feet, east and west of this hall. The galleries are twelve in number, arranged in two floors around the courts, with eight pavilions at the corners. The galleries average 100 feet long by 28 feet wide. The upper galleries and pavilions are roof-lighted, and specially adapted for showing pictures." Photography, we understand, will be placed in one of the galleries here referred to. Mr. Craig Annan and his colleagues are working assiduously in the interests of the photographic section, which, it may be anticipated, will be the most comprehensive of its kind ever organized. It may be noted that the invitation circular asks for the loan of specifically-named photographs, but adds: "In the event of these works not being available, the Committee will be glad if you will suggest others which you could place at their disposal." This is really a wise provision, for, as the photographs are not to be delivered till March 30, there is quite time for the birth and growth of a new school of photography—so quickly are these things managed nowadays—and it would be a pity if it were not represented at Glasgow. But, seriously, we shall watch with deep interest the effect on other great exhibition executives of the notable action of the Glasgow authorities in giving pictorial photography a place in the Fine Arts Section next May.

* * *

A COPY of a distinctly fresh and novel "Christmas number" has recently reached us. It is called "New Zealand Illustrated," and it is issued from the offices of the "Weekly Press," Christchurch, N.Z. Our distant confrère shall himself describe the principal features of his annual: "The pictures total over 180, and, except about thirty, duly acknowledged to various successful New Zealand photographers, amongst which is the beautiful photograph of 'The Pīkau,' by Iles, Auckland, which adorns the cover, the negatives used have been made by Messrs. J. N. Taylor and Walter Burke, F.R.P.S., both of our staff. The whole of the process work, the printing, and the elaborate litho-

graphing of cover and supplement was done in our office and by our own staff." Beyond its sub-title of "Christmas number," there is nothing of a seasonable character about this admirably-produced publication, which, by the aid of its well-made prototypes, gives us, it would appear, a glimpse of the chief features of life in New Zealand. Dunedin, Auckland, Napier, Wanganui, and Nelson look to be delightful places, and so many, so varied, are the beauties of New Zealand pastoral life as shown in these sunny photographs that, writing as we do in the midst of December gloom, we are tempted to envy those who are privileged to live their lives where Nature is more gracious than here at home. It is a most interesting number, which we shall preserve for future reference; the blocks are well printed, and the original negatives have obviously been made by skilful photographers. In future issues we shall expect three-colour photography to be substituted for chromo-lithography in the production of the cover and presentation-plate. Meanwhile, let us say that we have been exceedingly pleased at the receipt of this very unconventional Christmas number, upon which we congratulate our Christchurch brethren.

* * *

THE "Majority" dinner of the Photographic Club, which was held last week, was a pleasant little festivity, and amongst the fifty or sixty gentlemen present there were some whose photographic experiences extended back thirty or forty years. We are betraying no secret in saying that the Club passes into the twenty-second year of its age with some misgivings as to the tenure of existence which lies immediately before it. With a past career of great usefulness to look back upon, an excellent library, meeting-room, dark room, apparatus for projection, a good sum of money invested, and some men of first-rate photographic knowledge still on its books, the Club, nevertheless, has to face a diminishing membership and dwindling interest in its meetings. The full causes of this are beyond our present purpose to inquire; we may, however, offer the friendly hint that in these days an annual subscription of one guinea is too much to expect from new-comers in photography who in suburban London can find plenty of useful photographic societies whose dues are considerably less. Mr. Bridge, the Chairman of last Saturday's dinner, made an appeal to members to help revive interest in the Club, and we hope it may be found practicable to do so, although, with the Royal Photographic Society nowadays occupying such a powerful position in the estimation of London photographers, we confess that we are not sanguine that it can be done. Still, the experiment is possibly worth attempting though it will be a task of no slight difficulty to destroy an impression, which we have found to prevail, that the Club has accomplished its mission. We sincerely hope, as we wrote some weeks ago, that the word "Finis" will not be written to the Club's record so long as photography itself exists, and nothing would please us more than to find that with the new year it entered upon a new lease of life. Twenty-one years ago, however, when the Club started, gelatine photography was a fresh and absorbing subject of experiment and discussion, and, great as photographic advance has been in the meanwhile, we fear that London photographers have no longer anything so much in common as the revolution in negative processes provided them with in the

years from 1878 to 1884 or so. And it is this fact which, perhaps, will most baulk whatever efforts are made to replace the Club in its former position of influence.

* * *

DURING the past week a considerable number of letters have appeared in the London "Standard" from victims of the "Société Artistique de Portraits, Paris." From the letters it seems that this enterprising firm of swindlers now make it a practice to send their alluring circulars to the relatives of persons whose deaths are advertised in the English newspapers, offering to send free of all charge a "beautiful crayon portrait," and, from the letters referred to, it appears that this new game has "caught on," for the writers of the letters have sent photographs of the departed with the result that they cannot get them back, unless they remit for the "beautiful crayon portrait," or the frame for it, or, failing that, the eight shillings, for the packing, &c. A professional friend, anent this subject, remarked to us a day or two ago that it served the victims right to expect that they would receive from a foreign firm a handsome picture for nothing. Why should they, especially after all the exposures of the swindle in the photographic press and the daily papers? It is almost inconceivable that English people are so easily gulled as to send "priceless portraits" to a foreign country expecting to receive enlargements from them "free of all charges." They can, of course, for a very modest sum now get them from the local photographer. "A Mother" writes, amongst the letters referred to, that she sent "a photograph of her little son, who had only just died, which photograph I would not lose for worlds." She ultimately sent, she says, five shillings, to which the Société finally reduced the charge, but had not succeeded in getting either the photograph back or the beautiful crayon portrait. Another letter, from "A Son," says: "I sent my father's photograph—the only one I had—with the usual result." Another writer says he had sent a portrait of a deceased son, also with a like result. "A Father" complains that he has sent "the only photo I had of one of my daughters," and because he refused to remit the eight shillings he has not heard any more from the swindlers. There are several other letters to the similar effect. It does seem surprising that a certain section of the British public are so easily duped by the offer of something of value for nothing; but while this is so, swindlers, however barefaced, will flourish.

SEPIA PLATINUM PRINTS AND THEIR PERMANENCY.

THE brief note in a recent issue on this subject has raised a question of considerable importance, and on which very little work has been done, practically, in fact, the only work recorded being by Hübl, of Vienna, before entering upon which it would be as well to consider the means that are employed for obtaining sepia and brown tones generally.

The most reliable method of obtaining sepia tones is undoubtedly by the use of the special sepia commercial paper, and the agent which it is said gives the sepia or brown tone is the addition of a palladium or mercury salt to the sensitising solution. On the other hand, there is not the slightest doubt that the sizing of the paper has some in-

fluence on the tone, for Hübl¹ says that animal-sized paper tends to give bluish-black tones, whilst papers sized with vegetable matters give brownish-black tones.

Another method of obtaining sepia tones is by using a mercury salt, mercuric chloride in the developer, as was done by Rowland Briant² and Strakosch.³

The third method is by the use of uranium, in the form of the well-known uranium intensifier, a process which seems to have been independently worked out by Rowland Briant⁴ and Mr. Fitz-Payne,⁵ the difference being that the former intensified his prints first with acidified gallic acid and silver nitrate, and thus obtained a red brown image, which could be further modified by the use of uranium; the latter, on the other hand, stated that black platinotype thoroughly freed from iron could be toned at once with the uranium. Strakosch used precisely the same process.

In 1895 Packham⁶ described before the Royal Photographic Society a method of toning platinotypes with a solution or decoction of catechu. Peebles Smith⁷ suggested in 1897 a process of obtaining sepia and brown prints with the ordinary black cold-bath paper by the use of a warm mixture of potassium oxalate, cupric chloride, mercuric chloride, and lead acetate, and this process will give an enormous range of colours.

As regards the permanency of the sepia prints obtained by the use of palladium and mercury in the sensitising solution, Hübl's paper⁸ is very explicit, and no apology is needed for inserting a literal translation of the same. He says:—

"By the addition of palladium or mercury salts to the sensitising solution of the iron-platinum papers, platinotypes of pure brown tones, the so-called sepia prints, may, as is well known, be obtained. The cause of the brown colour can be explained in two ways; either we must assume that a brown mercury compound or brown metallic palladium is deposited in the black platinum precipitate, or there must be, in the presence of the said metallic salts, the platinum separated in a brown-coloured modification.

"The following behaviour of the sepia prints unmistakably supports the latter assumption:

"1. A print prepared with pure palladium salt disappears completely when treated with hydrochloric acid, and, since all palladium and mercuric prints⁹ become brighter in the hydrochloric acid bath, it must be conceded that in developing any deposited palladium or mercury compounds a change in the shade of the colour cannot be noticed.

"2. Neither ammonia nor sulphuretted hydrogen alters the colour of the mercury image.

"3. Bromide vapour bleaches the brown image without altering the colour.

"4. Sepia prints, copiously treated with hydrochloric acid, cannot be toned in a uranium bath without a reducing agent, and it would appear that any observations to the opposite must be ascribed to insufficiently acid-treated pictures. If with prints thus toned with uranium the ferrocyanide of uranium be removed with ammonia, the original brown image is obtained again.

¹ "Der Platinindruck," 1895, p. 34.

² Camera Club "Journal," vol. vi. p. 175.

³ "Photo Corresp.," vol. xx. p. 169.

⁴ Loc. cit.

⁵ Camera Club "Journal," vol. vi. p. 161.

⁶ "Photo News," 1895, p. 108, Patent No. 24,963, 1894; abstract, "Brit. Journ. of Photography," 1894, p. 798.

⁷ "Amer. Amateur Phot.," 1897, March.

⁸ Eder's "Jahrbuch," 1895, p. 264.

⁹ It is obvious that here Hübl speaks of platinotype prints from paper sensitised with these salts.—Eds.

"From these phenomena it must be concluded that the sepia print, assuming that it has been sufficiently treated with hydrochloric acid, consists actually only of pure metallic platinum, which under the said conditions is separated in a brown modification. That metallic precipitates can be precipitated in various shades of colour is a well-known fact, as without palladium and mercury brownish-toned platinotypes can be prepared.

"The assumption stated is finally supported by the behaviour of platinotypes to silver intensification. Black prints intensify with silver nitrate and a reducing agent into black; sepia prints, however, into a brown colour. This peculiarity can only be explained by stating that the depositing silver settles down in a molecular structure corresponding to that of the platinum precipitate."

If these arguments can be accepted, and we see no reason against the same, one might assume that all sepia platinotypes produced by the addition of various metallic salts to the developer are equally permanent, though we are not aware of any experiments with prints produced by Peebles Smith's process, a process which is valuable in that it enables any tone to be produced, from deep blackish-brown to quite a red having been recorded.

As regards uranium toning, the general concensus of opinion and experience go to prove that the results cannot be depended upon as regards permanency, and we believe that a platinotype thus toned, which was one of the permanent collection of the Royal Photographic Society, showed after about two years considerable change of colour where exposed to the light.

As regards the catechu toning process, the only statement that we know of on this is made by Eder,¹ for he says, "The platinotypes, coloured brown by toning (uranium, catechu, &c.) contain as the lower image metallic platinum; the toning with uranium is quite stable, that with catechu, however, is not quite stable to light." It will be noted that Eder considers uranium toning permanent.

With regard to the catechu toning, a very similar and prior process is that of Liesegang, who obtained brown tones by the oxidised products of pyrogallol, amidol, &c.

Silver Salts dissolved in Silver Nitrate.—Herr Karl Hellwig has been investigating the conditions under which various complex silver salts exist in solution, some of which it may be well to place on record. At 25° C. in nitrate of silver solution, silver iodide, bromide, chloride, cyanide, and thiocyanate respectively, were soluble to the extent of 9·4, 2·13, 5·6, 9·1, and 2·6 millimolecules per litre.

Action of Chlorine on Metallic Silver in the Light.—V. von Cordier has been investigating this subject, and finds that blue and violet light favour the combination of silver and chlorine, while red light seems to be inoperative. If light before being allowed to act be made to traverse a sufficiently thick layer of chlorine, it behaves similarly to red light, but the actual result depends upon whether the gas was dry or moist. If the gas was dry, the action was partly much the same as when white light is used, but, if passed through moist chlorine, a considerable diminution in the activity of combustion is observed. If a little hydrogen be added to the chlorine the difference is still more noticeable. Röntgen rays do not influence the action of combination in the slightest degree.

Velocity of Light.—The figures generally considered the most trustworthy are those of Professor Newcomb made at Washington

in 1882. He employed Fizeau's mirror system and arrived at 299,860 miles per second as being the correct velocity. This Fizeau method involves the use of a fixed and revolving mirror, Professor Newcomb in his experiments separating them by a distance of 2550 yards in one set and of 3720 in another. It is obvious that the greater the distance apart of the two mirrors the more accurate are the figures obtained likely to be. Recently an experiment has been made increasing the distance of separation to an unprecedentedly large degree. M. Perrotin described to the Paris Academy of Sciences his arrangements, the separating space between the mirrors being no less than twelve kilometres. To ensure the utmost accuracy possible, fifteen hundred separate estimations were made and the mean of them all was but slightly different from Newcomb's, 299,900.

Examinations and Studies.—Dr. Oliver Lodge, in his address to the students of the University of Birmingham, enunciated some novel views in regard to the time examinations should be held with regard to the preceding period of study. Virtually he proposed that the examinations should not immediately follow the teaching, and that a vacation interval should intervene for private study and revision, quiet thought, assimilation, and digestion. Students should not be taken straight from the lecture room into the examination room so that they might tell the examiner what the lecturer had said before they had time to forget it. So he wished to urge that a long vacation should be left between instruction and examination; that the examinations be held in September instead of the end of June. If no interval for rumination was afforded during student days, if the unrooted ideas were pulled up for inspection by the examiner at the end of each session, the students turned loose in the holidays, empty, swept, and only partially garnished, for a period of complete idleness before another filling-in process began, the last state of that man was liable to be little better than the first. These are novel but weighty words, and deserve consideration by all examining bodies.

Corona Photographs.—At the last meeting of the British Astronomical Association much time was given to the question of the best way to photograph the sun's corona. It is naturally desired to obtain a view of the whole phenomena presented to the eye at one time; but, if sufficient exposure be given to bring out the corona, the chromosphere itself would be overdone beyond redemption; while, if the latter be snapshotted, the corona is lost. Then again, in view of the discrepancy between the results of photography and sketching by hand there would seem to be a probability that the actinic picture of the corona may greatly differ from the visual one. Professor Burckhalter some little time ago devised a method of so graduating the exposure given to each part of the image that one consistent uniform whole was produced. This method was described by Mr. Nelson at the meeting, and Mr. Crommelin praised it highly, and stated that he considered it the process of the future for obtaining a good picture of the whole corona. Mr. Thorp, whose work with diffraction gratings is so well known, made an excellent suggestion, which he considered simpler than Professor Burckhalter's—to place a vignette arrangement in front of the plate during exposure.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

[The Third Traill Taylor Memorial Lecture.]

IV.

THE negatives are made through an opaque line screen in combination with a party-coloured lens diaphragm. The opaque line screen is placed within the focal plane, and so adjusted with respect to the parti-coloured diaphragm as to make a line record of the same character as with a coloured line screen, but with the advantage that the selective colour screens can be made up of superposed films and glasses with the same precision as kromskop camera screens, and the ratio of exposures can be perfectly controlled without the use of compensating screens. This method has one disadvantage as compared with the use of the selective coloured line screen, and that is, that it

¹ "Handbuch der Photographie," vol. iv. Heft 2, p. 232, 1899.

akes longer exposures to make the negatives, and it gives slightly separated view points for the three elements, introducing colour rings on the edges of out-of-focus objects.

The most remarkable novelty is the method of synthesis without coloured line screens. For this purpose a simple optical device is employed, containing at one end three bits of coloured glass, and in the middle a pair of plano-convex lenses. Between these lenses is glass, on the surface of which has been moulded in gelatine a series of prismatic lines. Right-hand prismatic lines refract to the eye light coming through the bit of red glass, left hand prisms' light coming through the blue glass, and flat spaces between transmit light from the green glass directly. To the eye, at the other end of the instrument, this prismatic surface has exactly the appearance of a coloured line screen, but the lines can be made finer, and the colours as pure as in the kromskop.

The positive line record, when brought into register upon this surface, shows the colours with all the vividness and accuracy of the kromskop image,* and the whole outfit is simple enough to be made and sold as a superior scientific toy. I call this instrument the kromolinoskop.

Louis Ducos Du Hauron proposed to make prints on paper by the coloured line tint processes, and MacDonough and his successors have tried to carry out the idea commercially. It should be evident that if the coloured line tint is made up of pure colours, as it must be for accurate results, the "whites" of such pictures would be much nearer black than white, as compared with white paper in the same light. In practice, very weak colours are used, and the result suggests a tinted photograph with overcast whites. Those examples which I have seen cannot be compared for quality with good trichromatic prints from three half-tone process blocks, and the practical difficulties of the process are far greater.

Another and very ingenious method of positive synthesis is Professor R. W. Wood's "diffraction process." Professor Wood commences with an ordinary trichromatic positive colour record, such as a kromskop "kromogram," and prints the three images in register upon a bichromated gelatine or albumen film in diffraction-line tints, in which the lines are so spaced that the deviation for red in the print from the red positives corresponds to the deviation for green in the print from the green positive, and blue in the print from the blue positive. The resulting composite print is colourless, but, when viewed in a simple device suitably adjusted with respect to a single small source of light, diffracts to the eye a mixture of coloured lights which, theoretically, should be equivalent to the kromskop image.

By disposing the diffraction lines horizontally, which I suggested in order to readily permit of binocular vision, Professor Wood has been able to obtain stereoscopic reproductions, and the most serious defect in the picture at present is a tendency to crudity of colour, due to the fact that diffraction-line prints do not ordinarily show correct gradations of light and shade. I have proposed to overcome this difficulty by breaking up the diffraction lines by casting V-shaped shadows across the plate when making the diffraction print by means of an opaque line screen used according to my principle of graduating the lines in the half-tone process. I believe that the rendering of gradations of light and shade in the diffraction-line print can be perfectly controlled in this way. The prints can be made by placing the diffraction tints (on pellicles) in contact with the bichromated film, the kromskop positive over this, and the opaque line screen over the positive, with the direction of the lines at right angles to the diffraction lines. The opaque line screen may be so fine that the graduated breaks in the diffraction lines will not be noticeable in the result. Mr. Thorpe, of Manchester, has made diffraction prints with a single diffraction grating by disposing the lines at three different angles, and employing three sources of illumination.

The principles of trichromatic printing I have already set forth.

* One condition of perfect purity of colours in this reproduction is a "structureless" positive image. A fine ground glass laid upon the positive so mixes the coloured rays that the picture is converted into a perfect monochrome, and a very granular positive image degrades the colours by introducing a small amount of the same action. By supplementing the prismatic screen with an opaque line screen adjusted as in the camera, this defect can be remedied, but chloride of silver positives toned black should give perfect results with the prismatic screen alone.

It remains to make a few remarks about various methods of producing such prints.

The most perfect results have been obtained by printing in bichromated gelatine, either pigmented or afterwards coloured by immersion in dyes. Louis Ducos Du Hauron made prints in pigmented gelatine and superimposed them in register upon a single support. With "colour-curve" negative records and correct printing colours, very good results should be obtained in this way, provided that the printing, and development, and pigmentation of the films are all in perfect harmony—conditions extremely difficult to secure.

In 1889 I made such prints by sensitising commercial gelatinobromide celluloid films with bichromate, printing the three images as one, developing as one, dissolving out the bromide of silver, and then cutting them apart and dyeing by immersion in aqueous solutions of the dyes. This method offers the important advantage that the prints are equal in printing and development, and the colouration can be controlled. The finished prints were cemented together with Canada balsam between glasses. I communicated this method to others before publishing it myself, and it has since been credited to others, but I believe I was the only originator of it.

Lumière Brothers published a method which is an adaptation of the principle of the gum-bichromate process, and they have shown some excellent results in lantern-slide and stereoscopic transparencies but the opinion has been expressed that most of their work was not done by the method which they published, but possibly by Woodburytype printing.

Dr. Gustav Selle has adapted a principle which had previously been employed for making monochrome prints upon fabrics. He prints in thin films of bichromated gelatine, washes out the free bichromate, and colours with dyes which are fixed in the film by the chromium oxide, which has been produced by the action of light. Reimmersion in water dissolves out the colour not fixed by the chromium oxide, and leaves a positive colour print, which is sometimes very good, but it is apt to be rather too feeble for transparencies and to be tinted in the whites.

Attempts to reduce collotype trichromatic printing to successful commercial practice have wasted much time and money for a dozen printing houses since I uttered a warning and showed why the method is unsuitable. I do not know of anybody who is trying to do it now.

Trichromatic printing with half-tone process blocks was first carried out by me in 1881, and is now developing considerable commercial importance. Its development has been slow, partly because suitable paper, inks, and presses were not at first available. The almost universal adoption of the half-tone block process for typographic illustration has gradually brought about the necessary improvements in machinery, materials, and methods, so that, with correct principles to go on, improvement should now be rapid.

I now come to the consideration of some special methods and modifications, which at present appear to be more interesting than important, and must be treated briefly.

Dr. Hauron, some years ago, proposed the production of colour records in an ordinary camera by employing three transparent sensitive films superposed, one sensitive to violet light, another to green light, and another to orange light, with interleaved films of colour to control the action. The idea is a very ingenious one, and theoretically feasible; but, in practice, it will hardly be possible to make three transparent films of different colour sensitiveness which will either give the same scale of gradations in the developed images or require similar exposures. The problem of working to colour curves is also greatly complicated by this arrangement of superposed films. I am of the opinion that the production of colour records by my camera with the rhomboidal prisms will prove not only much less troublesome, but incomparably more reliable and satisfactory.

Mr. J. Wallace Bennetto has proposed a semi-dyalitic system, in which the sensitive films for the green and blue images are superposed, and the plate for the red image exposed separately, in a camera having a single transparent reflector of red glass. This system has, to a lesser degree, the defects of Du Hauron's dialytic system, but with the added defects of uneven illumination across the plates, due

to the use of a transparent mirror in a camera with a single objective, and the polarisation defect.

Charles Cros, in 1881, proposed a composite black film, made up of three or more fugitive colours, each of which would be bleached out by the action of light of the colour complementary to itself.* This is, theoretically, the most rational basis for a direct process of pigmentary colour photography that has ever been suggested, but it is doubtful if it can ever be practically developed and the colours fixed. This method has been reinvented several times, and I gave it out as a new idea myself in 1891,† together with some observations upon developing and fixing the prints. Otto Wiener has since elaborated the same idea.

In conclusion, although Maxwell's colour measurements furnished the key to a proper realisation and exposition of the principles of trichromatic photography, acknowledgment is especially due to Sir William Abney for his more complete investigations along the same lines, for many helpful observations, and for new methods of selecting and measuring colours, all of which are most valuable to the student, and should be taken at first hand. I give none of the references, because everybody who is interested in this subject should read everything which bears Sir William Abney's name as author.

Acknowledgment is also due to Mr. Thomas Bedding for his appreciation of the importance of this subject, which led him to pay close attention to it for years, and finally to publish it in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, the best editorial review of the progress of trichromatic photography which had ever appeared in photographic literature.

I am aware that the incorporation of so much controversial matter in a scientific lecture is not generally to be commended, but the circumstances are, perhaps, somewhat peculiar, and I believe its bearings upon the subject will make it helpful in this instance. I am trying to promulgate what I believe to be important truths by the most effective means which I can command, and, if I have erred in judgment or in statement, I shall be only too glad of an opportunity to make all necessary corrections.

FREDERIC E. IVES.

THE PHOTOGRAPHER'S YEAR.

DECEMBER.

Of late years there has not been much distinction between the weather of November and December, nor, consequently, as they are consecutive months in the dearest time of the year, of the appearance of things in general in one and the other. This is a change of recent years, for November, in popular estimation, is par excellence the dull and dismal month, December being regarded as brighter and altogether more cheery. Whether this continuation into so mouldy a decaying length of autumn, and the delay in the coming of winter, are merely features of a recurring cycle of weather, or whether the present order is permanent, we cannot as yet say. We would certainly wish it were the former, for crisp cold in the season we have been trained to expect it in is pleasanter than an extension of raw damp, dull skies, and fog. As something in support of the hope being justified by past records, it has been widely noted that there are cycles in weather, a succession of years of one kind being followed by a somewhat equal length of a different kind. Pharaoh's seven full and seven lean years—in which, by-the-way, Egypt would have given most telling contrasts to the photographer had he been then existent—are a well-known instance that will readily appeal to all. Herbert Spencer, our leading living philosopher, also lends incidental support to the view in his generalisations that throughout all nature there is a law of rhythm, a kind of ebb and flow, as it were. But, however interesting such a field of broad inquiry would prove, we are more concerned at present with the weather and the photographic aspect of things in December. Even if the weather of the last few years has come for good, winter has a more successful snatch at an occasional day in December than in November. There are some clear and frosty days, and he who has

held on to his camera in November is not likely to give it up now. The light in quantity is less, but other conditions, by which a fuller amount is made available, are more favourable. So much is not absorbed by fog, and, although hedge and landscape are bare, they are not so damply bare as they were, but show a crisping touch of frost. The same lighter touch of December cold brings what is more likely to generate an enthusiasm strong enough to reach working point, a light fall of snow. To most photographers snow is undoubtedly "in the abstract." They are satisfied with it in an artist's sketch, or on a Christmas card, and hesitate at meeting the discomfort of the closer acquaintance meant in getting a picture of their own. These discomforts are much reduced in the light fall, and, fortunately, the light fall is the more suitable to the purpose. In the heavy fall that comes later, there is too complete an obliteration of all the features in the landscape. Distinctive character is lost, and the picture acquires instead the characteristics of the regions of normally heavy snowfalls. An English village too completely under snow looks too much like a Russian or Norwegian village, and its representation loses point. The mind is not inclined to wrench itself free from general conclusions and impressions, strongly, though unconsciously, gained from observation and reading, in favour of the exceptional in any one picture. The more accurately a picture can represent something typical the better and stronger it is. Artists recognise this, and give a sufficiency of detail, spite of snow, to keep interest fully alive. It would not be difficult oftentimes to prove the artist's pictures of snow to be incorrect, for as he feels the cold quite as much as the photographer, and must be longer in it over his work to boot, much of it must be done from memory, and where that fails, by the aid of imagination. Still, in nine cases out of ten his picture is more pleasing than a photograph. The artist knows what he likes, and expresses it, truly inferring that other men probably like much the same thing. This all-important discriminative faculty can never be made up by a selective one, however good, on the part of the photographer; but the conditions are far more closely equalised between the two workers in representing a light than a heavy fall. A photograph under these circumstances would not only show more to advantage, but also gain strength in the hiding of the excess of detail constituting the general drawback to all photographic pictures aiming at being artistic. The plate should be a fairly rapid one, the stop large, and exposure, spite of the prevailing whiteness, moderately long. From personal experience, rapid development with pyro ammonia has proved very satisfactory, although quite as good results have been noted from a lengthier and more cautious use of pyro soda by a friend. No opinion is offered as to the merits of other developers, as they have not been tried fully enough with this type of work to justify it. Probably strong individual liking for a particular developer would, in closer knowledge of its best mode of action, so control its use as to pretty much equalise results. A slow "platino bromide" paper, fully developed, gives a good print.

A powdering of snow adds much to the value and suggestion of the Christmas pictures with which December is full. If there is no snow the photographer is, of course, out of it; but there are, fortunately, other things that strongly suggest Christmas, and it is worth some effort to incorporate them in a picture, even with the valuable touch of snow. It had better be, indeed it cannot but be, if it aspire to any height in stirring emotion, anything but an apt suggestion. Every one's mental picture of Christmas is so vague and inexpressible, made up as it is from bits that have strayed from masterly word-pictures and sympathetic descriptions, such as those of Dickens and Irving, and from scraps of remembrances of many celebrations, that nothing like a complete actual picture will meet and satisfy it. This very vagueness is really a strong help to a suggestion, and the scrappier it is the better, for more room is given to the fancy and imagination to exercise themselves in.

The celebrations and associations being mainly indoor, photographic effort is much restricted. The Christmas tree and decorations can be got, it is true, but they lack the vivifying touch of human presence and interest. Not that it is impracticable to take the Christmas tree being loaded, or the decorations being nailed up, but the exposure is too long, and if there be no movement there is certain to be a fatal woodenness in the result. The figures lack spontaneity and crispness, and the picture takes a third-rate place. The out-of-door possibilities are better; the woodman chopping down the Christmas tree, or carrying it on his shoulder in the lane; children carrying mistletoe and holly; the yule log, still an institution in many out-of-the-way corners, being hauled towards the house. Children's parties and fancy dress

* *Moniteur de la Photographie*, 1881, p. 67.

† *Anthony's Photographic Bulletin*, 1891, p. 93.

walls are also a pleasing feature of the season. It would do the little ones no great harm if taken out, even bare-headed, for a minute, to be posed against the present background in front of a camera ready occupied, and taken. The dress is the matter of an hour, and the child will only too soon grow up past its most interesting stage, but the picture remains for good to call up pleasant reminiscences.

The Christmas picture, generally, is measured more by sentiment than any severe rules of art, or the wealth published by the illustrated magazines would not find so ready and appreciative a sale. This is a concession falling in with the general unbending of stricter rules and laws at Christmas. The season is a kind of wise and necessary safety-valve for emotion that cannot well find expression at ordinary times. It is a splash of colour demanded by the better side of human nature across the prevailing greys of life. The children that we relegate to the care of others at ordinary times are now truly our own, and we recognise their particular claims by making the world as far as we can, in toys, tales, and pantomime, a child's world for their pleasure. The poor, again, are always with us in hospital, workhouse, and overcrowded slum. We recognise that we cannot be always attending to them personally, and possibly do our alternative best in arranging matters for, and subscribing towards, their well-being. But Christmas rings an instructive desire for a closer and personal touch; dinners and suppers are provided as pleasant extras, and individual effort made to make accompanying entertainments bright and successful. Whatever religious value may be attached to Christmas, if the founder who gave his name to the season had done no more than generate so keen an acceptance of the feeling of common humanity with the less fortunate, and the desire to brighten their less happy lot, he has done incomparable good to human nature and its moral evolution.

As bearing upon our point, this enlarging and softening of sympathetic feeling can be helped out by the photographer, and he himself can in doing so. Reference has already been made to the possibilities of the picturing of children in social mood. In the general social character of the season these are enlarged. There is no compliment more highly felt by any member of an assembled family than the offer to take his or her photograph. Apart from the little excusable touch of vanity that every one feels at having his picture taken, a father or mother's enjoyment must be much heightened by the evident desire of a son or daughter to gain a pleasing picture of them. The time of the year is certainly about the worst, but this must be accepted, and the gain in a willing subject at his best far more than compensates for inevitable drawbacks. The picture taken when technical difficulties were at their lowest, and skill at its highest, in the studio of the professional in June, was not regarded as particularly good. Individuality was lost in the frock coat, the pose, and the unaccustomed accessories. Although it will not be now an indoor picture, father in his top-coat ready for a walk, with a portion of his own house, lawn, or garden as background, is quite as much father as though he were seated at the fireside, and infinitely more so than in a strange studio. The gist of the argument is the value and further accentuating of those conditions making for true and broad success, as opposed to the subsidiary ones making merely for technical excellence. The former will probably be their best in every way under the benign and mellowing influence of Christmas.

In December, as in the preceding and following wintry months, there is much work that can be done to fill up dull evenings. Photographic dealers offer a bewildering variety of papers upon which printing of the highest excellence can be done by gaslight. As the print must always be the final desideratum, and negatives yield such varying results with different papers, experiment sufficient to formulate broadest results to form working rules could with advantage and interest be carried out. The "personal equation," indeed, makes this a necessity, for it is rarely that two men will agree as to the merits of a paper, even though both have closely followed the maker's directions and formulae. This makes any definite detailed statements upon the subject of little general value, did space permit of their discussion.

At the close of this series of articles that throughout the past year have gone to make up "The Photographic Year," the same reason is offered as a reason for their scrappy and discursive character. It is hoped, however, that readers sufficiently interested to have followed them, although possibly from their particular and personal points of view inclined to question the value of many of the statements made, may yet have to acknowledge having gained occasionally a fresh outlook that would not otherwise have suggested itself. If so, the writer most cordially hopes it may find practical fruition in many pleasing pictures.

BELGIUM—A RETROSPECT.

II.

I HAD many times visited this picturesque old treasure house, but hitherto had not been able to obtain permission to take any photographs of the interior. Now, however, I had succeeded in doing so, and went to avail myself of the privilege, accompanied by the friend recently alluded to. The arrangement between us was, that I was to take my pictures while he wrote his articles. Unfortunately, when he had finished his paragraphs he seemed to consider I ought to have finished my exposures, and we ought to "move on." It was an instance of theoretical versus practical photography. However, eventually, we each got "through," and were content. I have been there many times since. The position of a few of the objects has been slightly altered, otherwise it is exactly the same as it was when I photographed it; but I always seem to miss that familiar figure who on that memorable occasion, sixteen years ago, sat in out-of-the-way corners making notes.

It was on this journey I made my first series of the Ruins of Villers-la-Ville, an old Cistercian monastery founded in 1147. It came to our knowledge that "billets circulaires" were to be obtained which would take us from Antwerp to Brussels, Ottignies, and Villers, and from Bousval to Nivelles, Braine l'Allend (Waterloo), Brussels, and back to Antwerp for 3f. 30c., and we availed ourselves of these. Similar tickets are still issued, and at the same fares. The only condition is that the journey must be completed in two days, otherwise you are at liberty to stop anywhere on the route. It is a very enjoyable journey, and through some very pretty country. We had admired and photographed the abbey, walked through the wood between Villers and Bousval, and travelled from Bousval to Nivelles when a curious incident occurred which caused the stationmaster of the latter place some anxiety. We were on the platform consulting the time-tables, and, having ascertained there would be no train to Brussels for about an hour and a half, we decided to go for a stroll, but lo! and behold, all the doors leading from the platform were fastened, and the stationmaster (who appeared to be "Lord High Everything Else") had left us alone in our glory! In an old city like Nivelles there are many more interesting places than the platform of the railway station; but, how to get out? that was the question. While thinking this over we heard the sounds of a steam organ, and the usual shouting, singing, and noise which denotes a kermesse or fair. Doubtless this was where the combined station-master-porter had gone to while away the interval between the trains. We tried several of the doors without success; at last we came upon one with a piece of moulding broken off which allowed the bolt of the lock to be seen; the blade of a pocket-knife "did the rest," and in a couple of minutes we were through the waiting-room and out into the street. Having carefully closed the doors after us, we went up into the town, took some photographs of the old church and other buildings, and returned to the station just in time for the train. The expression of the official when he saw us was a study. He tried to open up a conversation on the subject of our "vanishing trick," but we simply stared at him (one of us with a stolidly blank expression, and the other with a pleasant smile), and professed perfect ignorance of either French or Flemish. We entered the train, and, looking out of the window as we departed with a polite "Bon jour, Monsieur," left him standing bewildered on the platform, evidently wondering at the eccentricity of "les Anglais."

Arrived at Brussels, another episode awaited us. At that time a Mr. Van der Perrenboom was very unpopular; whether he had been trying to "stagger humanity" in Belgium, and failed, I do not know; but there was no question about his having rubbed somebody the wrong way. Bands of students and others paraded the streets singing either the "Marsellaise" or a lugubrious chant which had been composed "pour la circonference." As we emerged from the railway station we suddenly found ourselves forming the advance guard of a revolutionary mob, and in imminent danger of being "run in." We had no alternative but to accept the situation, but at the first opportunity slipped down a side street, and found our way to the North Station by a more peaceful route. It was an exciting experience, but fortunately not of long duration.

When I visited Belgium in September 1889, I was accompanied by another light of literary photography, viz., the late J. Traill Taylor. It was his first visit to Belgium, and we made the most of the time. At Antwerp, after the churches, I think the thing that astonished our friend most was the great number of jewellers' shops in the Klapdorp,

his opinion being that the extent of the jewellery business in a city might be taken as a sort of a thermometer indicating its wealth and prosperity; hence, it need scarcely be said, Antwerp, from a commercial point of view, rose considerably in his estimation. The thing attracting the most attention there at the time of our visit was the terrible catastrophe of September 6. Everybody was talking about it, everybody was more or less suffering from it. Everywhere (especially on the north side) there were evidences of its severity, if only as revealed by the broken windows and cracked walls. Collections were being made in every part of the city in aid of the sufferers. The village of Austruweel was a wreck; not a house remained; whole families were annihilated. Portions of human bodies had been blown to the other side of the river, and sailors belonging to various ships trading to Antwerp came home to find their houses destroyed and themselves the sole survivors of a family.

The large petroleum stores of Messrs. Reith and Co. at that time were reported to have contained about 80,000 barrels. One of the large tanks (about the size and shape of an ordinary gas-holder) was battered in, and thousands of gallons of petroleum escaped and flooded the place; everything that would burn had been destroyed. Railway waggons were merely a mass of bent iron, and steel rails were twisted into the most remarkable shapes; and all this through a want of proper supervision on the part of the authorities.

It appears that a man who rented one of the warehouses in the vicinity of Austruweel bought 51 millions of cartridges from the Spanish Government solely to break up and sell for gunpowder, copper, and lead. He employed a large number of girls at a small remuneration (65 centimes per day), and they had picked to pieces more than 25 millions of cartridges when the explosion occurred. Only 700 pounds of gunpowder were supposed to be on the premises at one time. What the quantity really was on the day of the accident will never be known, but the surrounding property was simply annihilated and hundreds of lives had been lost. Everything possible was done by the Belgians to aid the sufferers and survivors of this terrible misfortune, as much as £24,000 having been collected in a few weeks.

Of course, friend Taylor and I went to visit the scene of the disaster, and obtain, if possible, some photographic record of it. This latter was not easy, for two reasons: firstly, there was little remaining to photograph; and, secondly, the soldiers on duty would not allow any one to go near the little that remained. I had taken one picture, and my companion was very anxious to get a nearer view of the ruins. "Point the camera to that soldier over there," said he, "that's where we want to get." The soldier saw us, and straightened himself up. After I had capped the lens, we saw him coming slowly towards us. We had a chat with him, and asked if he would like a print of the photograph we had taken. He was graciously pleased to favour us with his name and address. Then he asked if we would like to go over the ruins; if so, he would go with us. This he did. The ground in many places was still saturated with petroleum, the terrible ruin we beheld and the sad stories we were told, made "la catastrophe" the subject of our conversation for a long time afterwards.

The Zoological Gardens of Antwerp are among the best in Europe. The collection of animals is very comprehensive, and there is an absence of that malodorous state of things which exists in, at any rate, one other European collection I could allude to. The old railway station, which was by the side of the gardens, and on a level with them, has during the last few years been improved away. The trains now run on the high level; a magnificent glass-roofed new station now terminates at the end of the Avenue de Keyzer, and the space so many years occupied by the temporary station is being rearranged to include (among other improvements) an imposing new entrance to that happy hunting ground of the "snapshooter" and lover of good music, the Jardin Zoologique.

Mr. Traill Taylor and I had been "doing" the gardens one afternoon, when my companion made a dead stop before a shop window a few yards from the old entrée. American Cake Tobacco at 25 centimes "per stuck" was more than he could resist. We entered the establishment, and he bought enough to fill a pocket of his long overcoat. In vain I pointed out there might be some difficulty at Dover. "Sufficient for the day," &c., said he; "Sufficient for three months," said I. And he carried about his stock of tobacco with evident gratification, as the prospect of many a pipe full free of duty crossed his mind.

About halfway between Antwerp and Brussels is the little town of Malines. About ten minutes walk from the station will bring us to the Grande Place, where, within a few hundred yards, are all the

objects of interest. The Cathedral (St. Rombold), with its lofty tower and skeleton clock-face more than twice the diameter of Big Ben; the Town Hall; the Schepenen Huis; the statue to Margaret of Austria and other good subjects can all be photographed within a couple of hours. Any one liking old bits has only to find his way back to the station by the Rue de l'Empereur, and ask for the old Palace of Margaret of Austria (now the Courts of Justice). If the concierge is a good temper, and the courts are not sitting, some very good subjects may be found in the older portions of the place.

The attractions of "Petite Paris," as Brussels is so often called, have, from the photographer's point of view, been considerably added to during the last 35 years. The old parts of the city are much the same, and it is a matter for congratulation that the Guild Hous in the Grand Place (one of the finest mediæval squares in Europe) have been restored and rebuilt from time to time in the old style their predecessors. No attempt has been made to modernise or improve them, and the result is that the beautiful Hôtel de Ville and its surroundings make the square one of the chief attractions of the city.

Of the cathedral I have already spoken. The new churches in the outer portion of the ever-increasing city are not very remarkable. Some of the older ones have been restored; but Notre Dame des Victoires (dating from about 1550) has just donned a new front, and the incongruity is anything but satisfactory. The Porte de Hal still rears its head with a kind of a "don't forget me, I am the sole remnant of the old fortifications" about it. The monument to Counts Egmont and Hoorn, notwithstanding the addition of ten years ago, is as ineffective as ever. But the little Mannekin Fountain behind the Town Hall is still one of the curiosities of Brussels.

F. A. BRIDGE.

LONG FOCUSED LENSES.

[Received too late for the ALMANAC.]

"ALWAYS use the longest focussed lens possible" is a piece of advice often given, and it is wholesome advice, because it tends to counteract the inclination that so many have to use the shortest possible focused lens they can, without the appearance of dark corners on the plate with the object of getting in as much as possible of the view.

But it must not be supposed that the use of a very long focused lens is generally possible or desirable. One photographer I knew asserted that for landscape work no lens of shorter focus than 30 inches should ever be employed when using $\frac{1}{2}$ -plates, that is to say, that the maximum angle allowable was about 15° . He had a camera constructed to take such a lens, with a rigid body about 28 inches long, and a few inches of bellows at one end for focussing purposes. It was supported by two legs attached to the front and one at the back, and with it he did some most excellent work. A landscape painter, however, of whom the question was asked, "Do you in your paintings never include an angle of more than 15° or 20° ?" said: "I frequently take in much wider angles than that." And it seems reasonable that the photographer should do the same. The result of the use of such abnormally long focused lenses is that very little foreground can, as a rule, be included—the picture will consist for the most part of middle and extreme distance. A wide angled lens does include objects so close to the tripod feet that they appear too large for pictorial effect, a lane, for instance, may often be seen stretching from each side of the plate; and in photographic buildings in order to get the objects large enough the camera is brought so close that horizontal lines in planes not perpendicular to the axis of the lens converge much too strongly for pleasing effect, and the result is what is known as exaggerated perspective, though, as a matter of fact, there is no real exaggeration about it. But, on the other hand, if a very long focused lens is used, the camera must be taken so far off from the building that the lines above mentioned are so nearly parallel that the resulting picture does not give the effect of perspective relief. I have seen a picture of a church taken with a tele-photo lens from the N.W. at a distance of about half a mile, in which the west front and the north wall look as if they were in one plane; moreover, when the camera is so far from the object, the intervening atmosphere has the effect of reducing the depth of the shadows and rendering the picture flat from lack of contrast between light and shade.

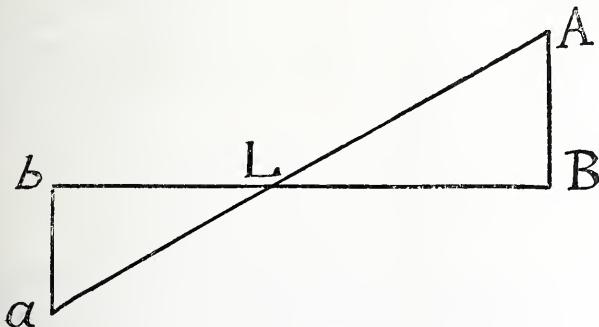
I propose to work out a few examples of the connection between size of object and image, distance of object and focal length of the lens, by means of simple geometry and arithmetic, which will show the limits that are practically put on the length of focus. To make matters as simple as possible, the lens will be treated as if it were a pinhole, so that the height of the image bears the same ratio to the focal length that the height of the object bears to its distance from the pinhole. That this is the case will be seen from the accompanying diagram.

First, for portraiture. If a 30 inch focused lens is used, and it is desired to represent a standing figure, five inches high on the plate, that is one-sixth of the focal length, then the man must stand at a distance from the camera equal to six times his own height. That is if he is six

feet in height he must stand twelve yards off. In like manner, if we wish to represent a church tower 100 feet high by an image four inches in height, then the camera must be taken to a distance equal to $7\frac{1}{2}$ times the height of the tower from it, or 750 feet, or 250 yards, more than a furlong. This would in most cases be impossible owing to intervening objects, and when possible would scarcely be desirable.

In interior work the use of a long focussed lens often gives a wrong impression. I saw a photograph of an aisle of a ruined abbey taken on a whole-plate with a 16-inch lens. The result was that only the distant parts of the aisle were included, and the effect of the long aisle—a great charm in the original—was wholly lost.

I will now assume that we are using a $\frac{1}{2}$ -plate camera for the purpose of taking vertical pictures, that it is placed five feet from the ground, that the swing back is not used, and that the rising front allows the lens to be raised so that its axis cuts the plate in a point 4 inches



from its longer side, i.e., 4 inches below the top of the picture that is taken with it. Let $A B$ be that part of the object above five feet from the ground, $a b$ its image, and L the lens. Then from similar triangles

$$L B : A B : : l b : a b,$$

but $L b$ is the focal length in inches, which we will represent by f , and $a b = 4$ inches. Hence $A B \times f = 4 L B$. Suppose ourselves inside a church the ridge of whose roof runs in a straight line from end to end at the height of 55 feet from the floor, that is 50 feet above the camera, and suppose the length of the church to be 200 feet, and that the camera be planted against the west wall.

Problem I.—What focussed lens will allow us to just get the top of the east wall on the plate? Let A be the top of this wall, $A B = 50$ feet $L B = 200$ feet, and the equation becomes $50 f = 4 \times 200$. Whence $f = 16$, or a lens of 16 in. focus will just enable us to do what we require.

Problem II.—What focussed lens must we use to include exactly half of the ridge of the roof? In this case $A B$ (which represents a vertical line dropped from the middle point of the ridge) is still 50 feet, $L D = 100$ feet, and the equation becomes $50 f = 4 \times 100$. Whence $f = 8$; or a lens of 8 in. focus must be used.

Probably in most general views we should want to include this amount of roof, and should seldom be able to get away from the east to a distance greater than four times the height, so that seldom can we use a lens of a longer focus than eight inches. In French Gothic churches the height of the roof ridge is often a third, or even more than a third, of the length of the building, so that shorter focussed lenses have to be used. In some recent work in French churches, by no means the most lofty, I found that I had to use a five inch lens in order to get a sufficient portion of the roof in to show the character of the groining.

I find it advisable not to use the swing back if it can be avoided, for this necessitates extra stopping down to secure sharpness, and this entails increase in the exposure, often sufficiently long, owing to want of light, even when the largest possible stops that can be used when the axis of the lens is horizontal are employed.

To sum up the results, I find that for interior architectural work, save for details of carving, it is rarely possible to use a lens that much exceeds in focal length the longest side of the plate, and for exterior architecture one whose focal length is about one and a quarter times the length of the longest side, for landscapes and for portraits one whose focal length is double that of the longest side of the plate is usually amply sufficient, but in all kinds of work I find it often necessary to use shorter focussed lenses than those just enumerated.

REV. T. PERKINS.

A POINT ABOUT BROMIDE PAPERS.

[Received too late for the ALMANAC.]

THERE is one point to which I have never seen reference made with regard to printing on bromide papers. There may not be much in it, but my own experience is that there is something in it. It has reference to the making of prints from negatives of varying density. We know perfectly well that in dealing with carbon paper we have the power to vary our results not only by using hotter or colder water in

developing, or by placing the printing frame nearer to or further from the window, but also by altering the strength of the bichromate in the sensitising bath. So in printing on bromide papers we can not only produce different results by varying the distance of the negative from the light or altering the constituents of the developer, but there is another way in which we can assist ourselves in getting the best results from negatives which err in one or other direction, either in too great density or the opposite extreme.

I refer to the use of different brands of paper. I have no doubt that this point has been observed by other workers. To myself it has for several years been very noticeable. If I have to deal with a negative which errs in the direction of too much weakness as regards density, I have found that I have been able to get better results by the use of Eastman's permanent bromide paper, and, conversely, that with negatives with an excess of density I get the best possible results with Wellington and Ward's tinted papers. It may be said, and with truth, that better results can be obtained from thin negatives by printing on white papers, of whatever make, but I am sure that Eastman's papers are more adapted to thin negatives than are those of Wellington and Ward's, and, conversely, that the papers of the latter firm are better suited to dense negatives than are those of Eastman's. I have no doubt that varying effects are producible by using other makes of paper, if only the worker will experiment with them. Of course, these varieties in effect can be obtained equally well by the use of a variety of developers, but when one works entirely with one form of developer, as I do, say with oxalate and iron, it is a convenience to be able to get the equality of results from such a variety of negatives, as one is sure to get in one's work, without tinkering about with half a dozen different developing formulae. H. SELBY.

THE CAMERA CLUB.

THE "Journal" of the Camera Club for December gives publicity to the following: At a general meeting of the Camera Club Company, Ltd., held on Monday, November 12, 1900, to consider the proposal of the Board to increase the subscription of members, the Chairman announced that the replies to the circulars sent to members showed that the appeal had not been answered with sufficient unanimity, and, consequently, that no resolution for the increase of subscriptions would be put to the meeting.

The replies sent in showed that 222 members were in favour of the proposed increase of subscription, and 65 against it.

He then, in conformity with the notice contained in the circulars, proposed a resolution that the Club be closed on December 31, 1900, and that proceedings be taken to wind up the Camera Club Company, Ltd. This was seconded by Mr. W. Asbury Greene, the Vice-Chairman.

Mr. E. J. Humphery proposed, as an amendment, that a Committee of Members be appointed to consult with the Board and devise a scheme for the carrying on of the Club. This amendment was carried, and, subsequently, Mr. E. J. Humphery, Mr. E. W. Pulling, Dr. D. G. Thomson, Mr. H. H. O'Farrell, Mr. R. M. Cocks, Mr. J. W. T. Cadett, and Mr. J. Wallace Godfrey were elected members of this Committee.

The Chairman tendered the resignation of the members of the existing Board, but, at the request of the meeting, these gentlemen agreed to continue in office until the end of the year.

REDHILL AND DISTRICT CAMERA CLUB EXHIBITION AND SOIREE.

THIS plucky little Club held its second Annual Exhibition in the spacious room of the Market Hall, Redhill, on Friday, Nov. 30. The Club numbers now some 75 members, and it has barely been established two years, and its weekly meetings are well attended. The President for the year is Mr. W. Brooks, of Reigate. The meeting was arranged for 7.30 p.m., and by eight o'clock a large and brilliant gathering had assembled. The first hour was occupied in the reception by the President, and what might be termed side shows, viz., tele-photography, microscopes, and some very interesting experiments with soap bubbles by Mr. W. F. Burgess, F.C.S., F.I.C., &c. This demonstration was given on the large stage. The Mayor of the borough of Reigate (Mr. F. C. Barnes) was present, wearing his badge and chain of office, accompanied by the Mayoress.

At 8.30 p.m. a concert was given, lasting about one hour. Previous to that, the President was engaged in giving explanations of tele-photography with apparatus lent him by Mr. T. R. Dallmeyer. The President had also on exhibition some of Thorp's diffraction gratings and a small direct vision spectroscope. Mr. F. Martin-Duncan had charge of the microscopes, which interested many of the visitors. In one of the microscopes was shown a micrometer 2526 lines to the inch made on Brooks's collodion emulsion by Mr. Johnson, of Manchester. There was a large display of members' work on the walls, some of

the work being exceedingly good, being a great improvement on last year. The room was badly lighted, and did not do justice to the pictures. There was good competition for the certificates, which were presented by the Mayor to the successful members, viz., Dr. Blackler, for a Surrey cottage, a very artistic production; Miss S. E. Duncan and R. Wyn Rucher, for landscapes; Mr. J. O. Grant, for animals; Mr. T. P. Padwick, for marine study "Anchored"; Miss Mabel Pelly, for "An April Evening"; Mr. A. H. Dunning, for stand camera negatives; Captain B. Marr Johnson, for enlargement of "The Silent Pool"; Mr. F. Martin Duncan, for photo-micrographs of special merit. Messrs. F. Martin Duncan, A. H. Dunning, J. O. Grant, and T. P. Padwick also scored for lantern slides. Mr. F. Martin Duncan's micro-photo slides were superb. There were several non-competitive members, viz., the President, who was represented by some two dozen exhibits, mostly printed in carbon, ranging from 12×10 up to 24×18 , and a frame of tele-photo examples taken by him in Cornwall during the past summer, fully illustrating the capabilities of Mr. Thomas R. Dallmeyer's system. Mr. and Mrs. Ralph Robinson were also well represented. Mr. Henry Speyer was represented by two exquisite examples of his Alpine work above the snow line, which are perfect masterpieces. Specially noticeable were the photo-micrographs by Mr. F. Martin Duncan, which were as near perfection as they possibly could be.

After the distribution of the awards by the Mayor, the President gave a short address in respect to the Club, pointing out its advantages to those who joined; this year the Club was in possession of a certain amount of apparatus for demonstration, and a club lantern, &c., and a library, which was growing.

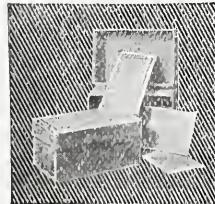
At 9.30 followed the lantern exhibition by the President, who manipulated the lantern from the gallery, some 70 feet from the screen. First were shown the members' competition slides. Mr. J. O. Grant's animal studies were greatly admired; next followed four slides by Mr. Padwick—snow scenes; following him came Mr. A. H. Dunning with four slides (general views). Mr. F. Martin Duncan's photo-micro lantern slides were the last of the competition slides shown, and were extremely fine. The above were the successful competitors, and received a certificate of merit. Then followed one dozen of Mr. Henry Speyer's Alpine slides, which are always welcome, and his name was received with a round of applause. It need not be said that his slides are of the highest possible excellence. This gentleman described his own slides. Following were a series of slides illustrating tele-photographs taken in Cornwall, which were put upon the screen. The first slide was a picture taken at one mile distant of a fishing village with the ordinary lens, without Dallmeyer's tele-photo attachment; then followed the same scene with the tele-photo attachment, which brought forth loud applause. Some similar pictures were shown of boats, &c., and St. Mawes Castle, taken at three miles distant. These were described by the President as they appeared on the screen. Most noticeable in the examples were the non-dwarfing of the distant houses and the non-dropping of the hill line—giving the whole a more natural appearance than if taken in the ordinary way, making the system most valuable to the artist. Mr. Brooks then put on the screen a small selection of his own slides made on collodio-bromide, which included some animals from the Zoo taken on one of the Club outings, some Cornish pictures, the Hotel Cecil, and Thames Embankment. To finish, a series of one dozen of Mr. Sanger Shepherd's photos in natural colours by the three-colour process (a short description of which process was given by the President). A portrait of Her Most Gracious Majesty the Queen was shown, after singing the National Anthem, bringing a most successful and brilliant evening to a close, and which the company appeared very much to enjoy.

Our Editorial Table.

THE M. Q. MIDGET DEVELOPER.

Manufactured and sold by John J. Griffin and Sons,
29-36, Sardinia-street, Lincoln's Inn-fields, W.C.

FOR the convenience of those who may have occasion to use the Velox developers in small quantities, Messrs. Griffin are now sending out



packets retailing at 2d. each, or 10d. the box of six. Each packet, of course, contains the reducer and the accelerator, and in sufficient quantity to make 2 oz. of solution. They are distinguished from the

larger M. Q. packets by the designation M. Q. "Midget" Developer, and the solution may be used for plates as well as paper. Messrs. Griffin draw our attention to the following useful note on the subject of brush development for small prints on Velox: The materials necessary are a piece of clean glass (or, as a convenient substitute, a sheet of cardboard) and a pad of cotton wool or a soft badger's-hair brush. The M. Q. Developer should be mixed up just prior to use, or, if kept at all (which is not recommended), stored in tightly-stoppered bottles filled to the neck. To develop, take sufficient for immediate needs, using a small open vessel to hold it, and apply the solution evenly and rapidly to the paper by means of the pad of wool or brush. After the development of each print, squeeze the pad or brush (or, better still, dip in clean water and squeeze dry) before recharging same with fresh developer. Under no circumstances must any portion of the used solution be returned to the vessel.

THE "SOHO" BROMIDE PRINTING MACHINE.

Manufactured and sold by Marion and Co., Soho-square, London, W.C.

As a means of making consecutive exposures on rolls of bromide paper, this little machine, as we can testify from practical trial, is a simple piece of apparatus to employ. It is very portable, for its extreme measurements are only $26 \times 13 \times 6$ inches. In use the roll of unexposed paper is placed in position at A, the end (plain paper) passed under the negative-holder, B, which is easily raised for the purpose, then between a grip, C, and finally attached to the receiving-spool, D. With a left to right movement of the lever, F, the paper is properly straightened under the negative, and, this being accomplished, F is



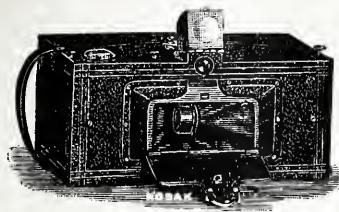
pushed to the extreme left, and all is ready for exposing. The exposures having been made, the paper must be changed, and here we quote from the succinct instructions: Grasp the lever, F, and press it to the right firmly and quickly as far as it will go, then bring it back again to its original position. What takes place by this movement is, as soon as the lever is moved, the negative-holder, B, is raised, leaving the paper free. Grip, C, moves along, pulling the paper with it, which at the same time is rolled up on the spool, D. On the return movement spool, D, does not move; the grip, C, releases the paper, and as soon as the lever has reached its first position the holder, B, comes down again into contact. The frame, E, is on springs, which keeps the whole in position. The exposure is, of course, made to an artificial light. The Soho machine is very easily worked, and it should be found of great practical value by professional photographers who have occasion to obtain a number of bromide prints identical in quality at a minimum expenditure of time and trouble.

THE NO. 4 PANORAM KODAK.

Manufactured and sold by Kodak, Ltd., 43, Clerkenwell-road, E.C.

THIS instrument is similar in construction to the No. 1 Panoram which was placed in the hands of photographers some months ago, but it gives a much larger photograph, viz., $12 \text{ in.} \times 3\frac{1}{2} \text{ in.}$. The camera takes the ordinary Bull's-eye spool, and its price is £3 10s. An excellent specimen of work done by the newest Kodak has been kindly sent us by the Company. For the information of any of our readers who may be practically unfamiliar with this system of hand-camera work we append a few descriptive particulars of the No. 4 Panoram: Its capacity is five exposures without reloading; the size of the camera, $4\frac{1}{4} \text{ in.} \times 5 \text{ in.} \times 10 \text{ in.}$; weight, 2 lbs. 10 oz.; and the length of focus of the lens, 5 in. In use: When taking the pano-

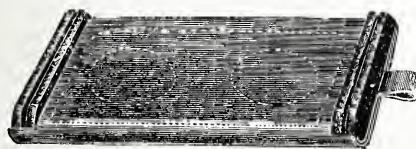
amic pictures a lever is set, and, on pressing the discharging button, he lens swings round; the film, arranged in a curve at the back of the camera, receives the impression. The view taken includes an angle of 142°. The No. 4 Panoram Kodak has a two-speed shutter, spirit



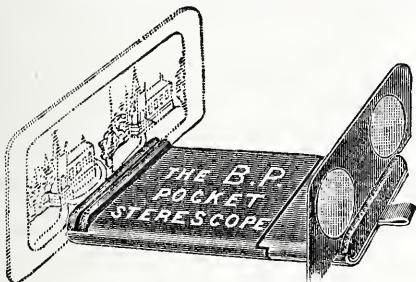
evel, a bright finder, and is fitted with socket for tripod screw. V-shaped lines on the top of the camera show the scope of the view. The camera is finished in black morocco leather, with nickel-plated fittings.

THE "BEST PORTABLE" STEREOSCOPE.

Manufactured and sold by W. Tylar, 41, High-street, Aston, Birmingham. THIS form of stereoscope which Mr. Tylar aptly calls the "B.P.,"



is portable enough when closed to be carried in the coat pocket without inconvenience, for it measures only 7½ in. × 4 in. × ½ in., and weighs



4 oz. In fact, as it is pointed out, it "looks like a cigar case, only a little longer." The illustrations show how the instrument is packed or set up. It costs only 1s. 9d., and quite answers the purpose of enabling stereo slides to be examined binocularly without inconvenience.

CATALOGUE RECEIVED.

The City Sale and Exchange, 54, Lime-street, E.C.

SEVENTY-FOUR pages of this catalogue are devoted to illustrated descriptions of optical lantern apparatus and about 200 to sets of slides. We are asked to state that a copy will be sent post free on application to any part of the world. The firm's lantern-slide library contains over 100,000 slides for hire, and a glance through the list before us shows that a very great variety of subjects is stocked.

PHOTOGRAPHISCHE BIBLIOTHEK.

No. 11, "Das Arbeiten mit Filmen," Martin Kiesling. No. 12, "Stand-Entwicklung." E. Blech. Berlin: Gustave Schmidt.)

THESE two works form part of a series of handbooks written in a popular style for the amateur upon various branches of photography. The present volumes deal with the use of films and stand development. The former subject is placed before the reader by Herr Martin Kiesling concisely and comprehensively, and should be a useful guide to those who are directing their attention to the popular substitutes for glass. Herr Blech's treatise on stand development will be read with interest by many. The method of developing negatives with very dilute baths has not received the attention it deserves. It has considerable advantages for the amateur, and we trust that Herr Blech's volume may excite further interest in the subject.

KNOWLEDGE DIARY AND SCIENTIFIC HANDBOOK FOR 1901.

528 pp. Price, 3s. London: "Knowledge" Office, 326, High Holborn, W.C.

OUR esteemed monthly contemporary commences the new century by the publication of a diary and handbook which should find a place on the desks of all those interested in astronomy and cognate scientific work. The diary space takes up about 400 pages, and the general contents include a calendar of notable scientific events, twelve star maps, showing the night sky for every month in the year, a monthly astronomical ephemeris, an account of the hundred brightest stars and of the astronomical phenomena for the year, with various astronomical

notes and valuable tables; an original essay on the uses of knowledge; many original articles, including one on "How to use an Equatorial Telescope," &c.; an historic summary of the advance of science in the nineteenth century, and other items. In reading the various ably-written summaries in the book we are struck by the immensity of assistance which photography has rendered to astronomical science in recent years. This diary and handbook is really a well-conceived idea ably carried out, and we welcome it as a distinct gain to the list of useful annual publications.

News and Notes.

ROYAL Photographic Society.—Technical Meeting, Tuesday, December 18, at 66, Russell-square, at 8 p.m., "Photography in War," by H. C. Shelley, the War Correspondent.

JUVENILE Lectures at the Society of Arts.—The usual short course of lectures adapted for a juvenile audience will be given at the Society of Arts on Wednesday afternoons, January 2 and 9, 1901, at 4.30 o'clock, by E. Walter Maunder, F.R.A.S., Superintendent of the Solar Department, Greenwich Observatory, on "Eclipses."

A CORRECTION.—Mr. J. A. Reid writes: In the matter entitled "Photographers, the Public, and the Illustrated Press," published in your issue of November 23, the following sentence occurs: "In the case of photographs of Royalty and of distinguished personages, however, the supply is much less limited." The word "less" should obviously have been "more."

THE Royal Society will begin a work of great magnitude and importance on the first day of the new century—no less than an International Catalogue of Scientific Literature. It is to be issued in seventeen volumes, relating to seventeen different sciences. The Government have given a guarantee of £1000 a year for five years, "to make good to the Royal Society a part of any loss which may be incurred by the publication of the proposed catalogue." It is hoped, however, that it will not be necessary to ask for the sum guaranteed, or, at most, for more than a small part of it.

THE Croydon Camera Club's Fourth Exhibition will be held at the Art Gallery, Park-lane, Croydon, from Wednesday, February 20, to Wednesday, February 27, 1901. The following are the open classes—Landscape and Marine; Figure Studies and Portraiture; Architecture (exterior and interior); Any subject (open to amateur photographers resident in the borough of Croydon); Lantern slides (sets of six slides). One silver and one bronze medal will be offered in each of the open classes. Entry forms and further particulars can be obtained from the Hon. Secretary, Mr. W. H. Rogers, 46, Bensham Manor-road, Thornton Heath.

THE Amateur Photographic Field Club.—The Camera Club "Journal" states that the Annual Exhibition of lantern slides, by members of the Amateur Photographic Field Club, took place at the Camera Club on November 7. In the unavoidable absence of the President, Mr. Alfred Deed, the chair was taken by Lieut.-Colonel Gale. Slides were exhibited by Lieut.-Colonel Gale, Major Lang, and Messrs. Seymour Conway, T. Bright, W. G. Harrison, B. E. Lawrence, H. H. P. Powles, Reginald Belfield, and A. C. Beard. The hundred and forty slides exhibited were fully up to the reputation of the oldest photographic club in existence, and showed that the Field Club is as vigorous as ever.

UNIVERSITIES and Polytechnics.—The relation of the polytechnics and technical institutes to the newly-constituted University of London was the subject of an address delivered last week by Sir Michael Foster K.C.B., M.P., at the Northern Polytechnic Institute. In the struggle for existence between man and man and race and race, he said, the knowledge called "useful" was becoming more and more an important factor. Therefore, polytechnics were regarded with the greater favour by universities for the reason that in their handling of useful knowledge depended the prosperity of industry and commerce of this great country; they could, in fact, help England to win back that trade which she had lost!

WE are informed that, after a lapse of a number of years, the Sheffield Photographic Society is proposing to have a public Photographic Exhibition. At a recent meeting of the Society a suggestion to that effect was brought forward by the Council, who were requested to give further consideration to the matter, and bring forward a definite scheme for a suggested Exhibition. At a subsequent meeting of the Council the whole matter was, with the assistance of Mr. Ezra Clough, Secretary of the Yorkshire Photographic Union, fully discussed, and certain suggestions adopted, which were placed before the monthly meeting of the Society. When, after considerable discussion, it was resolved that an Exhibition be held next year, and a guarantee fund formed in connection therewith.

MORE Disappearing City.—Soon there will be very little of the old City of London left. All the ancient buildings are fast being demolished for improvements that become imperative by modern requirements. It has now been decided to pull down the four old houses and shops now standing before the Church of St. Giles, Cripplegate, to widen Fore-street. With the shops, the old gatehouse will be removed. This quaint-looking edifice dates back to 1660. This ancient gate, we learn, will be carefully taken down and re-erected some distance further back, but the old houses, with their antiquated frontages, are to disappear for ever. Although the old gateway will be photographable in its new quarters, the pictures taken under the modern conditions will not have

the same interest in the eyes of archaeologists as will those taken in conjunction with its ancient surroundings. It is for that reason that we call attention to the subject, so that those of our readers who desire to secure photographs of the block while it is intact may obtain them before the opportunity is lost. The City authorities are slow to move, but when once they start they proceed quickly.

ROYAL INSTITUTION.—The following are the Lecture Arrangements at the Royal Institution, before Easter:—Sir Robert Ball, six lectures (adapted to young people) on Great Chapters from the Book of Nature; Professor J. A. Ewing, six lectures on Practical Mechanics (experimentally treated), first principles and modern illustrations; Dr. Allan Macfadyen, Fullerian Professor of Physiology, R.I., four lectures on The Cell as the Unit of Life; Dr. Arthur Willey, three lectures on The Origin of Vertebrate Animals; the Rev. H. G. Graham, three lectures on Society in France before the Revolution; Sir Wyke Bayliss, two lectures on Shakespeare in Relation to his Contemporaries in Art; Professor R. K. Douglas, two lectures on China; Mr. F. Corder, three lectures on Vocal Music, its Growth and Decay (with musical illustrations); the Right Hon. Lord Rayleigh, six lectures on Sound and Vibrations. The Friday Evening Meetings will begin on January 18, when a discourse will be delivered by Professor Dewar on Gases at the Beginning and End of the Century; succeeding discourses will probably be given by Dr. A. W. Ward (the Master of Peterhouse), the Right Rev. Monsignor Gerald Molloy, Professor G. H. Bryan, Professor J. J. Thomson, Sir W. Roberts-Austen, Mr. H. Hardinge Cunynghame, Mr. W. A. Shenstone, Dr. Horace Brown, the Right Hon. Lord Rayleigh, and other gentlemen.

A NEW PHOTOGRAPHIC CLUB FOR GREAT YARMOUTH.—One of our Yarmouth contemporaries gives the following particulars of the formation of a new photographic club at Great Yarmouth. For some time past the town has been unable to boast, amongst its heavy list of clubs and societies, an organization devoted to the interests of local followers of the entrancing science of photography (unless we make an exception of one or two somewhat nebulous and moribund societies) which, seeing how strong are the ranks of amateur photographers in this locality, is undoubtedly a reproach. This has evidently occurred to several enthusiasts, prominent among whom is Mr. T. J. Wigg, a gentleman already engaged in so many useful and diverse enterprises that it was only natural that on his shoulders should fall the burden of the preliminary arrangements in the formation of a new club. In his busy, but never too busy, hands, matters proceeded smoothly and expeditiously to the desired consummation, and recently the Great Yarmouth and District Camera Club was duly constituted, Mr. Bruce Leach presiding over a full and representative meeting of the riders of this pleasant and instructive hobby. The following officers were elected after the necessary preliminaries were gone through:—President, Fleet-surgeon S. T. O'Grady, R.N.; Vice-Presidents, Messrs. B. Leach and G. Rumbold; Hon. Secretary and Treasurer, Mr. T. J. Wigg; Committee, Messrs. C. Rumbold, W. Wigg, — Simpson, H. E. Ebbage, C. W. Moss, and the Rev. D. Harford-Battersby. Mr. Wigg, the Hon. Secretary, whose address is Holland House, North-quay, will be glad to hear from those desirous of joining the club.

Commercial & Legal Intelligence.

THE Taber Bas-Relief Photographic Company, 141, New Bond-street, W., have been awarded a silver medal for their exhibit at the Jubilee Exhibition which has just been held at Frankfort-on-Maine.

WALTER D. WELFORD v. WALTER GRUBB (TRADING AS THE CAMERA CONSTRUCTION CO.).—In a previous issue we referred to this County Court case, in which Mr. Welford claimed damages for delay in executing orders, a counter claim being entered for loss of profit on an unfulfilled contract. On Friday last the Judge gave his decision, awarding Mr. Welford £5 damages, the counter claim being dismissed with costs.

MESSRS. NEWTON AND CO., of 3, Fleet-street, E.C., ask us to state that they are now making lantern slides from Mr. Douglas English's negatives of British reptiles, such as snakes, frogs, toads, lizards, &c., showing their various stages of evolution. Dr. Spitta has just completed a set of negatives of malarial diseases, a subject that is of much interest just now. More slides will be ready directly. We also understand that Messrs. Newton's Ether Saturator is also attracting very great attention.

THE London, Brighton, and South Coast Railway Company are issuing an illustrated handbook to "The Riviera for a £10 note." A series of inexpensive Riviera tours are given via Newhaven and Dieppe. By a ticket costing £10 first-class, and £7 7s. second-class, it is now possible to visit the whole Riviera coast, including Marseilles, Cannes, Nice, Monte Carlo, San Remo, &c. The journey can be broken at Paris in both directions, thus saving the fatigue of the long through journey between London and the Mediterranean.

DISSOLUTION OF PARTNERSHIP.—The co-partnery hitherto existing between Andrew George Adamson and Graham Cochrane Kirkwood MacLennan, carrying on business at 22, Christopher-street, Finsbury-square, London, E.C., as Adamson Bros., Electrical Engineers and Experts in Artificial Lights for Photography, has been, by mutual consent, dissolved as from the 5th ult. All debts due by and to the firm at that date will be paid and received by Andrew George Adamson, who will continue the business as before, at the same address, for his own behoof.

THE TELLA EASY-PAYMENT SYSTEM.—For the convenience of their clients and others, the Tella Camera Co., Ltd., of 110, Shaftesbury-avenue, London, W., are adopting the easy-payment system, applicable to any make of photographic apparatus. The following are among the principal conditions:—The payments for goods are extended over six months for purchasers under £6, over nine months for purchasers over £6 and under £9, and over twelve months for purchasers over £12. A deposit of not less than a sixth part of the value of the goods ordered must accompany each order, which will be considered to be the first monthly payment. Goods may be selected from any maker's list approved of by the company. A pamphlet giving full particulars of the system may be obtained on application to the company at the above address.

RE GEORGE THATCHER AND ELEANOR LOUISA SOMERSET, trading as E. Hawkins and Co., Artist Photographers, Preston-street, Brighton.—The public examination of these debtors came on for hearing at the Brighton County Court, before the Registrar, on Thursday, Dec. 6. The debtor Thatcher stated that the statement of affairs disclosed liabilities amounting to £384 8s. 9d., and assets estimated to produce £323 13s. 9d. The business was formerly carried on by a Mr. Hawkins, who died in 1889. Witness then acted as manager, and subsequently he put £600 into the business, and took it over. In 1892 he got into financial difficulties, but he could not remember what dividend in the pound was paid to the creditors. In 1898 he again became involved in difficulties, and paid his creditors 10s. in the pound. Some of the money to pay that dividend was provided by Miss Somerset. Some of the debts due under that arrangement were still outstanding. In 1899 he took Miss Somerset into partnership, but the business was not profitable.—Miss Somerset stated that she kept the books of the firm. The business would have paid its way but for the old debts.—The examination was closed.

THE TRADE POISONS BILL.—A third and final meeting of the Chemical Trade Section of the London Chamber of Commerce was held on Tuesday afternoon last week to consider the above Bill (which has been formulated by the Traders in Poisons and Poisonous Compounds for Technical and Trade Purposes Protection Society of 5, Clement's-inn, London, W.C.), which has for its object the alteration and amendment of the law relating to the sale of poisons and poisonous compounds for agricultural and other trade purposes in Great Britain and Ireland, and to decide what action, if any, should be taken by the Chemical Trade Section in the matter. There was a very full attendance of members and others interested, and after considerable discussion the following resolution was proposed by Mr. Thomas Bennett (Messrs. Bennett, Lawes, and Co., Ltd.), and seconded by Mr. J. J. Bowley (Messrs. F. Bowley and Sons):—"The Chemical Trade Section recommend the Council of the Chamber of Commerce to actively support in Parliament the proposed Bill to alter and amend the law relating to the sale of poisons and poisonous compounds used for agricultural and other trade purposes."—The resolution was carried.

THE ALLIANCE BETWEEN SCIENCE AND INDUSTRY.—Last September Prof. Carhardt communicated to the American Institute of Electrical Engineers a very complete account, which has recently been printed in "Science," of the Reichsanstalt at Berlin. He had worked there as a guest for some months in 1899, and had thus gained an insight into its management and organisation. The details he gives of these are very interesting, and the proof of the value of the work done, and of its consequences to German industry, most striking. The cost of the Institution, we may note, was about £200,000; the annual expenditure amounts to about £15,000. After mentioning these figures, he continues: "A very pertinent inquiry is, what are the results of all this expenditure?" and a careful analysis leads him to the conclusion that "the results have already justified, in a remarkable manner, all the expenditure of labour and money. The renown in exact scientific measurements formerly possessed by France and England has now largely been transferred to Germany. Formerly scientific workers in the United States looked to England for exact standards, especially in the department of electricity, now they go to Germany." And, again, "Germany is rapidly moving toward industrial supremacy in Europe. One of the most potent factors in this notable advance is the perfected alliance between science and commerce existing in Germany. Science has come to be regarded there as a commercial factor. If England is losing her supremacy in manufactures and in commerce, as many claim, it is because of English conservatism and the failure to utilise to the fullest extent the lessons taught by science."—"Nature."

Patent News.

THE following applications for Patents were made between November 26 and December 1, 1900:—

CINEMATOGRAPHS.—No. 21,339. "Improvements in Apparatus for Photographing and Exhibiting Cinematograph and Mutoscope Ordinary Pictures." H. W. H. PALMER.

APPARATUS.—No. 21,537. "Improvements in or relating to Photographic Apparatus." A. SALMON.

CINEMATOGRAPHS.—No. 21,545. "Improvements relating to Cinematographs." L. GAUMONT.

SHUTTERS.—No. 21,594. "Improvements in Denoting Speeds of Photographic Shutters." A. L. ADAMS.

DEVELOPING DISH.—No. 21,711. "An Improved Photographic Developing Dish." E. B. FOX.

PHOTOGRAPHING IN COLOUR.—No. 21,817. "A Process for Photographing in Colour." B. ACRES.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
Doncaster	{ Some Typical Subjects and their Treatment. A. Horsley Hinton.
Glasgow and West of Scotland	Demonstration: <i>Velox</i> Novelties. Makers' Demonstrator.
Aintree	The Norman Castles of Wales. E. E. Thorpe.
Birmingham Photo. Society	Social Evening and Exhibition of Members' Christmas Cards.
Bootle	Annual General Meeting.
Croydon Microscopical	Ordinary Meeting.
Gospel Oak	{ Demonstration: <i>Lantern Slides by the Carbon Process</i> . H. H. Morgan.
Newcastle-on-Tyne	{ Films v. Plates, and the New Thornton Film. W. D. Welford, F.R.P.S.
Royal Photographic Soc. ety	Photography in Warfare. H. C. Shelley.
Borough Polytechnic	Lantern Night.
Croydon Camera Club	Portrait Practice with Oxymagnesium Lamp.
Photographic Club	{ Photography in Natural Colours, by the Macdonough-Joly Process. H. Snowden Ward.
Woodford	Informal Meeting: Combined versus Separate Toning of P.O.P.
Darwen	{ Development with <i>Ortol</i> versus Other Developers.— <i>Ortol</i> , J. W. Smith; Other Developers, A. Almond; Plates to be Exposed, John Wild.
Hull	Photography and its Difficulties. J. Pybus.
Leigh	{ Hand-camera Work from Start to Finish. A. Horsley Hinton.
Liverpool Amateur	Demonstration: The Manipulation and Development of the Roller Film. The Kodak Company.
London and Provincial	Open Night.
Oldham	Annual Dinner.
Aberdeen	Lantern-slide Selection. J. Main.
Bognor	Monthly Competition: Portraiture.
Croydon Microscopical	Conversational Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 11.—Ordinary Meeting.—Mr. T. R. Dallmeyer, F.R.A.S. (President), in the chair.

NEW MEMBERS, AUDITORS, &c.

A large number of new members (about 25) were elected, and nine candidates for membership were nominated.

Messrs. H. Vivian Hyde, Frank Seary, and W. E. Dunmore were elected as Auditors of the Society's accounts for the current year.

It was announced that the Blairgowrie and District Photographic Society had been admitted to affiliation.

The President acknowledged the receipt of several gifts to the Society, among them being a Daguerreotype stereoscopic slide, presented by Mr. Duncan Robertson, which had been given by the late Mr. Walter Woodbury to Mr. Louis Woolf. It was in a wonderfully good state of preservation.

AN ISOCHROMATIC-SCREEN ATTACHMENT.

Major-General Waterhouse, I.S.C., on behalf of General Tennant, showed a Thornton-Pickard shutter to which had been fitted a very simple and effective attachment for an isochromatic screen. The attachment consisted of two rectangular slips of ebonite so arranged as to form a groove in which a glass light-filter could be placed without interfering with the ordinary use of the shutter.

A NEW ARTIFICIAL LIGHT.

Mr. Chapman, of the Atmospheric Gas Company, gave a demonstration of a new system of artificial lighting, and exhibited prints from negatives taken by this illuminant. The negatives were on Barnet medium plates, and the exposure was five seconds with a portrait lens (aperture not stated), three burners being employed. The prints were on P.O.P. and had been printed out in half-an-hour at a distance of ten inches from one of the gas-burners, the light from which was said to be 125 candle-power, as shown by a photometer. The burners were fitted with ordinary Welsbach mantles, and the only necessary apparatus was a carburettor and some means of producing half an inch of air pressure, the gas being derived from a mixture of 75 parts of the crudest benzoline with 25 parts of the purest paraffin. An analysis of the gas as burned showed that it consisted of oxygen 24.46, nitrogen 77.68, and only 1.86 of combustible gas. There was no smell or smoke; and, to show that there was no danger, even if the taps were left open in the presence of naked lights. Mr. Chapman played with the apparatus in a manner which one would have expected to result in the rapid and complete demolition of No. 66, Russell-square, and the dispersal of the audience in a multitude of small and undistinguishable fragments. But nothing happened.

THE MACDONOUGH-JOLY COLOUR PROCESS.

Mr. H. Snowden Ward read a paper on "The Macdonough-Joly Process of Colour Photography," and showed a large collection of lantern slides to demonstrate the capabilities of the method. He disclaimed any commercial interest in the subject, and regretted that it had no commercial aspect at present, as there was, consequently, no immediate prospect of

members being able to purchase the necessary apparatus and materials with which to pursue their own investigations. He added that he was informed on the best authority that the public would not be asked to subscribe to any scheme or company for exploiting the Macdonough-Joly process. As the archives of the Society contained very little information upon the subject, he proceeded to give some details of the work which had been undertaken with a view to devising a natural colour process for the production by means of one negative and one print, and without complicated labour on the part of the photographer, of either transparencies or photographic or photo-mechanical prints. The first man to suggest a practical method of achieving this result was Louis Ducos du Hauroon, but, owing to the want of plates sufficiently sensitive to red and green, his ideas were not practicable. Mr. James Macdonough, who in 1892 applied for a patent in the United States, claimed the invention of a method in which specks of coloured transparent matter were scattered under or over the film of a gelatine dry plate, but its practical difficulties were apparently sufficient to cause him to abandon it in favour of the scheme suggested long before by Du Hauroon, and which had occurred almost simultaneously to Dr. Joly, of Dublin. The same idea appears to have been independently evolved by both Dr. Joly and Mr. Macdonough, and without knowledge of the work of Du Hauroon, and also by a Mr. Anderson, who carried it a stage further. The outlines of the Macdonough-Joly process, as it now exists, are tolerably well known, and Mr. Snowden Ward's paper comprised a consideration of the problems which it involves—the mechanical, chemical, and optical difficulties in connection with the ruling of the taking and viewing screens, the selection of colours and plates, and of dyes having the correct absorption, the production of paper prints, &c. The slides exhibited—some of which were very fine—included examples from negatives taken in London by the author of the paper, and others by the Ohio Colour-Photo Company, Mr. Gayton A. Douglass, Professor Peterson, Mr. C. N. Crewdson and Mr. S. L. Stein (of Milwaukee). The apparatus used by Mr. Snowden Ward, and the special plates required, had been lent to him by Mr. D. K. Tripp, of Chicago.

A very brief discussion ensued.

COMING EVENTS.

"Photography in Warfare" will be the title of a paper to be read, at the Technical Meeting on December 18, by Mr. H. C. Shelley (war correspondent of "The King"), who will exhibit slides from negatives taken by himself during the campaign in South Africa. There will be no meeting on January 1.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 6.—Mr. R. P. Drage in the chair.

Mr. W. D. Welford showed a gas-stove useful for carbon printing, and to which allusion was made by Mr. Watmough Webster in a recent article in these pages. Its construction fits it very well for suspension on the wall-bracket system, and this is how the speaker made use of it. A piece of zinc preventing damage to the wall by heat. Cold water is introduced by a rubber pipe from the supply tap connected with the stove, the gas is lit, and boiling water comes out at the rate of a quart a minute. The water passes along two tubes fitted outside with a number of heat-radiating metal discs. The stove is made by Fletcher of Warrington, at a moderate figure.

Mr. T. E. Freshwater showed on the screen the result of a further experiment with the Joly process. The subject was a dish of apples, but the reds were a little too prominent in the slide. The difficulty he had previously referred to of getting the lines of the positive to correspond exactly with those of the viewing screen, still troubled him, and he thought that there must be some variation in the widths of the ruling of the taking and viewing screens he used. In addition to a number of miscellaneous old slides, he showed a series, from negatives by a friend, depicting life and customs in the neighbourhood of Darjeeling and Kurseong, in India. Tea-planting is the principal following in these parts, and many were the views showing the fields covered with the tea-plant, the natives picking the leaves, the drying and fermenting of these in the houses, and finally, the cases of finished tea ready for despatch to the retailer and consumer. Landslips have caused much damage in these regions, and abundant testimony to the extent of the devastation was given in some of the photographs of hillsides denuded altogether of what was a fine crop of the plant. Other photographs presented the curious effect of railway lines and sleepers suspended in mid-air, the heavy rains having washed away the supporting earth in their torrential descent from the mountains. From Darjeeling, fine views of the Himalayas are to be had, and one of the slides depicted the lofty Mount Everest at a distance of very many miles. The series was completed with a selection of photo-micrographs of parasites peculiar to Indian creatures—flying foxes, fireflies, &c. The photographs and the descriptive notes given by Mr. Freshwater were received with considerable pleasure and attention.

PHOTOGRAPHIC CLUB.

DECEMBER 5.—Mr. H. Snowden Ward in the chair.

Mr. Geo. E. Brown said he had been dealing lately with two or three gross of plates, and had put to the test Mr. J. R. Williams's assertion that spirit baths used to accelerate the drying of plates could be kept active in an easy way by the immersion of some dry gelatine in the bath. The effect of this was said to be that the water abstracted from the gelatine plates by the spirit was taken up from the spirit by the dry gelatine at the bottom of the bath, thus maintaining the spirit bath for a longer time in a condition of efficiency. The speaker found

that a bath so furnished with a dry gelatine absorbent acted just about as well as the spirit bath usually did, but was not appreciably better, and the bath worked slowly in course of time owing to the excess of water taken up by the spirit. On the face of it, he thought that it was incredible that the spirit should remove water from one mass of gelatine to give it up to another, unless a difference in the nature of the two gelatines was sufficient to bring the result about.

Mr. A. Mackie did not attach much value to the suggestion, saying that a piece of dry gelatine placed in the spirit bath came out as dry as when it went in.

Mr. E. W. Foxlee said that over and over again during the past thirty years these instructions had been published. He had taken some Nelson's fine photographic gelatine, and thoroughly dried and digested it in 350 spirit for a week, taking the specific gravity of the bath before the addition of the gelatine and at the end of the week. He found that the spirit was of exactly the same strength as when he began. If the spirit contained a great deal of water, and dry gelatine were introduced into it, time might show that water was absorbed, he thought, but with spirit of any pretence to strength he thought not.

A discussion took place regarding the best developer for bromide enlargements, having in view considerations of permanence and colour of the image.

Mr. F. A. Bridge said that ferrous oxalate was his preference. The nature of the developer had no influence upon the permanence of the print. Ferrous oxalate gave as many variations of black as any developer. For these reasons, in his opinion, ferrous oxalate was an excellent developer.

Mr. E. W. Foxlee held that, theoretically, ferrous oxalate was not a good developer. It was usually acid, and the print, after development, was treated with acid, but he was sure that this acid was seldom washed out before fixing, thus risking the liberation of sulphur with the decomposition of the hyposulphite.

Mr. Bridge could show prints made years ago which never received more than five minutes' washing. So long as they were thoroughly fixed there was thus, apparently, little to fear.

Croydon Camera Club.—One of the great nuisances which beset the go-as-you-please photographer is without doubt the trouble and uncertainty which accompany the toning of silver prints. Two courses are open. One is the sweet simplicity of the "combined" bath, in which a delightful tone is quickly and easily obtained, but sub-sulphides, lurking in the image are apt, in a very few days or weeks, to bring about all kinds of extraordinary changes, which serve to ruin, if not destroy, the print. The other alternative is the sulphocyanide—or other gold toning bath. This is not only wasteful, but is tedious, uncertain in action, and unreliable in the tone which ensues. No wonder, then, that there was a goodly gathering at the club rooms on Wednesday, December 5, when Mr. E. G. Ley introduced, for the first time in England, a new make of print-out paper which requires no gold toning. We need not enter into details of manufacture except to indicate that the paper holds in its gelatine surface the silver salt which forms the visible image, and also the gold salt which tones the image. When printing is complete—the time taken being about the normal—about two minutes' immersion in ordinary salt and water causes the print to assume the customary photographic purple-brown hue. A subsequent hypo bath, to dissolve out the unacted-upon silver, followed by the usual washing, completes the operation. Mr. Ley showed the simplicity and certainty of the process by manipulating a number of prints.

Southsea Amateur Photographic Society.—The most popular and effective means of encouraging the development of photography and of raising the standard of work throughout the country is the holding of exhibitions with classes open to all competitors, and Southsea is not behindhand in taking her share in the responsibility. The arrangements for the Annual Exhibition, which the Southsea Society is to hold on January 29, 30, and 31, 1901, are rapidly progressing, and now the committee have secured the services as judges of such experts as Messrs. H. Snowden Ward, H. Simonds, and W. West, this now well-known Exhibition must certainly repeat the success that has attended those held in preceding years. All information can be obtained from the Hon. Secretary, Mr. Gilbert Wood, 10, Pelham-road, Southsea.

Leicester and Leicestershire Photographic Society.—The Annual Exhibition of this Society will be held in the Co-operative Hall, Leicester, on March 19 to 22, 1901. There will be open and local classes, silver and bronze medals being offered in each, also a championship medal for the best picture in the Exhibition. There will be a large number of other attractions, comprising lantern displays and specimens of early work in photography, &c. The names of the judges will be announced later. Entries close March 13. Pictures must be delivered not later than March 15. Entry forms and full particulars may be had from the Exhibition Secretaries: H. Walker, Glen Burn, Ashleigh-road, Leicester, and E. W. Bush, 19 Equity-road, Leicester.

FORTHCOMING EXHIBITIONS.

1901.

January 14-19 Blairgowrie and District Photographic Association.

The Hon. Secretaries, Blairgowrie, N.B.

February 16-March 9 Edinburgh Photographic Society. Secretary, J. S.

M'Culloch, W.S., 10A, George-street, Edinburgh.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE BLAIRGOWRIE EXHIBITION.

To the Editors.

GENTLEMEN,—I will be obliged if you will kindly notify your readers that entries for the Blairgowrie and District Photographic Association's Third International Exhibition close on the 20th inst.

Particulars and entry forms will be gladly sent on application to yours truly,

JOHN B. MACLACHLAN, Joint Secretary.

Blairgowrie, December 6.

THE LATE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the Editors.

GENTLEMEN,—That the Photographers' Benevolent Association is dead there is no shadow of doubt; but I don't think it is yet time to give up all hope of its resuscitation.

I have been waiting an opportunity of making one more effort in that direction, and, with your permission, would ask all photographers (employers and assistants) who are earnest in their desire to have some such a society attached to the profession to write me at the address below; then, if the response is in any way encouraging, a preliminary meeting will be called on an early date.—I am, yours, &c.,

W. T. WILKINSON

(Original Founder of the Photographers' Benevolent Association).
63, St. John's-hill, S.W., December 3.

[We do not wish to discourage Mr. Wilkinson in his well-meant desire to revive the Benevolent Association, but in our opinion the calling and holding of such a meeting as he proposes can serve no useful purpose. If a good number of the principal professional photographers, and their assistants, in London, were to join forces and arrange for a *personal canvas* of their brethren in all the large towns, something might be done towards arriving at a practicable scheme; but not otherwise, we are afraid. The initiative must come from those more directly interested in the scheme; and, failing that, in our opinion it will be sheer waste of time on the part of Mr. Wilkinson or anybody else to attempt to make photographers self-helpful against their wills or inclinations. Eds.]

THE THORNTON FILM COMPANY'S COMPETITIONS.

To the Editors.

GENTLEMEN,—We have pleasure in announcing that we have commenced a Monthly Prize Competition for the best negatives taken on the Thornton Film. The prize given is a folding pocket Kodak, and the results will be announced every month.

Competitors may enter as often as they like, and are not restricted as to the number of negatives. All negatives remain the property of competitors, but we are willing to purchase them by arrangement afterwards.

Entry forms and full particulars will be found in each packet of films. We are, yours, &c.,

THE THORNTON FILM CO., LTD.

Altrincham, December 4.

The following are the full particulars and conditions of the competition:

The prize consists of a Folding Pocket Kodak, value £2 2s. Suitable for lady or gentleman.

The prize is given every month in the year for the best negative sent in during the preceding month.

CONDITIONS.

1. Competitors may enter as often as they like. No competitor is disqualified if he or she happen to have secured a prize before.

2. Negatives may be any size and any subject. Several negatives may be entered by one competitor, if desired.

3. All negatives entered must have been developed during the preceding month, or, in the case of competitors abroad, during one of the two preceding months.

4. Negatives must be on Thornton Film (any of the different kinds quoted in the price list).

5. The negatives, together with a print from each, and accompanied by the entry form, duly filled in and signed, must be sent by post direct to the Thornton Film Company, Ltd., Altrincham, Cheshire, not later than the 3rd of the month in which the award is to be made. They may be protected between pieces of cardboard in an envelope.

6. A stamped and addressed envelope must be sent for return of the negatives. Every care will be taken of them, but the company accept no responsibility.

7. All prints become the property of the company, but all negatives remain the property of competitors. Thus every one receives the negatives back. In the case of the winning negatives, however, the company will be glad to purchase same by arrangement afterwards.

THE WATKINS SYSTEM OF TIME DEVELOPMENT.

To the Editors.

GENTLEMEN,—From time to time I have seen a great deal written about Watkins' system of time development, and one thing struck me forcibly, viz.: In order to note the time at which the image commences to appear on the plate, it is necessary to keep the plate exposed to the red light in order to do this. How does Mr. Watkins get over the fact that (especially when using fast plates) the plate is pretty certain to become fogged? I watched for somebody else to ask this question, but nobody has, so I am compelled to do so myself.—I am, yours, &c.,

WALTER KEATING, Jun.

61, Dawson-street, Dublin.

[Having submitted the foregoing letter to Mr. Watkins, the latter gentleman has been good enough to send us the following reply. Eds.]

Mr. Keating appears to criticise without having tried the plan. The necessary exposure to the red light involved in my method is less than in the older plan of having to judge the density of the negative by taking it out of the dish and holding it up to the light. After the image has appeared the plate can be covered up and not looked at again, and, as the total time of development is at least five times the appearance, the necessary exposure to red light is quite short.

But, if Mr. Keating will refer to THE BRITISH JOURNAL OF PHOTOGRAPHY for July 28, 1899, he will find details of that modification of my method by which all dark-room light is done away with. The developer is first tested with a standard strip of exposed plate, and the time of appearance of this decides the duration of development of the negative. The negative is then developed in complete darkness.

For the last three years I have used this method with great comfort in developing Cadett spectrum and other isochromatic plates, using no bromide and never getting a trace of fog, with the great advantage of never having to trouble about the "safety" of my dark-room light.

Let me take the opportunity of giving a slight modification of my timing method, which tends to simplicity of working.

It is to always adhere to the multiplying factor six, and to control the steepness of gradation (density) of the negative by the degree of dilution of the pyro-soda developer. The advantage is that the number of seconds' appearance is translated without mental effort into the number of minutes' development. Thus 40 seconds' appearance requires a development of four minutes. The developer may contain from $1\frac{1}{2}$ to 2 grains of pyro to the ounce, according to the negative required, with the usual quantity of bromide.

If it is desired to use this new plan with a developer other than pyro, metol-hydroquinone should be used, the contrast of the negative being decided by the proportion of metol to hydroquinone, the latter in any case being in larger proportion.

ALFRED WATKINS,

WILL STEREOSCOPIC PHOTOGRAPHY REVIVE?

To the Editors.

GENTLEMEN,—There are unmistakable symptoms that it will. One of them is that it is beginning to engross the attention of many photographic societies, as witness the papers read before them, and the excellent examples shown and the approbation they meet with. But the resuscitation of anything that has become extinct, or partially extinct, for the stereoscope has never become really so, is a slow procedure. At the November meeting of the Edinburgh Photographic Society I notice that Mr. William Goodwin read an admirable paper on the subject, an abstract of which you gave a fortnight ago. In his paper Mr. Goodwin made some remarks as to one reason why the stereoscope at one time fell into disfavour, and that is a reason to which you have more than once referred in your columns, namely, the vulgar character of some of the slides that were put upon the market at the time, which almost amounted to indecency. I regret to see some of these slides are now being offered for sale on stalls in the streets, evidently printed from the old negatives, and similar ones—though of more modern production—are to be seen in some of the penny-in-the-slot machines which are to be found in London and other large towns. Some of these pictures—vulgar in the extreme—become something more than that when coupled with the titles given to them. It is sincerely to be hoped that these so-called "comic" slides will never again be introduced into drawing-room collections,

as they were at one period, otherwise I fear that our old friend the stereoscope will not find much favour in good society. It is also to be hoped that some of the subjects that have been shown as "art work" in the nude or semi-nude in some one of our recent exhibitions of photographs will not be essayed for the stereoscope, as that will, certainly, anything but conduce to its popularity.—I am, yours, &c.,

CYCLOPS.

December 10.

WINTER EVENING PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—The long winter evenings are now with us, and many enthusiastic photographers are no doubt speculating as to how they can best turn them to photographic account. The ways they can do that are numerous indeed, though some of them seem to be quite neglected. One is photo-microscopy. Many are no doubt deterred from essaying this branch of photography from the mistaken idea that costly apparatus is a *sine qua non*. It is nothing of the kind, unless we go to the higher divisions of it. For large and popular subjects a microscope, or even a microscopic objective, is not a necessity, for a short-focus photographic lens, if of good quality, will answer the purpose quite well. Every one knows how to enlarge from a small negative, and most amateurs have the necessary appliances for the work. Now the principle of photo-micrography is precisely the same as that of enlarging from a small negative. If, for example, instead of a photographic negative we place, say, the wing of a butterfly, mounted on glass, in the place it would occupy in the enlarging apparatus, we can make an enlargement of it in exactly the same way, and just as sharp as we should get from a negative had one been used, and amplified the same number of diameters. For such things as a butterfly, dragon-fly, large moth, &c., an ordinary quarter-plate lens will answer very well when somewhat stopped down to ensure good definition. For smaller objects a lens of shorter focus will be better, and found more convenient in use. With one of the small lenses of the Petzval type that used to be supplied for postage-stamp portraits, of about one and a half inches focus, I have made very successful pictures of such objects as the proboscis of the blow-fly and similar ones which showed every minutia in the enlarged picture. In using the lens for this purpose it is scarcely necessary to say that the posterior element was placed towards the object to be enlarged. I have said enough to show that amateurs need not be deterred from entering the field of photo-micrography on account of the cost of apparatus, that is, when the operations are confined to such subjects as I have alluded to. I enclose my card, and am, yours, &c.,

PHOTO-MICROGRAPHER.

December 8.

THE INTENSIFICATION AND AFTER-MANIPULATION OF CARBON PRINTS.

To the Editors.

GENTLEMEN,—As the reader of the paper under the above title, referred to in your leader on pages 769 and 770, December 7, 1900, permit me to make some few remarks on your statements.

1. Your assumption that negatives and transparencies only were referred to and treated is altogether wrong. As a matter of fact, I showed, during my paper, negatives, transparencies, and paper prints.

Your statement that the dyes would also dye the paper support is certainly correct, so far as regards single transfer; and I can only think that for the time you had forgotten that there is such a thing as double transfer in the carbon process. If I use the waxed paper temporary support, and use my dyes before the final transfer, I get good, clear whites in my final. This also applies to the use of opal or plain glass coated with collodion, provided your dye is not too strong and that your coating of collodion is not too thick.

The last paragraph of my paper, which reads as follows: "As to their permanency I cannot say. At the same time, I see no reason why they should not stand, providing, of course, that your dye is not a known fugitive, or, at any rate, made to do so by treating with a mordant, chrome alum, or tannic acid, for instance." I quote from your own report, page 729, not 725, as you have it.

To your question as to what the result of using a "fugitive" dye for a window transparency would be after a more or less brief period, I opine, as the carbon process is of itself one of permanence, and the dyeing only affecting the gelatine, that, after the dye had vanished, you would still have your print retained, but, of course, in the original colour. You mention various methods, most of which were known to me. What I sought for was something of a more simple and cheaper nature.

Again, the fact you mention was the first mentioned in my paper and the only one demonstrated to the meeting. I refer to the pot-manganate process. Is this permanent, as you state? I think not, unless you after-treat it with a solution of gallic acid, of which you make no mention.

Here I leave the matter for the present, pleased in the fact that my paper has answered its purpose well in bringing before the photo-

graphic public new methods and old methods, even the old, many very aged photographers of my own acquaintance did not know of.—
I am, yours, &c.,

ERNEST HUMAN.

[In his paper Mr. Human spoke only of *carbon prints*, which we assumed were prints in their finished state, before the dyeing. Every tyro would know, we should have thought, that if the dyeing was done while the pigmented image was on its temporary support there would be no dye transferred from that provided that the picture was reasonably washed. How could this be? With regard to the fugitiveness of some of the coal-tar colours, Mr. Human says that, "after the dye had vanished, you would still have your print retained, but, of course, in the original colour." Yes, but *plus* the tint left behind by the faded dye, because the fugitive coal-tar colours when they fade leave some tint (usually an unpleasant one) behind. Mr. Human asks if the permanganate method of intensification is permanent unless you treat the print with gallic acid. We say yes, speaking from experience. We have both carbon transparencies and negatives intensified with the permanganate of potash more than twenty years ago, and were not treated with gallic acid, that are as good as when first done. Oxides of manganese are permanent pigments to all intents and purposes. EDS.]

FORMALIN AND FORMALDEHYDE.

To the Editors

GENTLEMEN,—Amongst the editorial lucubrations of one of your weekly contemporaries, dated December 6, is an article on the above, which is calculated to terrorise the users and would-be users of this most useful and beneficial body.

Inasmuch as a bath of formalin is an effective operation amongst the manipulations recommended for my new film "Cristoid," it seems necessary that your readers should have the benefit of my somewhat extensive personal experience of its use, and you will place me under a great obligation by finding space for these lines.

I have used the formalin bath (1 per cent. solution) now practically daily for over two years, and the physiological effects described by the editor are conspicuous by their absence, the finger-tips and hands generally are absolutely normal, although freely immersed in the bath whenever used. The pungent effects of the gas liberated during the operation (an infinitesimal quantity) were slightly noticeable on first making its acquaintance, and then they were not to be compared to the inconvenience experienced whilst the domestic onion is being sliced. Not a trace of pain has been felt in the finger-tips, neither have the nails become brittle, whilst the exfoliation of cuticle has proceeded at no greater rate than in the case of any user of developers or other astringent and caustic solutions. I am inclined to think there must have been some mistranslation of the article in the "Photographische Zeitung," or possibly the German article was inspired by some opponent of the celebrated chemical firm who has brought the use of formaldehyde for the hardening of gelatine to the fore. I am of opinion that our friend the Editor would have been better advised to have obtained the experience of workers nearer home.

It would have been more useful to dilate on the noxious effects of ammonia; nitrous and nitric fumes, or even spirits of salts, leave alone bichromate of potash or bichloride of mercury, or possibly he may have drawn attention to the presence of the terrible cyanogen in the poor, odorous, but grateful bulb already mentioned, and the much-wasted mustard. Yet, still better, on the stomach-tanning properties of the teapot.

Formaldehyde ranks now as our best and most useful antiseptic because of its diffusive properties. It is largely used in the hospitals. This would scarcely obtain if the doctors feared the injurious effects on nose, eyes, or lungs. As a matter of fact, the microscopic amount which reaches the membranes must be promptly resolved by the ammonia salts present into formates, which are normal constituents of the blood. The regular user of formaldehyde may, at least, take to himself the satisfaction of knowing that he has perfect immunity whilst in its presence from all diseases depending on an atmosphere-borne germ for their initiation.

Apologising for this trespass, I am, yours, &c., J. T. SANDELL.
December 11.

PHOTOGRAPHS REGISTERED:—

- A. Vivian, Crowle, near Doncaster.—*Photograph of H. Hobson.*
- W. McD. Stuart, South Bridge, Cupar Fife.—*Photograph of G. Thomson.*
- J. Moffat, 125, Princes-street, Edinburgh.—*Photograph of the Rev. A. Henderson, D.D.*
- F. Higgins & Son, Holyrood-street, Chard.—*Photograph of General Sir R. H. Buller.*
- M. H. Hack, Rembrandt Studio, Cheltenham.—*Photograph of General Sir R. H. Buller.*
- Harrison Bros., 168, High-street, Lincoln.—*Eleven photographs of the Lord Bishop of Lincoln.*
- T. Blackman, Exchange-street, Market Place, Peterborough.—*Photograph of Mayors of Peterborough from 1874.*
- W. G. Webber, Grand Studio, Brock-street, Lancaster.—*Six photographs of Mr. Hall Caine's residence. Photograph of M. M. Milovanovitch.*

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

A. McH.—A letter addressed to the gentleman named, care of the Savage Club, London, would, no doubt, find him.

THE ACETYLENE LIGHT.—"CYCLIST" writes: "Will you kindly inform me if it would be possible to take a photograph at night by the help of several ordinary cycle lamps burning acetylene gas?"—In reply: The thing would be quite possible, but a large number of lamps would be required to produce successful pictures.

WHITE INK, &c.—"L. M." asks: "(1) How can I make this? Chinese white, in water, won't flow properly. (2) What is the most suitable kind of commercial dry plate to use for making enlarged negatives?"—In reply: (1) If a little prepared oxgall, as sold by artists' colourmen, be added, the colour will flow well. (2) Any of the ordinary, or slow, plates on the market are suitable for the work.

ARTISTS' CANVAS.—T. A. HEATHCOTE writes: "Could you let me know how to make artists' canvas; I have been using whiting and size, but it is not waterproof, and the paint sinks in the canvas?"—In reply: Making artists' canvas is difficult when doing it on a small scale, and the result is not equal to that which can be purchased. We should advise you to purchase it ready prepared. It may be had in rolls of different widths from those who supply artists' materials.

PHOTOGRAPHING ON SILK.—W. THOMPSON writes: "Would you kindly let me know the cause of the marks on the enclosed piece of silk? I only get this happen now and again. The silk seems to saturate itself evenly with the silver solution, so I cannot account for it. Should be glad to know how to avoid this in future."—In reply: We can only suggest that the silk was not perfectly clean and dry when it was salted, or the salting was uneven. We have not met with such marks ourselves.

BURNISHING PRINTS.—R. HENDRIE writes: "I have got a new burnisher, 10 in. Hanover, but I cannot get the desired polish. Am I to let my cards get completely dry, or what is the best way to prepare them for the bromide? I use Ilford P.O. paper."—In reply: Possibly sufficient pressure is not applied, or the heat is not great enough. The prints should be moderately dry, but not too dry. The prints should be lubricated. A good lubricant is a grain, or so, of Castile soap to the ounce of methylated spirit.

COPYRIGHT.—"R. J. P. S." writes: "A customer has left two illustrations of a weekly paper, bearing date 1862, to be copied, and has ordered several dozen for re-sale, but, before going on with order, would be pleased to know how to proceed in the event of our infringing the Copyright Act?"—In reply: If there is any copyright existing in the prints you would certainly be infringing it. But without knowing more particulars we can give no opinion in the matter.

A QUESTION OF COPYRIGHT.—W. F. WILSON writes: "Two little girls here in an entertainment represented the 'Dirty Boy' of Pears' Soap, and had a large bowl with Pears' name printed thereon. As the original is copyright, is it wrong to make up as such, and can I photograph these little girls as such?"—In reply: It would not be an infringement of copyright to make a "living picture" like the painting. That was decided in the case of *Hanfstaengl v. The Empire*. But if the living picture were photographed it would seem that that would be an infringement, according to a case decided some years ago in the north.

DARK ROOMS.—"M. J. W." writes: "I am about to make a dark room inside another room. The space I have at disposal for its width is 6 ft. 6 in. I wish to economise space as far as possible, yet not so as to limit unduly my dark room, which I wish to be large enough to permit of using an enlarging camera, and for general work. Will you kindly suggest what you think would be the best length which would suit the above requirements?"—In reply: Twelve feet would be a convenient length for working. But if it were a little longer it would be still more convenient, especially if the enlarging is done with the lantern.

COPYING DAGUERREOTYPE.—"C. and Co." say: "We have a Daguerreotype brought to us to copy, and, as we have never had such a thing to do before, we shall be glad if you can give us any information as to how to proceed. We know the thing is very difficult, and we have been told that it is impossible to get a presentable copy of a Daguerreotype."—In reply: There is no difficulty whatever in getting a good copy of a Daguerreotype; indeed, as a rule, they yield excellent copies if they are properly lighted. Place the picture so that it is lighted by a strong direct side light (stopping off all front light), so that all reflection from the surface is away from the lens. Under these conditions an excellent result may be obtained.

** Many answers to correspondents are unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

What some readers think of the book:—

- "A splendid ALMANAC."
- "A handsome present."
- "Grows bigger and better every year."
- "More interesting than ever."
- "More copious and more useful."
- "A necessity to the busy worker."
- "Better than all its predecessors."
- "I congratulate you heartily on issuing such a good book."
- "Most acceptable and useful."
- "Grows more valuable and interesting every year."
- "A capital issue."
- "Excellent in every feature: the letterpress, diagrams, tables, and illustrations are most helpful."
- "A first-rate and exceedingly cheap publication, fully up to, if not beyond, the standard of former years. . . . A combination that must mean continued and strengthened life."

* * * The 1898, 1899, and 1900 editions of the ALMANAC (20,500 copies) were each sold out within a few months of publication.

* * * Of the 1901 Edition, just issued, over 19,000 have already been disposed of.

EX CATHEDRÀ.

THE position and future prospects of the Camera Club have recently engaged the serious attention of the members of that body, and, as some misapprehension has arisen in connection with the precise state of affairs in Charing Cross-road, we think it desirable to make public the following details. A few weeks ago the present Executive intimated to members an inability to carry on the Club after December 31 of this year unless an increased subscription were agreed to. The responses to the Committee's suggestion of a raised subscription were not numerous enough to meet the requirements of the case, and consequently, at a largely-attended meeting of the members, the Committee intimated their intention of winding up the Club at the end of the year. This decision, however, was in no way binding on the members of the Club, and those present at the meeting referred to, in number about eighty, unanimously appointed an Advisory Committee to take into consideration the best means of carrying on the Club. On Friday evening last a second general meeting, as largely attended as the first, was held at the Club house, and the report of the Advisory Committee was adopted. From this report, a private document of great length, we, of course, do not feel ourselves at liberty to make any extracts, but we may say that its suggestions are of such a nature that, if properly carried out, they should assure to the Club a successful and remunerative future.

* * *

THE position of affairs, then, is roughly this: The old Executive of the Camera Club is preparing to shortly terminate its responsibilities of administration, whilst the sponsors of the new scheme are perfecting its details with a view to taking over the control of the Club at an early date. Meanwhile, the Camera Club, as such, goes on as usual, and, although the transition period of the next few

weeks or months is bound in the nature of things to be a time of uncertainty and anxiety, we have the best reasons for confidently expecting that the interruption thus made in the Club's career will be of a temporary kind only. We have good grounds for saying that hundreds of members of the Camera Club are concerned to assure and improve its future. There is no question whatever of discontinuing the Club. That is a subject upon which there has been no discussion at all. The whole aim of the general body of members is to place the Club's future existence on a solid foundation. A general scheme of reformed administration has been adopted. In carrying it out great changes in detail may be safely anticipated; but the exact nature of such things it is impossible to forecast. Of one thing, however, we can speak with the strongest confidence. It is this, that within the Club there exists a large body of able and influential men with the power and the will to carry on the Club successfully in the future, and, in our mind, there is no doubt whatever that they will succeed in their object.

* * *

A KNOWLEDGE of the Camera Club, for about ten years, a considerable part of which period we have enjoyed the honour of membership, has given us exceptionally good opportunities of forming an opinion of the chances of the Club's future success as a social centre for those interested in photography. We, for our part, have no hesitation in predicting a new career of the most marked prosperity for the Camera Club, if that institution be administered in a business-like and alert manner, and the responsible officers, whoever they may be, are imbued with broad-minded and progressive notions of management. Most emphatically do we affirm, from knowledge and observation, that there is more room for the Camera Club than ever there was. We sometimes hear it said that the photographic craze of 1885, when the Club started, has died out, and with it the necessity for such an institution as the Camera Club. We quite distinctly recollect the growth of the amateur photographic "craze" of the years 1883-1885, if craze it could be properly styled. We do not think it could. For every amateur photographer of that time there are probably at this day scores. We are asked to believe that the photographic "craze" had come to a head well before hand-camera times, before cheap plates, rollable films, radiography, animated photography, the Lippmann, Ives, and Joly processes of colour photography, before photo-typically illustrated newspapers were produced, before the photographic industry was half its present size, and when THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC was only about a fifth of its present dimensions—300 pages, instead of 1500! Absurd! In reality, the so-called "craze" of 1885 was nothing but a tardy realisation of the great power which gelatine as an emulsifying vehicle had previously placed in the hands of photographers. The "craze" for photography, if we must use the unsatisfactory term, is at this time much keener than ever it was, and we, at any rate, expect to be many years older before its limits have been reached.

* * *

FROM its original standpoint of a centre for amateur photographers, the field before the Camera Club is, we think, broader, not narrower, than it was fifteen years ago. Professional men and members of the leisured classes, men of science and investigators, travellers, naval and military officers, and others to whom a club is a necessary part of

social life are now more numerous, if our opportunities of observation do not mislead us, than in 1885. Men of this kind, in London and the country, who do not know of the Camera Club and the social and photographic facilities it affords, would probably join in considerable numbers if some means of reaching them were devised. The Club premises are centrally situated, all the usual conveniences are at the disposal of the ordinary club man, and the photographer may have the use of dark rooms, studio, and so forth. We have heard it said that such a combination of facilities as this does not exist anywhere else in London, if in the world. We most gladly add our testimony to the excellent spirit of gentlemanly good feeling which invariably pervades the Club. The lectures, held twice a week, are attractive and varied in subjects, and are always well attended. Of how many West-end clubs can it be said that interesting lectures are made a feature? It is not necessary further for us to dwell on the pleasant features of club life that may be enjoyed in Charing Cross-road. We write of them from intimate personal knowledge and experience, and in the belief, as we have already said, that if the Camera Club were more widely known it would not suffer from lack of members, but would probably find it difficult to accommodate those who had gained or were seeking admission. Our sole object in writing these lines is to encourage those who contemplate taking upon themselves the future task of conducting the Camera Club, and we sincerely trust that no other interpretation will be put upon our remarks. As the leading social club for photographers in the world, there appears to us to be a fine field of usefulness before the Camera Club, and we wish the utmost success to those who have made up their minds to stand by the Club and "see it through" what we are convinced is merely a temporary and by no means acute difficulty.

* * *

THE last number of the "Journal" of the Photographic Society of Philadelphia contains a report on "Etching Matte," a recently-introduced print-out platinotype paper. The report was presented by Mr. C. Yarnell Abbott, an able photographer, with whose work we have for some time been familiar, and it will be seen that he met with only partial success with the new paper:—

"The directions furnished with the paper state that printing, which should be done in the sun, should be continued until 'the image is well defined and the shadows assume a deep canary colour.' Practically, I found that the image printed out very little more than with Willis and Clements or Bradley paper. The printing time is about twice as long. Development is absolutely simple. The print is immersed in clear water which may be of almost any reasonable temperature, although I fancied I got best results at about 74°. The prints flash up very quickly, but there does not seem to be any danger of over-development as with the 'development' papers. They are then cleared in a weak acid bath—about one drachm of hydrochloric acid to the quart of water. Five minutes' clearing and ten minutes' washing in running water are said to be sufficient.

"The circular claims that, by the use of water of different temperatures applied locally in development, great latitude is obtained, the rule being, 'the deeper the printing the colder the water,' and vice versa. Theoretically, therefore, warm or hot water may be applied locally to force detail in the whites of the print, as in bringing out clouds. Along this line, however, I had very little success. As you will

see by some of the prints, there is a tendency to chalkiness in the whites, and no amount of hot water applied locally seemed to affect this, or to bring out detail."

* * *

MR. ABBOTT goes on to testify to the simplicity of the process and the durability of the results, but, on the whole, he does not seem to have been more successful with this print-out platinum paper than English photographers with similar picture-making surfaces that have been introduced into this country at intervals during the last twelve or thirteen years. At the same meeting of the Philadelphia Society, Mr. G. D. Firmin presented a report on Eastman's sepia paper, which he said is almost a "printing-out paper," as the image is quite distinct before development. The reporter furnished the following details of this process, which may interest some of our readers:—

"The paper prints somewhat more quickly than platinum. Development is as with blue-print paper, with water, which washes out the unaffected salt. Three changes of water will suffice. The print becomes yellow in the water and paler as the sensitive salts are washed out. The regular proceeding is now to *tone* the print in weak hypo solution. It is not, however, necessary to do this, and various modifications may be employed, as hereafter described. The instructions accompanying the paper say, Wash in two or three changes of water; then immerse in hypo solution $1\frac{1}{2}$ grains to the ounce. I believe a still weaker solution gives more control and therefore better results. In the hypo bath the print changes to a pinkish brown, becoming eventually a rich chocolate-brown. 'The tone depends upon the time in the hypo bath,' i.e., from 'pink' brown to dark brown." Eastman sepia paper has been on the American market for some time. An absolutely new photographic printing process would be a difficult thing to desire nowadays, but it is interesting to note the great amount of attention which the introduction of modifications of old printing processes invariably excites amongst photographers. There is a constant demand for an "ideal method," which in all probability will never be forthcoming, for the simple reason that the matter of printing affords scope for the exercise of such a wide variety of tastes that their gratification under one head is neither practicable nor possible.

THE PRESERVATION OF CAMERAS AND SLIDES. We should not like to hazard a guess at the number of millions of pounds sterling invested, in the hands of amateur and professional, in various kinds of photographic cabinet ware, including even nothing beyond simple cameras and slides. Though the Americans are beginning to run us closely, Great Britain still enjoys pre-eminence undoubted in this manufacture, and is responsible for the finest examples the world can produce. We saw the other day in a letter from one of our best makers, in reply to some laudatory words from a customer, a very pregnant sentence. "Yes," wrote the maker, "I suppose you will want me to do it up again in another thirty years." The camera and slides which were in question had just been "done up"—to adopt the maker's phrase—after daily hard use for thirty years, and we learnt that it would not have been sent at all but for some alterations and additions that were required. Yet how many of these millions of pounds' worth that we speak of are there in good order after ten years' possession, or after five, or even after two years? Naturally, as

changes in mode of work take place, and improvements are instituted, there is a tendency to throw aside the old and take up new patterns, relegating the discarded ones either to the lumber-room or the auctioneer's hammer. Making all allowances in this direction, there still must remain a vast store, both of British and foreign, that have been in the owners' possession for a long time, and to these more particularly is our query pertinent. There can be no doubt whatever as to the large proportion of those falling in this category being out of order, in one way or another, camera or slide, or both, and mainly through want of a little care and attention at the right moment. Damp, from one source or another, is responsible for most of the cases, careless exposure to dust and sun ruin many, while abroad, especially in tropical regions, we have, in addition to these, the evil wrought by insect pests. In a country like our own damp is a difficult enemy to fight, however good the instruments employed may be. It is not always damp per se that does the injury, it is the pulling and straining of the camera or slide after damp has been absorbed. The very highest class of woodwork is liable to absorb moisture if laid aside in a damp place, the shutters of the slides jam, or the sliding portions of the camera stick, and then the inevitable main force is called into play, with the result of a strain or a break. This is the simplest instance that occurs even when a fair amount of care has been taken. We have seen a camera left in a room in a newly-built house that appeared dry, but which had sufficient moisture to cause every one of the slides to jam. When, however, an accidental shower has caught a camera, and it has been packed up wet, and never attended to when brought home, when slides are taken into the dark room and handled with wet fingers, or splashed with developer or other solution, and left for it to dry on, when they are stored away in winter time, the season's work being over, in any out-of-the-way place, dry or otherwise, and on bringing into use again it is found that the woodwork has sprung, the leather is peeling away, we think it by no means undesirable that the whole set should go wrong and need replacing. The owners of beautiful examples of the cabinet-maker's art who will treat it no better than that deserve no pity, but rather to be compelled to buy another outfit. Every day after a camera has been used it should be most carefully dusted and dried, and occasionally all the woodwork most carefully rubbed and polished to remove accidental finger-marks, &c., and to polish off that deposit from the air which attaches to every polished object after a time. The thrifty housewife knows that her furniture keeps all the better for constant cleaning and rubbing, and a similar need exists with regard to camera work, though it has to be attended to more deftly and carefully.

The exercise of the greatest care will not always suffice to prevent the effects of damp in causing woodwork to swell, and to avoid this all metal cameras have been designed, but never had much vogue, though some of the recent popular Kodaks are mainly metal. But we think that if British conservatism could only be overcome great improvement would be found possible by adopting some of the more recently-invented means of treating wood to render it damp-proof through and through. We have seen stores of mahogany more than thirty or forty years old, and no self-respecting maker would use any but the driest of wood for cameras or slides, seg-dried being considered the best. Obviously, this ageing must add to the cost of the wood, and any process

which, without interfering with the ease of working or detracting in any way from the strength, elasticity, or other needful qualities, if fairly put upon the market, ought to receive every consideration from the camera maker, and, if found good, be adopted.

When we come to consider the ravages wrought by insect pests in tropical regions we trench on a topic which perhaps might be better treated by local experts. It is, however, obvious that an air-tight metallic case would have the double effect of keeping out insects and preserving the camera from damp, the hot, damp air of the tropics having a deadly effect upon glued work, ruining woodwork generally. With regard to that particular pest, the white ant, we have been informed by a large exporting camera-maker that if Russian leather be selected as a covering it will keep these ants away altogether as long as the special odour of the leather remains. We give this hint for what it is worth. If any reader should test its value, and communicate the result through our columns, it might be of assistance to his brother workers. But, ants or no ants, in tropical or temperate zone, let every one possessed of a camera pay some respect to it and handle it tenderly, and look after its continued well-being.



The Connection between Electricity and Light.—

The *Photographisches Wochenblatt* draws attention to a discovery Lenard has made, which may be of importance. In view of the fact that ultra-violet light possesses the power of discharging electrically charged bodies, Lenard has endeavoured to ascertain what becomes of the electricity, and finds that it is converted into cathode rays, which pass into space. It is remarkable that a charge of negative electricity is only once converted into cathode rays by violet light, and that cathode rays may be generated and transmitted in a vacuum such as may be produced by the best air pumps of the present day. It has hitherto been considered impossible that an electrical discharge can take place under such conditions. Lenard has also discovered that cathode rays generated in such a manner have only one-thirtieth the rapidity of light. They are in fact the slowest rays known to us. The speed of transmission of induced electricity surpasses very considerably that of light. It is to be expected that Lenard's discovery will explain many photo-electrical phenomena. The connection between light and electricity indicates prospects of great technical importance.



Awards at the Paris Exhibition.—Exhibitors who have been awarded a "grand prix," gold, silver, or bronze medals, will receive a diploma and a bronze medal, which has been designed by M. Chaplain of the "Institut de France." Exhibitors who have received "honourable mention" will be given a diploma, and those who are "hors concours" will receive a diploma to that effect and a bronze medal. Workmen, engineers, artists, and others, will receive similar honours to the exhibitors. The medals are 63 mm. in diameter, and those entitled to gold or silver medals may obtain them from the Paris mint by paying 710 francs and 22 francs respectively. The fineness of the silver medals is 950:1000, and of the gold 916:1000. The silver medals weigh about 130 grammes, and the gold about 200 grammes.



Enlarging.—The *Photographische Chronik* refers to the question, which is often asked, as to the lens with which an enlargement should be made. The reply is frequently given, that the same lens may be used with which the negative was taken. But it is evident that the best results may not be secured by such means, for a lens may have had to be stopped down considerably to obtain sharp marginal definition, in which case the inverted process of enlargement will be rendered much more difficult. The best lens to use is one of modern type, corrected for astigmatism, and with large aperture.

Such lenses have greater covering power, and, as this favours the use of a large aperture and a shorter focus, the work of enlarging will be greatly facilitated.

Weighing small Quantities.—We also notice another remark in the *Photographische Chronik*, that is worth remembering, in case small quantities of chemicals have to be weighed off for photographic purposes, which is frequently the case. We suppose few photographers are possessed of a good chemical balance, and the usual dark-room method of obviating the difficulty, to which we have referred, is to make a solution of considerable bulk and measure off a small quantity representing the amount required. But there are many substances that deteriorate rapidly in solution, and the method may thus become rather expensive. The *Chronik* recommends that such substances be intimately mixed with pumice powder, silica, or some other substance indifferent to the action of water or other fluids. By using such mixtures small quantities may be weighed off in a fairly accurate manner.

Palladium Toning.—The *Photographische Wochenblatt* contains an article by J. Joé giving details of a palladium toning process for silver prints. Plain salted paper is recommended as the most suitable, but commercial gelatino-chloride and collodio-chloride papers may also be used, in which case sepia tones prevail, unless combined palladium and gold toning is resorted to. There is much similarity between palladium and platinum toning, with regard to colour and other characteristics. The prints do not lose so much in fixing as when toned with iridium, and they should be printed to about the same depth as for platinum toning. It is very important that the prints should be thoroughly washed before toning and before fixing. Insufficient washing before fixing is followed by yellow stain, a fact which may be taken advantage of if the effect of an engraving upon toned paper is aimed at. It is also important that the bath should be acid. A strong bath favours black tones, and a weaker bath sepia and brown. Joé recommends the following formula:—

Potassium palladio-chloride	1 gramm.
Table salt	10 grammes.
Citric acid	10 "
Water	2 litres.

After taking the print from the frame, immerse it in salt and water, thoroughly wash it before toning, and again thoroughly wash before fixing.

The following bath gives very agreeable chocolate brown tones:—

Potassium palladio-chloride	1 gramm.
Molybdate of ammonia	10 grammes.
Citric acid	10 "
Water	2½ litres.

Palladium is an expensive toning process on account of the high price of the metal, but there is some compensation in the fact that more prints may be toned with a given quantity of it than with gold.

ON THINGS IN GENERAL.

SOMETHING for nothing; that is what the gulls in the Tanquerey swindle expected, now they are whining because if they are to get something they have to pay for it! Tanquerey is evidently a keen student of human nature, and he knows how deeply implanted is the desire to "pick up a bargain," to get something "on the cheap," as it is often tersely, if vulgarly, put. Traps without end for hundreds of years past have been set with the same bait, and with constant success; but naturally the bait has to be changed from time to time to keep it from getting stale, though a considerable lapse of time is often needed before that comes about. The free portrait bait is a good one, undoubtedly, and one could almost forgive its originator if he would only return original photographs when his bait was not swallowed; but the admiration that might otherwise be felt for the ingenuity of the trick vanishes when it is seen that the fellow is only a common cheat clever enough to escape the meshes of the law. But I should like to put a question on this matter, "Are photographers

itirely blameless." Time was when they stood upon their dignity; ut nowadays there are so many who teach the public the small value they attach to their own productions by reason of free sittings offered under specious pretences; unlimited number of proofs to select from, unlimited free "retakes," that there is, after all, not much to be surprised at when a foreigner offers to do just the same thing, something for nothing."

When platino-bromide prints were first introduced I objected strongly to the name, as it lent itself to either deliberate fraud or unconscious misrepresentation. It will be scarcely credible to the more scientifically educated photographers, but it is, nevertheless, a fact that some photographers are under the impression that platino-bromides contain platinum; little wonder then that we should at last have a case brought into court where it has been advanced that bromides "may not be exactly quite the same, but they are identical as regards appearance," as platinotypes. I do not remember having before this seen a case brought into court to remedy the fraud of bromides supplied in lieu of platinotypes, and it is very remarkable that such a case should not yet have been brought, for the evil is rampant. I know of a case of a well-known photographer in a large way of business who carries on this fraud systematically, if all I hear is true: I do not doubt it. It is not merely that the purchaser is defrauded—*caveat emptor*—but the process of true platinum printing is brought into disrepute, and reputable photographers are apt to be told platinotypes are not permanent. The evil is so great that it becomes a question whether some endeavour should not be made to stamp out such fraud by concerted measures taken by photographers generally. If photographers are to hold their own, and too many find it hard enough to do so of late years, some steps should be taken to prevent a slur being cast on the profession by such fraudulent practices as these.

While discussing platinotype matters, one naturally turns to a recent discussion at the L.P.P.A. upon sepia platinotypes, and sundry further discussions thereon. This is all very like flogging a dead horse. True, there is no harm in talking of platinotypes of other days; but why not go back to the very first platinotypes with their lead salts if we are to discuss platinotypes as they were? Surely most users of this beautiful process are aware that there is no mercury employed in sepia platinotypes at the present time; if not, they ought to be, and they had better peruse the booklet issued by the Company with full instructions. The only difference between a sepia and a black tone developer is that acid is added for the former colour. A special solution used to be sold, but there is no need of it now. The real difference lies in the paper employed, that chosen for sepia is of entirely different manufacture from that used for black tones.

The "permanent processes" have been to the front of late, in an unusually strong fashion, and the Editors have given a useful and timely lesson on making reversed negatives which do not require the trouble of "double transfer" for printing in carbon. There is one little point when making reversed negatives, by taking the picture through the glass, and that is—take special care that the springs of the dark slide back do not scratch the surface of the plate! This can easily be avoided if the need for care is remembered—a piece of brown paper doubled up three or four times is springy enough to take up the pressure and prevent it reaching the film itself. Some films are much more readily scratched than others; but all alike need some precaution taken. Double transfer is liable to an inconvenience not often referred to: when the print is taken off waxed glass, sufficient of the wax adheres to it to render it most difficult to paint upon, and a good deal of benzole is needed before this film, which is surprisingly repellent, is removed. A little prepared oxgall is a great help, and when colours are used it is better to employ the colourless prepared oxgall for artist's use, it is almost as colourless as water.

In reading the account of the Croydon Club Meeting, I note a reference to a new print-out paper requiring no toning, and it is stated that the occasion was the first time it had been used in England. Doubtless the remarks were intended to apply to this particular kind of self-toning paper, and not such papers in general, for during the last few years quite a number of self-toning papers have been placed upon the market, all "requiring no gold." The rationale of the "toning" is pretty obvious, especially when we read the in-

structions of many of them—hypo fixing at a maximum strength of five per cent. It is very unfortunate that such modes of printing should be recommended, every one knows of the evils which lurk in the path of very weak fixing solutions.

With regard to Mr. J. A. Reid's comments on what I wrote with reference to the illustrated press, I take it that there is a very great point of difference between us, but as he speaks of traversing my statements I might perhaps add a further word or two, though, the tone he takes is one no one could take umbrage at. He refers to editors and proprietors of papers. "As a matter of fact, in many cases it is the editor—the proprietors may not be consulted." Well, I think we both have the same paper in view, and certainly in that case, the proprietors are not only consulted but have a lively ultimate voice in the matter. I could give some lively examples if necessary. "The point was that there are people who do not think photographs of Royalty, especially of Her Majesty, should be exploited for the benefit of one particular paper." But is it so? I think Her Majesty has sat to several photographers. A weekly retaining fee is not suggested as being paid to all. I never said that the degradation of the illustrated press came from the portrait department, nor did I mean to infer it. "If we cannot prevent the force of circumstances why shed aimless tears." I don't know that there was anything particularly lachrymose in my remarks; and as to preventing the force of circumstances, well, if we cry "Delenda est Carthago" long enough we may perhaps not destroy those editors, but bring them to a proper sense of their relations to photographers, and stop the five-shilling idea. As to there being no compulsion in the matter, is there not? Is there a photographer living who if asked to go and take a photo of Her Majesty for an illustrated paper would not gladly do so? He would be glad of the kudos to aid his business, but the papers won't recompense him now to the extent that would have been possible in the 80,000 order days. I may say that as to the papers worth while sending photos to, there are very nearly a score now. However, as I said, I don't think there is much real difference of opinion between me and Mr. Reid, so I will say no more.

FREELANCE.

REDUCERS.

THE operation of reducing the intensity of the silver image may be effected, as is well known, by various processes, which may be divided into two classes according to their results:—

1. Reducers acting uniformly on the different parts of the image.
2. Reducers acting on the most opaque parts of the image.

To the first class belong the peroxide salts of cerium, the mixture of potassium ferricyanide, and hyposulphite of soda, and a certain number of other metallic salts of which we have already pointed out the properties.

This method of reduction is used in every case when one wants to increase the contrasts of an over-exposed negative. On the other hand, the second method is employed when an under-exposed negative has been over-developed, for then one wants to reduce the image without losing any of the details which may be insufficient in the more transparent parts of the negative.

This method of reduction may be effected either by an indirect process, or by means of peroxide compounds, endowed with similar properties to oxygenated water.

In the first process, which was suggested by Eder, the whole of the silver of the negative is transformed into chloride by the action of ferric chloride, and then developed by a slow-acting developer, the development being stopped before the negative has become too opaque, the chloride not reduced is dissolved out by hyposulphite of soda.¹

This method which is based upon a very interesting principle, is extremely delicate in application, because it is difficult to determine the exact moment to stop the action of the developer.

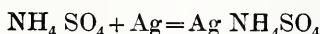
¹ Eder's later method is by the use of a mixture of hydrochloric acid, bichromate of potash, and water, and alum, and this is preferable to the use of ferric chloride. McIntosh suggested an improvement upon this in the use of bromide and bichromate of potash and nitric acid.—EDS.

In the second process, the persalts such as the persulphates, and especially ammonium persulphate, are used, which can play at the same time the rôle of an oxidiser or a reducer according to the conditions under which it is used. Besides ammonium persulphate (NH_4SO_4), the uses of which we were the first to point out, and to give a detailed method of its use,¹ two other substances have been pointed out which give precisely the same results as does ammonium persulphate.

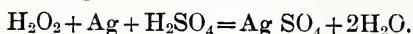
One of these is oxygenated water or hydrogen peroxide in an acid solution, suggested by Dr. Andresen² the other is the permanganate of potassium in acid solution which was suggested by Prof. Namias,³ in the following formula:—

Potassium permanganate.....	0.5 parts.
Sulphuric acid (strong).....	1 part.
Water.....	1000 parts.

It is admitted that ammonium persulphate and hydrogen peroxide in acid act in an analogous manner on the silver of the negative, the former in giving a double sulphate of silver and ammonia according to the equation



and the second in giving also a silver sulphate if sulphuric acid be added to the hydrogen peroxide, and according to the equation



To explain the peculiar action of ammonium persulphate which reduces more rapidly the dense parts of the negative than the thin, we have to take into account the secondary reducing action which ammonium persulphate possesses in the presence of the double sulphate of silver and ammonia, a reaction which may be represented by the equation



An exactly analogous reaction may be obtained with acid hydrogen peroxide:—

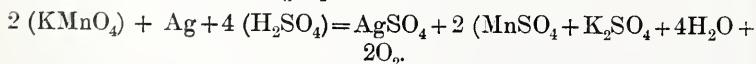


We have thought that this inverse action of the principal reaction tended specially to take place on the outside of the gelatine film, where the double sulphate of ammonium and silver exists in the presence of an excess of persulphate, whilst in the interior of the film the persulphate is only used to dissolve the silver of the negative, the inverse action taking place with much more difficulty owing to the absence of any excess of ammonium persulphate. This hypothesis, which is equally applicable to hydrogen peroxide, may, to a certain extent, explain why the dense portions, which include a much greater portion of the thickness of the film than the transparent parts, are more rapidly dissolved than the latter by the persulphate of ammonia.

Our theory has been discussed by various authors, but up to the present time no one has given a satisfactory explanation of this curious phenomenon.

The action of permanganate of potash in the presence of sulphuric acid may be equally explained by reactions analogous to the foregoing.

We may, in fact, suppose that the solution of the silver takes place according to the following equation:—



As regards the inverse reaction of the permanganate on the silver of the transparent parts which is on the surface of the film we may assume that it has a tendency to deposit silver on these parts according to the equation:—



as in the case of ammonium persulphate or of hydrogen peroxide.

Finally we may point out the negative results which we have obtained with a whole series of peroxidised bodies, which we thought *a priori* ought to be substitutes for ammonium persulphate. We recognised that a small number of these substances tended to trans-

form the silver of the image into oxide, and gave a slight intensification, others had no action on the image when employed in a neutral or acid solution.

The compounds we have tested are: periodates, iodates, iodic and periodic acid; perchlorates, chlorates, perchloric and chloric acid; bromates, permolybdates, pertungstates, pervanadates, alkaline perborates.

In conclusion we may sum up by stating that substances capable of reducing negatives, by attacking the opaque parts more rapidly than the transparent, appear to be small in number, and only act in an acid solution. This class of substances seems to be limited to the persulphates, to hydrogen peroxide, and permanganate of potash in acid solution.

Therefore, these are compounds, which, although peroxidised, differ very notably, from the point of view of their chemical properties, from reducing substances acting simultaneously and uniformly on all parts of the picture.

MM. LUMIERE and SEYEWETZ.

BELGIUM—A RETROSPECT.

III.

Of the important buildings erected in recent years, first place must be given to the Palais de Justice. It is true that it took nearly 20 years to complete, and that it cost about two millions of money; but the people of Brussels have something worth looking at for the money and worth waiting for. A magnificent structure 400 feet high, and of both elegant and substantial proportions, is more in accordance with the object of its erection than our Royal Courts of Justice in London, the design for which, to the casual observer, seems to have been specially prepared with a view to using up a conglomeration of second-hand building materials.

Another fine building is the New Exchange on the Boulevard Anspach. The most recent new Post Office opposite the Théâtre de la Monnaie is a great improvement on the old Jesuits' Church, where the postal business was carried on for many years. This old church was demolished a few years since, and an elegant fountain now occupies the site.

Of the many museums in Brussels, perhaps the most astonishing is that of the eccentric painter Anton Joseph Wiertz. This should certainly be seen, as it is far removed from the "usual thing" in Continental paintings as it is possible to imagine.

The environs of Brussels contain many spots well worth seeing. Laeken, with its Royal Palace, monument to Leopold I., and prettily laid-out cemetery, where will be found the grave of the celebrated Madame Malibran. The quaint old church of St. Mary adjoining has recently been pulled down, leaving the unfinished new church with its octagonal east end in all its glory.

The Bois de la Cambre is easily reached by tramcar from the Place Royale, and many excellent pictures may be obtained there without let or hindrance.

The field of Waterloo still has its attractions for English and American visitors, although 85 years have elapsed since the memorable battle. I paid a visit to it in 1863, but have felt no inclination to repeat the experience. I understand the relics still hold out, although not so plentiful as at one time; the same old stories are related, and have lost nothing by repetition. I thought years ago, it would be better if the incident of Waterloo were forgotten, and, possibly, no one would regret it but the guides who kindly meet you on your arrival. Latterly, however, I have come to the conclusion that perhaps a reminder of the victory of June 18th, 1815, on that side of the Channel, is not altogether undesirable.

Mr. Taylor and I had been talking about the new Waterloo Monument which had recently been unveiled at the cemetery at Evere, and when at Brussels thought we would like some photographs of it. So one fine morning we took the steam tram from Josse ten Noode, and in due time arrived at the cemetery. Here, however, we received a check, the gatekeeper politely, but firmly, declining to allow us to take our cameras with us. We explained that we only desired to photograph the new monument towards which the English people had subscribed so much, but it was no use. "You cannot photograph it," said he. He kindly offered to take care of our cameras while we went to see it, however; and this offer we accepted. He pointed out the direction in which we should find the interesting monument, and after some difficulty we discovered the spot. Here we found an

¹ Bulletin de la Société Française de Photographie, 1898.

² Photographische Correspondenz, 1898.

³ Bulletin de la Société Fot. Italiana, 1899.

erection covered with canvas, and, on looking inside, the object we had come so far to see was carefully wrapped up in dirty cloths, closely tied round with rope. We looked at each other for a moment or two, and then I'm afraid we forgot our surroundings and laughed long and loudly. When we returned to the gate the porter politely handed us our cameras. I thought I detected a twinkle in his eye as he did so, but that may have been fancy on my part. We often spoke of this episode afterwards, but were never quite sure whether the man misled us intentionally or unconsciously. Why there should have been so much difficulty placed in the way of obtaining photographs of this monument I do not know; but, although I took considerable trouble to do so a year or two afterwards, it was only by a ruse that I succeeded.

During the last twenty years few places have changed much less than Ghent, more especially in the older parts of the city. The Town Hall is still smothered up by comparatively narrow streets. The belfry still wants repairing; the cathedral, with its fine pulpit of oak and marble; the front of old St. Nicholas; the corn market; and the old Marché du Vendredi, are as interesting as ever, and the beautiful statue of Jaques van Artevelde (erected in 1863) is still considered one of the most lifelike in Europe, although the accumulated dust of nearly 40 years might be removed with advantage. By the bye, the study of this naturally-posed statue might be a lesson to some of those sculptors whose inanimate-looking effigies stand solemn sentry in our English open spaces.

The great Béguinage has always been considered one of the attractions of Ghent, and a visit to this religious lace-making community is generally regarded as indispensable to those taking any interest in such institutions. The entrance gates, the little church, and quaintly-arranged buildings make a capital little series of views, and if the interior of the church, with its dimly-lighted aisles and hundreds of nuns and novices at vespers, could only be reproduced, it would form one of the most effective and devotional pictures possible. In 1884 I tried to obtain a photograph of the sisters as they left the church after their early morning service. The weather was propitious, and I took up my position and waited. I had ascertained the hour the service usually concluded, but it was some time after this, and still no Béguins appeared. At last, getting somewhat hungry and impatient, I went over to the church and looked in. It was empty; they had all departed by the little back-door near the altar.

The ruins of the ancient Abbey of St. Bavon, dating from 1179, are always worth revisiting. But the Lourdes (about two miles from the Pays de Waas Station), with its new church and enlarged hotel, is a comparatively new institution. It was after a visit to the Lourdes (in order that Mr. J. Traill Taylor should snapshot some of the grottoes and piles of crutches and sticks left there by believers in the curative power of the Holy Well) that my companion espied in the window of a little shop in the Rue d'Anvers a fine piece of Gorgonzola. "Now for some fun," said he; "see me talk French." I followed his burly form into the small establishment, where a buxom woman stood smiling behind the counter. "S'il vous plaît?" said the lady, inquiringly. Mr. Taylor pointed to the cheese with his right hand, and in the other held up two 10 centime nickels; "Tippence," said he. "Pardon, monsieur," said the lady. "Tippence, tippence," reiterated Mr. Taylor. Then the lady suddenly comprehended what was desired. "Ah! oui," said she. In almost less time than it takes to relate, she had taken the cheese from the window, cut off a piece which she wrapped up carefully and handed to him in exchange for his "tippence;" and he came out of that little shop beaming with pride and satisfaction.

One of the most interesting cities in Belgium is Bruges. It is now only a shadow (so to speak) of its former self. In the fourteenth century we are told it was the commercial centre of Europe. In the sixteenth century its population was 200,000, and the pride and arrogance of the Flemings at that time is well exemplified by the following anecdote. A repast was given by one of the Counts of Flanders to certain Flemish magistrates, and the chairs they occupied were unfurnished with cushions. The proud burghers not being satisfied with the bare seats, folded their valuable cloaks and sat upon them. After the feast they were retiring, apparently forgetting these costly articles of dress, of which a courtier begged to remind them; but the Burgomaster of Bruges replied, "We Flemings are not in the habit of carrying away the cushions after dinner!" and the whole of the cloaks were left behind.

During the present century Bruges has always been noted for the number of paupers it contained. Sixty years ago, out of a much

reduced population of 43,000, it was estimated that 18,000 were practically paupers during the winter time. The population at present is about 54,000, but quite 20 per cent. are paupers. Ordinary visitors would not suspect such a state of things, for there is little or no mendicancy, and, although the inhabitants are certainly a "slow-going" lot, they appear to be fairly prosperous. The city abounds in photographic subjects, the Grande Place alone furnishing several. This square was remarkable years ago for the number of estaminets and restaurants contained in it; one side alone had 13 such establishments. In 1887 a very fine monument was erected in the centre of the place. The ancient "Lion" house still remains, but several old houses have been removed to make room for the new Post Office and other buildings. The famous belfry is, of course, the great attraction of the square. How many times this has been photographed during the last few years, either from the square or the well-known spot, Quai de Rosaire, it would be rash to hazard a guess. The chimes are said to be the best in Belgium, and when in good order are certainly very fine. A few years ago they were in a terrible condition, and it was difficult to make out what the tunes were intended for. They reminded one of a transposing pianoforte gone wrong.

The cathedral is very fine internally, but the outside is dull and heavy, notwithstanding the addition of the spire in 1871. The Hôtel de Ville is a small but elegant Gothic building, and the two-storyed Chapel St. Sang is very interesting. There is one thing, however, at Bruges which should on no account be missed, viz., Memling's paintings in the Hospital of St. John. They are wonderful; the groups on the medallions of the Shrine of St. Ursula are said to be his finest work, and these splendid examples of fifteenth century painting are certainly among the most interesting works of Flemish artists. The old hospital (which dates from the twelfth century), apart from itself, contains many noteworthy objects well worth the franc charged for admission.

F. A. BRIDGE.

A NEW COMBINED TONING AND FIXING BATH.

[Translated from the *Camera Obscura*.]

THE combined bath used for toning and fixing collodio-chloride papers generally contains much less gold than that used for gelatino-chloride papers. The difference between the two baths is marked by the presence of alum in the latter under normal conditions, whilst it is absent from the former.

Having observed that a bath containing alum showed less activity in toning collodio-chloride paper than when this ingredient was absent, it occurred to me that the presence of alum in the bath used for gelatine papers might be connected with the difference between the two varieties of papers to which I have referred.

Why should alum be added to the bath? The emulsion is prepared with a considerable quantity of potash alum, much more being used than for dry plates. Nevertheless the latter, even in warm weather, do not suffer much from softening of the film. Moreover, it is unusual to add alum to the fixing bath when prints are toned with an alkaline gold bath.

The presence of a hardening agent seems to be rendered necessary principally through the preparation of the normal bath with sulphocyanide of ammonium, and the occasional addition of salts of lead. Both are solvents of gelatine, if the solutions are concentrated, and they soften the gelatine when used diluted. I tried a bath without either of these additions, and used only half the normal quantity of gold recommended for gelatino-chloride paper. It was composed as follows:—

Water	1 litre.
Hyposulphite of soda	150 grammes.
Chloride of gold	½ gramme.

The toning proceeded slowly, and only to a red-brown, without a bluish tinge. Notwithstanding the hot summer weather, there was no softening of the film.

The addition of sulphocyanide of ammonium was immediately followed by increased activity of the bath, and the tone was bluer. At the same time the film suffered.

I have recently found that thiosinamine is more favourable in its action upon the toning bath than sulphocyanide of ammonium, and, likewise, has less influence upon the gelatine. If 5 to 10 per cent. of a saturated aqueous solution of thiosinamine is added to the toning bath mentioned above, it will be found to work well. If the weather

is not too warm, it will be found unnecessary to add any alum, but in the height of summer it is desirable. The fact that the prints scarcely turn yellow, and begin to tone as soon as immersed in the bath, shows that it is much more energetic than the solution to which no thiosinamine has been added. For the same reason thiosinamine may be used instead of sulphocyanide of ammonium in the ordinary gold bath.

It is a matter of interest that a bath may be prepared with hyposulphite of soda and thiosinamine which will tone without any gold. It is only necessary to add a little alkali, as, for instance, carbonate of soda. Although I most emphatically condemn the use of such a bath, I will give a few particulars concerning it. (Notwithstanding all the warnings that are given, so many combined baths poor in gold, and perhaps even destitute of it, are used, that very little harm can be done by giving information concerning another.) It is well known that thiosinamine, in combination with salts of silver, forms soluble double salts. If these solutions are made alkaline, sulphide of silver is formed. The reaction between the silver nitrate of the image and the alkaline thiosinamine is retarded by addition of hyposulphite of soda. By due adjustment of the three components a bath that will act well may be made. Under such conditions the thiosinamine will, of course, be deprived of its natural function as a fixing agent. Compared with an acid hypo bath, such a solution has the advantage of not destroying the half-tones.

Other experiments, for the purpose of obviating the disadvantages of alum in toning, were unsuccessful. Sulphocyanide of aluminium and formaldehyde caused a heavy deposition of sulphur in the fixing bath through acid reaction, and were consequently no better. The addition of 10 grammes of tannin to the first-mentioned bath rendered the solution turbid (but without depositing sulphur). Upon warming the bath to study its action more closely, the film became rather puffed. The outer skin of the gelatine film, which is of a certain thickness, was already tanned, but the underlying portion of the film was still quite unaffected. What I had thought possible for various reasons had taken place. The tanning agent had diffused in the gelatine more slowly than water, or the solutions of those salts, which have a softening action, probably because the combination of tannin and gelatine had formed a membrane very impervious to the tannin.

I have frequently observed that a saturated aqueous solution of citrate of potash has a precipitating action upon a 10 per cent. solution of gelatine, but my anticipations were not realised that this salt might have similar properties to alum for hardening a gelatine film. On the other hand, like thiosinamine, its influence is favourable to toning. Whilst a print was still red after immersion for twenty minutes in a bath composed of

Water	1 litre,
Hyposulphite of soda	120 grammes,
Chloride of gold	$\frac{1}{2}$ gramme,

after ten minutes' immersion in a similar bath, to which 200 c. c. of a 50 per cent. solution of citrate of potash had been added, the tone had reached a deep black.

R. E. LIESEGANG.

SOME THOUGHTS ON PHOTOGRAPHY.

[Abstract of paper read at the November Meeting of the Photographic Society of Philadelphia.]

PHOTOGRAPHY bears a resemblance to nature in this,—the enormous amount of material thrown broadcast on the world, very little of which is fit or expected to survive. An immense lot of energy and stuff are apparently wasted in order that there may be a very special choice as the evolution of the creature goes on. It has been very easy to make numberless photographs without thought, but what now is required is special skill, endless patience, and more knowledge and study than most of us have been able to obtain. Then, perhaps, a master would be able to make two or three pictures and several portraits in a year which would be worthy to live as works of art. I am speaking very seriously of great works. Sketches and studies are part of the daily exercise of picture-makers, and much material, interesting and profitable to look at, can be shown which need not be mistaken for masterpieces nor shown as such.

We are suffering just now—we always have been—from influences, and, though the influences are better than they used to be, the dis-

position to imitate proclaims that photography still is young. Perhaps in its youth it could not do better than to imitate good things, but I think it could. It could do better by studying them. The painters enjoy some of our "painty" effects, and misunderstand others. They recognise our imitations, but hurt us by identifying our small resemblances with schools of painting, ignoring our identity, calling a strongly-lighted subject a Rembrandt, a hand and glove means Titian, a long, sweeping line indicates Alexander. Prints are classified as Corots or Constables, Whistlers or Holbeins, and we've been feeling flattered—in one sense we should—but it is a false compliment. In spite of all this the individuality of the man is claiming recognition. This is acknowledged on every side. The personality of the photographer is felt in the trivial French character of Puyo's prints, in the strong awkward compositions of the Hoffmeisters, and, above all, the supreme evidence of personality is seen by reflection, for instance, Mr. White's influence so unmistakably stamped on the charming prints by Mr. Edmiston shown in this year's Salon. This personality is not to be worked for; it is the inevitable sign of life, the unconscious expression of the man in his work. We look at pictures on the exhibition wall, a Dyer, a Eugene, or a Steichens, and feel the personality of the man through his special feeling or the shape of his idea, and far from our thoughts is the question whether it is a Voigtländer lens, Seeds 27x plate, platinum, or gum-bichromate print.

Any means that is photographic should be used; the skill of the hand in manipulating plates and prints is not illegitimate. Foreign methods, such as working up in water colour, are destructive of the purity of the art, as the introduction of gems and tinsel into painting and sculpture, and foreign phrases into a piece of English literature, are acknowledgments of unskilfulness or the disinclination to work.

There is an idea about that we see as the lens does. It is a very great mistake; we do not, either mentally or physically. The eye cannot focus on more than one spot. The lens focuses on one entire plane, and with persuasion can be forced to give equal sharpness to everything within its range, from the distant horizon to the near foreground. The difficulty of avoiding this stupid and uninteresting aspect of things is probably the reason why there has been more successful indoor than outdoor work, although that is due partly to the fact that the light, at least, can be concentrated in an enclosure. A feeble admission of this difficulty in mechanical photographs is the usual habit of dragging a figure into a landscape which has no sympathy with it, with the firm conviction that it "introduces life," as they say, into something thus acknowledged to be dead. The only reason the figure introduced draws attention from the general monotony is that it is an intrusion, usually a self-conscious one.

I do not mean to say that the indoor work is better than the outdoor work, that is, pure landscape, but there is more good work in which figures are used. I am compelled to say that the worst things done in photography have been with figures, deliberately planned, posed, and exhibited as "artistic." The deadly self-consciousness of models, the unfitness of objects and clothes used, and the poverty of imagination on the part of the man behind the camera, gives one a sense that one sees a straight photograph of a tableau, a living-picture arrangement, or the misfits of the grand opera choruses with calcium lights. A painter said to his pupils: "Art is an animal not to be caught by detail." The idea is good enough to be remembered by photographic students. Perhaps the commonplaceness of many photographs is mainly due to the absence of any definite intention at the start. We soak our plates and our paper, but we do not soak ourselves enough in our subject. We should follow up a picture, visit it often in many lights and seasons, carrying it about in our memory to its final completion. We may over-expose our plates, but we cannot get too strong a mental impression. It is good practice to sketch with the camera, using no plates, but studying on the ground glass, becoming familiar with the disposition of our lens, so that it may not surprise us, finding out and avoiding what is impossible, while it is impossible, studying how to work the camera to get our point of view, as well as to adjust our eyes to the lens as to new spectacles.

A photographer needs a special training for quickness of perception. It is his advantage to be able to retain by instant exposure of a plate some things which could not or would not enter his mind to conceive, and to do this his judgment and keenness must be constantly under his control. We cannot afford to lose the suggestions of the happenings, which, like the conjunctions of some planets, a man may be able to see only once in his life, and in instances where it is some

line of beauty, or some expression or sentiment, or intense feeling, there is no way of repeating the effect. But the camera can catch it if the man recognises what he wants, and by his memory he can work the material into rare pictures. Such material is, like nuggets of gold, likely to contain much dross because stuff is there which also happens and is not by choice, and the royal right of elimination must be used to dispose of whatever detracts from the value of the thing. Good judgment and a sense of abstract beauty, the realisation of the embodiment of ideas in forms and lines, in light and sound, make that quality called "feeling," which is the personality, the "temperament" of an artist, a painter, photographer, writer, or musician.

EVA LAWRENCE WATSON.

THE ORGANIZATION OF PHOTOGRAPHIC LABOUR.

AFTER the subdivision of labour*, the most important consideration in the economy of production is the organization of the workers, the system upon which they are applied to their various duties, so that each member may fill the position in which his capacities find their fullest scope, and are made most productive. Necessarily this means that to a certain extent each worker becomes a unit, a detail, in a mechanism designed expressly to employ his productive powers to the best advantage, and with the minimum waste. The primary requisite in such a system is the concentration of the workers into as small a space as possible consistent with the demands of the particular activities about which they are occupied. Here we find the reason of the factory, the busy hive, where large numbers of workers are placed within a confined area.

In the early days this concentration was carried to such an extremity that the health of employees suffered through overcrowding, nor was it remedied until governmental action was taken, and various Acts of Parliament to regulate the management of factories were passed. The principle underlying this injurious action on the part of factory owners is right enough, provided due attention is given to the health of the workers. Taking this precaution, concentration can be enforced in all cases with every advantage in aiding successful production.

Examining photographic workshops in the light of this principle, it is found that the majority defy it in every particular. Thus we have operators at the top of a house, retouchers on the second floor, mounters and spotters on the ground floor, and printers in the next street, or several miles distant from the main establishment. Even in the single department of operating it is no unusual thing to find the studio on the housetop, and the dark room in the cellar; or again, the printing done at the end of a long garden, and the toning, mounting, and finishing in the front premises. When assistants are so distributed loss of time and waste of labour power in passing from one department to another must occur, besides delay in handing negatives from operator to retoucher and from retoucher to printer. When workrooms are separated the actual time occupied in going from one to the other may be small, but, even though small, it will amount to a check on the course of work. Practically it comes to paying operator, retoucher, or printer £2 or £3 per week for running up and down stairs and passages, which is too high a wage for labour that is not directly productive. Even supposing a messenger is employed for this service, it still remains unproductive labour, and therefore his wages represent a loss. These few instances may illustrate the importance of concentration of skilled labour as a factor in economic production.

Another advantage arising from the close union of assistants is that the charges upon management are thereby reduced. When various departments are scattered the supervision cannot be so close as when combined, and, especially in large factories, this becomes a matter which makes a difference in the cost of management. Even in a small photographic establishment the principal spends much time merely in making inquiries of, and giving orders to, his employees, and all time thus wasted means that his services are taken from productive to perform unproductive duties that yield no profit.

It follows from this that the arrangement of a photographic house of business is a question worthy of attention, since it may exercise a great influence in determining whether the balance at the year's end is on the right or the wrong side; at the least, it is economically unsound to carry on photographic production in premises where separation of the various branches is compulsory. The workers properly related, the next essential is to direct their energies in the most profitable channels, and to allow no deviation which would tend to disorganise or throw the whole machinery of production out of gear. The first point to insist upon is that the highly skilled and highly paid assistant should be put to labour requiring such skill, and that the less skilled and less paid be allotted and kept to functions in accord with their capacities and rate of pay. To occupy operators, retouchers, or printers, in performing inferior services that might be done by a lower type of mechanic, or by unskilled labour, cannot lead to an economy, but is rather inviting

a financial loss. On the other hand, it is also wasteful to reverse their positions, allowing printers to retouch, retouchers to act in the studio, and operators to exercise the privileges of management. These perversions are contrary to the orderly conduct of business; in the first case it implies a loss to the employer who cannot find sufficient work to fully occupy the time of an operator and retoucher in those duties for which they are trained and paid wages in accordance with the high skill demanded; in the second instance it is not economical to pay employees for services which are inefficient, since by doing so they are overpaid. The principle to bear in mind is that a worker should be allowed to do only that at which he is thoroughly competent, otherwise, whatever his salary, he is overpaid.

Next to knowing what a man can accomplish is the question of how much, that is, of gauging the amount of produce he can be expected to finish daily. Evidently, if a worker does less than his powers are capable of, he is employed at a loss, but it is not so obvious, though none the less true, that when his powers are overstrained he becomes unprofitable as a factor in economic production. It is a common fallacy with employers to believe that the working capacity of a man can be indefinitely increased either by persuasion or compulsion, and thus by bringing sufficient pressure to bear the output of one man can be made equivalent to that of two men. Man to man, perhaps, the working powers vary, though, taking men in the mass, the maximum that can be expected from them is a fairly constant quantity. To give an example: In a photographic printing establishment employing some 30 printers, working under the same conditions, it was found after repeated observation that their capabilities ranged as under:—One printer marked 500, two printers marked 400, 24 printers marked 300, three printers marked 200. From this it is seen that whilst the best printer could produce two-and-a-half times as much as the worst, the larger proportion, 24 out of 30, fell under the same head as regards their powers of production, indicating a limitation of capacity. They were, as a matter of fact, incapable of doing more. Supposing, however, compulsion were tried to compel them to reach the 500 limit, by lengthening hours or by closer supervision, little would result, for it has been proved in other industries that long hours do not mean an increased output. Extra supervision also fails, because, though the output may increase, the gain is outbalanced by the added expense of the overseers. In the end it is better to recognise that the producing power of men in the main is a fixed quantity, and that it is essential in the economic organization of labour to estimate this average capacity, to apportion the work, paying wages in accordance.

Another requisite in the profitable employment of labour is a regular and systematic method of working; this demands stability of management, leading to steadiness of occupation, and uniformity of output. Instability of management reacts on the employee, weakens his power, and reduces his efficiency. Owing to the numerous processes now used in the photographic trade, a breaking of the continuity of production has become quite customary; an operator, for example, being changed almost hourly from enlarging to outdoor operating, then to studio work, and again to making gelatino-bromide prints. With such breaks as this implies the productivity of a worker must be curtailed, and the value of his services much less than if the whole day were spent in pursuing a single object, the effect on a business being that wages are made a greater charge on cost of production, and, consequently, profits are lower.

Steadiness of purpose, though at variance with the notion of a servant, is a powerful aid towards the successful conduct of employees. It is a wrong policy to be continually altering the course of work, methods of manipulation, or rearranging meal times and hours of working. Many employers also contract the habit of taking a worker from an unfinished task to commence another, repeating this again and again until at the day's end nothing marketable has been produced. With a sound economy, continuous effort until a given task is completed should be the rule in place of the indecision and febleness characteristic of the management of many photographic houses.

An action that destroys systematic procedure is frequent experimenting with the numerous plates, papers, &c., now manufactured. Photographic labour is an expensive commodity, and when added we have the cost of plates, &c., used in the experiments. It is evident that some solid advantage should be in view, or otherwise a serious loss in wages and material must be met. In all cases the photographer needs to distinguish between what is experimental and what is productive work. To facilitate the organization of assistants the employer should have every confidence in them, that is to say, their work allotted to them they should be left to execute it: if workmen cannot be so left, then production will never be profitable, because the cost of excessive supervision, as with slave labour, outbalances what profit is made on their labour.

At the present time the employer undertakes the sole responsibility of the organization of labour; as manufacture increases in complexity it will be thrown largely on the workmen themselves. In a trade union this is admitted, and one of its duties is to classify and fix the capacity and functions of its members. Assuming that trade unionism became general, the productive power of the nation would increase, since the employer must find it more economical to deal with employees already organized than to perform the task himself.

JOHN A. RANDALL

* See THE BRITISH JOURNAL OF PHOTOGRAPHY, Sept. 28, 1900, p. 168.

THE "POLYSCOPE."

THE polyscope is the invention just patented of Mr. Baskett, one of the members of the West Surrey Photographic Society, and shown by him in the last demonstration at the Society's rooms, Railway Hotel, Battersea Rise. It is a much-improved and developed kaleidoscope, dear to our childhood, but now capable more than ever of rendering symmetrical designs from all kinds of irregular foundations, with the addition that, by raising the mirrors parallel, continuous repeats of any original pattern are obtained. As in the kaleidoscope, the changes seem endless, with the great difference that once the pattern is determined it can be photographed from the viewing end of the apparatus, and a permanent record secured—which, if desired, may be made the start of a fresh series of patterns. Mr. Baskett showed, by means of a few sprigs of ragwort, a bootlace, random scribbling, a bent wire, a piece of printed pattern, &c., the wonderful variety of effects obtainable—squares, octagons, polygons, fan shapes, cylinders, friezes, belts—all being given by the polyscope in rapid succession, altered by every change in the object used, or of its position or change in the angles of the mirror. Simple lines entangled were followed by combinations of bewildering mixture, beautiful, fantastic, and as fascinating to watch as a conjuring trick. Even humour had a place, for by means of some Dutch faces in the library copy of the "Studio" Mr. Baskett produced a series of grotesques—two faces that quietly merged in one, with separate eyes, but a common nose—or, rather an uncommon one—for roars of laughter greeted its appearance, or, again, the faces combined, and created a new face altogether, and then dwindled away to wooden-looking knobs much like the pawns of chess. The mode of photographing having been shown, and an exposure made, Mr. Wilshere, the Hon. Secretary, next passed through the lantern a series of slides prepared from polyscope photographs—mostly lovely lace patterns—derived from an original piece about an inch square. Beautiful lamp-shade designs from parts of an ornamental letter in a book were succeeded in intricate devices from a photograph on which a fly had accidentally settled in the polyscope. The evening ended with two votes of thanks to Mr. Baskett, one for the demonstration, and a second one for the gift to the Society, which the Secretary announced, of the polyscope used that evening.

PERMANGANATE OF POTASH AS A REDUCER.

[Received too late for the ALMANAC.]

I HAVE found permanganate of potash a first-class reducer for negatives that (1) require general reduction, and (2) those in which the contrasts are too harsh. In fact, with the exception of the case of veiled shadows in which ferricyanide of potash is to be preferred, I consider the permanganate is the best reducer available. I find in practice that its action varies according to degree of dilution, and, secondly, according as the negative be wet or dry on applying the reducer. A wet negative to which a dilute solution is applied is evenly reduced all over; the same solution applied to a dry negative gives a slight excess of action on the denser deposits. By rapidly immersing and removing a dry negative, with instant washing, the action is confined absolutely to the high lights, and this action is proportionate, within limits, to the strength of the reducing solution. To treat a negative that is very much too harsh, it is better to use a solution of medium strength, and to do the needful in stages, i.e., washing and drying the negative after one flowing, and then treating the dry negative again till sufficiently reduced. If a negative is treated a second time with the permanganate before drying, the action will not be confined to the high lights, but be more general. H. HANDS.

LUMIERE'S CERIUM REDUCER.

[Patent No. 470 of 1900.]

MESSRS. Lumière remark that the reducing agents of photographic images obtained by silver salts hitherto employed to reduce over-exposed and over-developed negatives were primarily formed of two solutions, such as the perchloride of iron and the hyposulphite of soda, into which the image to be reduced was immersed successively, after preliminary washing, to obviate the formation of a precipitate.

The inconvenience resulting from the necessity of immersing the image successively in two baths has brought about the employment of substances, such as the ferrocyanide of potassium and the hyposulphite of soda, acting in a manner analogous to the perchloride of iron and the hyposulphite of soda, but capable of being mixed without producing a precipitate.

The reducing agents, formed of a mixture of peroxygenised salt and hyposulphite of soda, could not be preserved in aqueous solution with-

out the two salts reacting somewhat rapidly on each other, and at the end of a short time the reducing agent was not usable.

Further, the mixture of ferrocyanide and hyposulphite of soda, which is the reducing agent ordinarily employed, frequently acts in an irregular manner if the precaution is not taken of eliminating the excess of reactive by immersing the image in water before examining it by transparency to ascertain the progress of the operation.

The patentees have observed that certain peroxygenised salts alone, without the addition of hyposulphite of soda, can be utilised as reducers, provided the acids of these salts give a silver salt sufficiently soluble in water.

With the ferric salts, this property, although fulfilled by the sulphate, the nitrate, the lactate, &c., is not practically utilisable, as the washing in water colours the film yellow, probably because of the formation of a basic salt. The communicators have well succeeded in avoiding this inconvenience in a manner practically complete by the addition to the ferric salt of a considerable quantity of an organic acid, or even of an alkaline salt obtained by an organic acid, but another inconvenience which the employment of ferric salts presents is that, whilst reducing the image, it modifies its colour, which becomes more yellow.

Messrs. Lumière have found that the aqueous solutions of salts of peroxide of cerium, and more particularly the sulphate of cerium, have the property of very regularly reducing images produced with silver salts, either on glass or on paper, without producing any of the inconveniences of the ferric salts.

Their great solubility enables concentrated solutions of them to be made which do not affect the gelatine at all, and they are diluted with water as necessary at the moment when they are required.

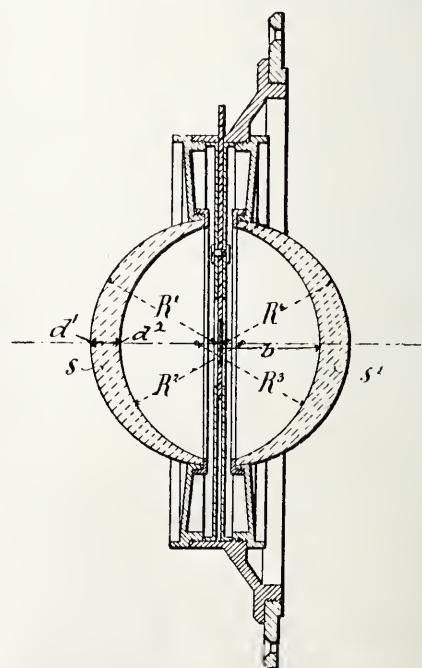
In order to prevent these solutions being separated by a large excess of water, there is added to a 10 per cent. solution, for example, which may be considered as the normal concentrated solution, a few cubic centimetres of concentrated sulphuric acid.

The solutions thus prepared are very stable, do not affect the gelatine, and remain in solution even in the light. To reduce negatives the 10 per cent. solution is diluted as required. For paper a much more diluted solution is employed, for example, a 1 per cent. solution. The communicators have discovered that other peroxide salts, such as those of titanium, have analogous properties, but less useful than those of cerium.

GOERZ'S IMPROVEMENTS IN ASTIGMATICALLY CORRECTED LENSES FOR PHOTOGRAPHY.

[Patent No. 14,487 of 1900.]

THE object of the present invention is a photographic lens astigmatically corrected for taking photographs under as wide a picture-angle as possible. The correction of spherical and chromatic aberration



being neglected, it is possible to produce an even picture of almost unlimited dimensions free from stigmatism of the oblique pencils.

The new lens belongs to the class of spherical lenses. All the constructions of these lenses hitherto known show great deviations from an anastigmatic correctness and are only useful for picture-angles of at most 90°. Even if the lens frames or openings of the object-

glasses were to allow of rays passing under an inclination angle greater than 45° to the optical axis, astigmatical curves will show that a sharp image cannot be the result owing to the rapid increase of astigmatic aberration.

Through investigations given in the treatise by E. v. Hoegh in *Archiv fur Wissenschaftliche Photographie* (Archive of Scientific Photography), vol. ii., part 4, Halle a.d.S. 1900, p. 86, it has been proved that astigmatic correction of the picture field or narrow pencils for any given direction of the rays can be produced in the simple meniscus. In a lens of 6.09 mm. thickness it was, for instance, found that at an inclination of the pencil to the optical axis of about 30° a strictly anastigmatic correction was produced, but that for all other rays (except those at an angle of 0° to the axis) astigmatism remained, which attains a certain allowable maximum between the axis and corrected rays, but continually increases beyond the latter.

Thus with a view angle of 60° astigmatic errors will occur which are so large that the sharpness of the picture will be insufficient.

If, however, astigmatic correction has to be done for a larger view angle, such as 90° , the maximum of astigmatic difference between the optical axis and the corrected principal rays will surpass the measure allowed for the non-sharpness and produce a useless picture. These so-called intermediate errors form consequently determinate limits to the extension of the useful picture-field.

By means of calculation the applicant has found that the intermediate errors have a certain connection with the thickness of the glass meniscus employed, and that they become less in proportion to the diminished thickness of the glass. The result of this observation is the present improved construction of lens.

The annexed drawing represents a form of construction of the improved lens in section through the axis.

The lens is composed of two cup-shaped meniscuses s and s' arranged symmetrically having their concave sides towards each other. The convex and concave surfaces of the meniscuses have approximately the same radius of curvature and the thicknesses of the glass are very trifling.

For instance, for a lens with a focal distance of 100 mm. the following constants may be employed :

Radius of curvature of the convex surfaces : =

$$R^1 = R^4 = 8.47132 \text{ mm.}$$

Radius of curvature of the concave surfaces =

$$R^2 = R^3 = 8.51034 \text{ mm.}$$

Greatest thickness of the glass of the lenses =

$$d^1 d^2 = 2.206 \text{ mm.}$$

Half distance between the concave lens surfaces =

$$b^1 = 6.7961.$$

Index of diffraction of the glass used for the lens in relation to the line G^1 of the spectrum =

$$n G^1 = 1.52053.$$

Calculation shows such small results for the intermediate errors owing to the trifling thickness of the glass that a decrease of sharpness is unnoticeable with a view angle of 135° . The principal rays leaving under an inclination to the axis of 53° will show astigmatic corrections, whilst the astigmatic error at the place of its maximum between the centre and the edge amounts only to 0.133 mm. and consequently can be quite neglected. The astigmatic difference of the rays leaving under an inclination angle to the axis of 72° which angle is now practically useless will likewise only amount to 0.641 mm.

Further, it results from calculation that the amount of the index from diffraction of the glass material used for the meniscuses has no great effect on the nature of the picture, in consequence of which glass as pure as possible and of as small a colour-destroying capacity as possible should be chosen, since with the trifling thickness of the glass achromatising is not feasible.

Studio Gossip.

At the Royal Aquarium, Westminster, the second Gas and Allied Trades and International Acetylene Exhibition will be held from Friday, December 21, 1900, till Tuesday, January 22, 1901. A great feature will be the acetylene section, where it is proposed to demonstrate the strides this new illuminant has made during the past twelve months. Gold, silver, and bronze medals, and diplomas will be given for the most efficient apparatus for the manufacture and distribution of acetylene gas. The Exhibition will be principally devoted to the showing of all kinds of apparatus for the generation, storage, purifying, measuring, and distribution of gas; all kinds of apparatus used in cookery and heating by gas; gas traction and power, including the latest types of gas engines; apparatus for showing the different systems of gas lighting, including compressors, mantles, burners, and art metal fittings; apparatus for showing the adaptability of acetylene for railway lighting, burners, fittings, &c. In the acetylene section it is proposed that a committee shall test the working of the various apparatus during the Exhibition, and award gold, silver, and bronze medals for the most efficient apparatus.

WINTER Precautions.—We are now within a few days of Christmas, but, up to the present, we have had, with one slight exception, no indication of winter—the weather has been quite springlike. In this fickle climate of ours there is no telling when winter—and a good, old-fashioned "one, too—may be upon us. Are we all prepared for one if it does come? Is our water supply, for example, securely protected against frost? Few of us but know the inconveniences we suffered a few years ago during weeks through our water supply being frozen and photographic printing being practically stopped for want of water for washing the pictures, burst pipes, &c. Most, when the pipes were frozen, realised how easily the trouble in most instances might have been avoided had a few timely precautions in securing the pipes both within and without the house been taken against frost reaching them. The trouble involved in protecting the pipes is but slight, even if events should prove that it was unnecessary. When once the pipes get frozen there is very little prospect of them getting thawed again till the weather changes, and that may not be for weeks, as was the case in the year to which we have just referred. An old proverb says, "A stitch in time," &c., and this may well be borne in mind by photographers at this season with regard to their water supply.

PORTRAITS with Winter Surroundings.—It may seem a little anomalous to direct attention to the subject of portraits taken under wintry aspects when there is no immediate prospect of our having any actual winter. In some countries where the winter is severe and lasts long, as in America, Canada, Russia, and elsewhere, a special feature is made by professional photographers of portraits taken with winter surroundings, and a considerable business is done in them. Why should this not be done here if we have a long spell of cold weather and some snow? At present, while the weather is so mild, it is true, there would not be a demand for them, but the case would be different if we happen to get some "real" winter later on, and portraitists were ready with specimens to show at once; but they should be taken beforehand, and so as to be ready to exhibit. Furs and winter clothing generally are very effective in portraits, but they are still more so when the surroundings are in unison with them, such as snow-clad accessories and backgrounds. We have on more than one occasion in back volumes indicated how they can easily be extemporised without delay, except for a little trouble with what is to be found in almost every studio. Why we call attention to the subject here is to remind our friends that there is a possible way of bringing some little extra "grist to the mill" during the dull winter months, which many quite overlook in this country.

THERE exists a microbe which, when properly fed, will grow and multiply enormously, emitting during its development a strange phosphorescent light. In the past we have been wont to look upon phosphorescence as a phenomenon due essentially to the presence of phosphorus somewhere. We now know that this is a mistake, says "The Lancet," for phosphorescence occurs in a very great number of instances in the entire absence of phosphorus. Phosphorescence is undoubtedly a manifestation of chemical or physical change, but the change, of course, may not always be due to the working of countless microscopic organisms. It certainly is in the case of the phosphorescence of the sea. In this case the phosphorescence is best when the sea is disturbed, and the maximum of light is emitted from the crest of a short, rapid wave or in the foam produced by some disturbance. This is due to the fact that the phosphorescent bacteria or photo-bacteria are much more active in the presence of an excess of oxygen. Indeed, the respiratory exchange or oxidation of the bacteria is the cause of sea phosphorescence, since if the micro-organisms be killed or oxygen be excluded the light is quenched at once, while on adding an abundant supply of combustible food-stuff, such as sugar, the light is intensified. The glow of ordinary yellow phosphorus is, of course, due to direct oxidation without the agency of micro-organisms. The peculiar greenish glow seen upon stale haddock and other sea fishes is produced by this remarkable photo-bacterium, and is in no way connected with the presence of phosphorus. It is possible to cultivate the phosphorescent bacteria so as to obtain a fluid which is very strongly phosphorescent. Thus by placing the flesh of fresh haddocks or herrings in a two to three per cent. solution of common salt and keeping at a low temperature—about seven degrees above freezing—it will be found that after a few days not merely the fishes, but also the whole of the liquid in which they are immersed, give off a pale greenish light which becomes much more brilliant if a little sugar be added. Pure cultures may thus be obtained exhibiting such a strongly phosphorescent light that by protracted exposure they may be photographed by their own light.

News and Notes.

THE Madras Amateur Photographic Society ceases to exist on December 31.

We are sorry to have to announce the death of Mr. G. Higginson, photographer, Bowdon, Cheshire, which took place on Sunday, December 16. He was much respected in the photographic profession.

THE Borough Polytechnic Photographic Society's Sixth Annual Exhibition of Photographs and Lantern Slides will be held at the Borough Polytechnic Institute, 103, Borough-road, S.E., on Thursday, Friday, and Saturday, December 27, 28, and 29, 1900, from seven to 10.30 p.m. on Thursday, and six to 10.30 p.m. on Friday and Saturday. There will also be large displays of photographic apparatus accessories by the trade, popular lantern entertainments, war pictures by the animatograph, special

exhibit of natural colour photographs, X rays, chromoscopes, wireless telegraphy, photography popularised by short practical demonstrations. Admission will be free.

THE Exhibition of Modern Illustration.—The Board of Education has decided to open this Exhibition on Monday, January 7 next, in the galleries of the Indian Section of the Victoria and Albert Museum, South Kensington. A private view will be held on Saturday, January 5.

THE New Physical Laboratory.—It is now notified that the Queen has granted to the Royal Society Bushey House, Bushey Park, which was formerly occupied by the Duc de Némours, for the purposes of a National Physical Laboratory. It will be remembered that some months ago the good people of Richmond, or a certain section of them, were up in arms when it was proposed to have the National Physical Laboratory in the old Deer Park, while others were much in favour of that location. We had some comments on the affair at the time. We wonder if the inhabitants of Twickenham and Hampton will raise a similar objection to the presence of the Laboratory in their district that the Richmond people did? We should imagine not, but that they would be only too pleased to welcome its presence.

THE Thornton Heath Polytechnic Photographic Society announces a Photographic Competition, open to members only, in which two silver and four bronze medals are offered for competition. The following are the classes:—Hand-camera work (direct prints only, from negatives taken with the camera in the hand): One silver medal, presented by Mr. F. O. Bynoe, Vice-President, and one bronze medal, presented by the Society. Landscape, seascape, and river scenery: One bronze medal. Any other subject: One bronze medal. Lantern slides (sets of four): One bronze medal. The award will be made to the best individual slide. A silver medal, presented by the President, will be awarded to the best picture entered for competition. The pictures in the competition will be exhibited at a conversazione, to be held at the Public Hall, Thornton Heath, on Saturday, February 9, 1901. Mr. R. Child Bayley, F.R.P.S., will act as judge.

EXHIBITION of Kodak Pictures of the Transvaal War.—At the new branch premises of Kodak, Ltd., at 59, Brompton-road, London, S.W., Knightsbridge, near top of Sloane-street), a collection of 180 enlargements of Kodak records of the South African war is now on view. The pictures have been taken by Mr. H. C. Shelley (War Correspondent of "The King" and "The Westminster Gazette"), Captain Archibald, U.S.A., Major F. A. B. Daly, R.A.M.C., Lieutenant and Adjutant T. Matheson (1st Battalion Coldstream Guards), Lady Sarah Wilson, Mr. Dan Albion, Captain F. J. Bowker (2nd Battalion Hampshire Regiment), Lieutenant J. C. Halahan (1st Battalion Royal Dublin Fusiliers), Major Hill (2nd Battalion Royal Irish Fusiliers), Mr. W. D. M. Cotts, Mr. R. Dunsmore, Captain E. Radcliffe (2nd Battalion Devon Regiment), Mr. W. Pott, Lieutenant Claude A. Lafone (2nd Battalion Devon Regiment), Sapper H. Stormer, T.D., R.E., Miss M. C. Fair, Mr. H. C. Causton.

Marks on Porcelain and Pottery.—At a meeting of the Auctioneers' Institute of the United Kingdom, held last week, a paper was read on "Marks on Pottery and Porcelain." It is, we believe, a recognised fact that auctioneers, dealers, and connoisseurs are frequently deceived by fraudulent marks on both pottery and porcelain. The lecture, we read, was illustrated by drawings of the chief marks known. It occurs to us that the illustrations would have been still more satisfactory and reliable had they been photographs instead of hand drawings, and possibly the better recognised by connoisseurs. Marks on porcelain, like the labels on violins, are frequently imitated with fraudulent intent, and purchasers are often deceived, and so sometimes are honest dealers. But if there were a complete collection of photographs of the genuine old makes available it would alike be some protection to dealers and to the public generally, much more than would be one of hand drawings. Some such protection is desirable when the prices that old porcelain realise are considered. For example, during the lecture it was mentioned that there was a dessert service of old Sèvres at Windsor Castle that was valued at £100,000.

At the last meeting of the Roentgen Society, Dr. Mackenzie Davidson gave some demonstrations with his stereoscopic fluoroscope, on which shadows cast by the Roentgen rays are shown upon the fluorescent screen in three dimensions, instead of, as is usually the case, in only two. Since this fluoroscope was exhibited at the Royal Society's soirée in June last improvements have been introduced into the motor mercury break (which can be used with any coil), and also in the eyepiece through which the operator looks at the shadows on the screen. This break is arranged to work any current from 12 up to 100 volts, and by its use the brilliancy of the image on the screen is greatly increased, and the flickering is done away with. As is well known, two tubes are sparkling alternately, and the automatic eyepiece, which consists of a shutter moving backwards and forwards over an opening, allows the image from the first tube to be seen by one eye, and immediately after the image from the second tube is presented to the other eye. The movement of the shutter synchronises with the sparking, and is sufficiently rapid to make the image stereoscopic, with the result that the location of a foreign body, or the diagnosis of injury or disease, is immensely simplified. By the use of the Mackenzie Davidson break the time of exposure is also greatly lessened if high voltages are used.

STOLEN Relics.—The theft of the Nelson relics from the Painted Hall, Greenwich, is now exciting great surprise, not to say indignation. This is not the only theft there has been from museums of late, for it now comes out that some objects which were lent by the Science and Art Department to the borough of West Ham were missed more than a month ago. Some months back several valuable articles were stolen from the Victoria and Albert Museum, South Kensington, and we now

learn, by a Reuter's telegram, that a similar robbery to that from Greenwich has been effected from Toulon Museum, when some historically interesting relics of the late Admiral Baudin were stolen. It is difficult to imagine where thieves can dispose of these relics. One would think they would be white elephants on the hands of the thieves, for they could not be offered for sale, as, being what they are, they can only be marketable for the precious metal they contain. One would surmise, however, if all the relics and other articles of interest in our National museums were photographed, and a photographic record of them kept, it might at times lead to the detection of the culprits if they offered them for sale. At Windsor Castle, for example, all the pictures have been photographed and the negatives kept systematically, also any new ones acquired are immediately photographed and added to the other copies. By this arrangement, in the case of theft, copies could at once be circulated with every prospect that the thief would soon be found out. Why should not a similar practice be followed with the priceless objects in our museums?

Commercial & Legal Intelligence

The Directors of Kodak, Ltd., have declared a dividend of 1½ per cent. on the Preference issue, making 6 per cent. for the year ending December 31, 1900, and an interim dividend of 2½ per cent. on the Ordinary shares, which dividends will be payable on or after the 31st inst. They have further resolved that the transfer books be closed till the 31st inst.

MESSRS. THOM AND WIGGINS, of 15 and 16, Giltspur-street, London, E.C., write: "We have been appointed the sole representatives of Messrs. Trapp and Münch, Berlin, the well-known manufacturers of pure photographic mounts, &c., and have established ourselves at the above address under the style of Thom and Wiggins. We shall also supply all articles appertaining to the photographic trade, viz.: Cameras, lenses, shutters, plates, papers, blottings, backgrounds," &c.

RE EDGAR ALBERT WILLIS, of 20, St. John's-road, Scarborough, and Alfred Alexander Willis, of 1, Stepney-avenue, Scarborough, carrying on business as E. A. and A. A. Willis, landscape photographers, at 31, London-road, Scarborough.—The first meeting of the creditors interested under this failure took place at the offices of the Official Receiver, Scarborough, on Friday last. The statement of affairs filed by the debtors disclosed gross liabilities amounting to £320 16s. 1d., of which £308 6s. 1d. was expected to rank against the estate for dividend. The deficiency, after allowing for the claims of preferential creditors payable in full, was returned at £126 12s. 5d.

THE AUSTIN-EDWARDS MONTHLY COMPETITIONS.—The following is the list of awards in the Lantern-slide and Film-negative Competitions for the current month: Lantern-slide Competition: £3 cash prize, F. W. Gregg, Brixton, S. W., "Norman Arches, Peterborough"; £2 cash prize, F. J. Mortimer, Portsea, "Watching the tide rise"; £1 cash prize, H. Holt, West Kirby, "Bishop Reginald's Gateway, Evesham"; £1 cash prize, Miss G. F. M. Hopkins, Oxford, "A Greengrocer's Shop, Laigueglia"; £1 cash prize, W. Riley, Coventry, "Trekking Home"; £1 cash prize, R. R. Rawkins, Canonbury, N., "A Canal Lock"; £1 cash prize, H. G. Brierley, Huddersfield, "In the Kasbab, Tangier." Film Negative Competition: The Frena Camera given each month for the best negative on an Austin-Edwards Film has been secured by J. H. Williams, Worcester, for his negative, "Interior of a Conservatory."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
27-29	Borough Polytechnic	Sixth Annual Exhibition. Demonstration: Thornton Films. Walter
27.....	Oldham	{ D. Welford.
28.....	Croydon Microscopical	Conversational Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 18.—Technical Meeting.—Mr. Thomas Bedding, F.R.P.S., in the chair.

PHOTOGRAPHY IN WARFARE.

Mr. H. C. Shelley, who had been announced to read a paper on the subject, "Photography in Warfare," explained that he had had no time to prepare a special paper, but was delighted to have the opportunity of delivering before the Society the lecture which he was now giving throughout the country on the war in South Africa, and illustrating it with slides from some of the photographs taken by himself in the course of the campaign as War Artist of "The King." He proposed to tell the story of his personal experiences, and the pictures, whatever their merits or demerits as photographs, were, at any rate, truthful representations of the scenes and incidents which they purported to depict, and not sketches made in a comfortable studio in St. John's Wood under the

inspiration of liquid and nicotian refreshment. At noon, on October 12 last year, Mr. Shelley received instructions to start for Cape Town, and, as he had to leave England two days later, he had very little time in which to get together any special photographic outfit. No particulars were given as to the apparatus which he took with him, but we are able to state that it included a half-plate stand camera with tele-photo, R.R. and W.A. lenses, and a Thornton-Pickard shutter, quarter-plate and half-plate Shew Cameras, two Kodaks with rolled films, and a 5×4 cartridge Kodak, which he bought at Cape Town. We believe that most of the slides exhibited were from negatives taken with the last-mentioned instrument, it having been found impossible to carry a glass-plate camera about a battlefield. He, however, took a supply of plates from England, and used a large number of them on suitable occasions. Many negatives were developed during a halt of two months at the Modder River. "Modder" means "mud," of which Modder River water chiefly consists, and it is surprising that such excellent results could have been obtained with a developer of which this commodity formed a considerable proportion. The tele-photo lens could not be employed at a greater distance than about half a mile, as the heat haze was so intense as to hopelessly blur the picture. Leaving Southampton by the "Dunottar Castle," Mr. Shelley had as a fellow-passenger Sir Redvers Buller, and succeeded in getting a very good snapshot of him, in spite of his strong antipathy to the camera. After staying at Natal for a fortnight, the lecturer decided to follow the fortunes of the force which had started for the relief of Kimberley, and travelled by rail to De Aar. The railway journey was illustrated by some views of the dismally monotonous veldt, and reference was made to the very large number of men who were required for the purpose of guarding the lines of communication, which extended over about a thousand miles. So many had to be allocated to this essential duty that, out of the 200,000 men who were sent out, probably not more than 70,000 were available for active service in the field. On reaching Lord Methuen's base at Orange River, Mr. Shelley and other correspondents were told they could not be allowed to go further. The relief force had started for Kimberley with a certain number of press-men, and they must not even go beyond the bounds of camp without permission. After some days the lecturer got out of this difficulty by securing a pass to Hopetown "and back," but the return halves of that pass are still in his possession, for from Hopetown he started off across the veldt to try to overtake Lord Methuen. The battle of Belmont took place at this time, and some pictures of the hospital trains arriving with parties of wounded gave Mr. Shelley an opportunity of stating his experiences of the work of the ambulance department. He was on several battlefields with the Royal Army Medical Corps, and he expressed the emphatic opinion that, considering the facts that the operations were conducted at a distance of a thousand miles from the base and in the heart of the enemy's country, and that the army had gone to South Africa, not for a picnic, but for war, the hospital arrangements and the service of the R.A.M.C. were magnificent. No other word would adequately describe them. Having overtaken Lord Methuen's force, the lecturer accompanied it to Kimberley, and afterwards proceeded to Bloemfontein. The photographs exhibited were throughout excellent, technically and pictorially, and showed no evidences of the very difficult and dangerous circumstances under which most of them were taken. They included many views of camp life and typical bits of scenery, pictures of the Boer trenches, groups of prisoners, incidents of the battles of Magersfontein and Modder River, and, in fact, everything that was necessary to bring before the audience in a most striking and vivid manner the realities of the campaign. Photographically, one of the most interesting slides represented a banquet given at Bloemfontein by Lord Roberts to the foreign attachés who accompanied him: it was from a negative taken by the aid of a flashlight apparatus extemporised by the lecturer, who ransacked the town in order to obtain the necessary materials. Mr. Shelley is a capital lecturer, and told some good stories, sometimes with a touch of dry humour which was much enjoyed by his audience, and with simple and eloquent pathos when relating some of the tragic incidents which are inseparable from such a subject. The applause with which he was frequently rewarded reached its climax when a most cordial vote of thanks was tendered to him.

COMING EVENTS.

On January 2 Mr. Frank Sutcliffe will open an exhibition of his photographs and will give an address. At the Ordinary Meeting on January 8 Mr. C. H. Bothamley, F.I.C., F.C.S., will read a paper on "Some New Methods of Intensification and Reduction."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 13.—Mr. T. K. Grant in the chair.

Mr. J. E. Hodd gave a demonstration of the "Development of Printing-out Paper." This process, he said, was looked upon and taken up by the average amateur photographer with a great deal more trepidation and fear than the real difficulties warranted. Wilson's process he had worked very successfully, but the process he now used presented no difficulties whatever. The formula used was that adopted by the Kodak Company for solio paper, but modifications could be easily contrived. At this stage a series of prints produced from partially-printed impressions and finished by development was passed round. Different makes of paper had been employed so as to make it clear that it was not difficult to successfully deal with several of the papers on the market. It was mentioned that most of the matt prints were on the new Carbona paper, a paper that developed very well. Mr. Hodd wished to impress upon

the meeting that with any given negative the prints resulting by development were, as a rule, far better than those produced completely by printing out. Prints were passed round showing the tone of the paper given by development; they were neither toned nor fixed. The negatives in many cases accompanied the prints. It was advisable to carry the initial printing out to the stage when all detail was well out, but to nothing like the stage required for toning and fixing in the usual way. The printing should be followed as soon as practicable by the development, long delay not being conducive to excellence of result. As giving an idea of the depth of printing required, he passed round a couple of prints, both of which had been printed that morning in twenty minutes, before 8.30 o'clock, when the light was certainly not powerful. The developer used was composed of

Quinol	12 grains.
Citric acid	30 grains.
Sodium acetate	6 drachms.
Water	15 ounces.

Air bells must be carefully avoided in flooding the paper with the developer. Development should be followed by ten minutes' thorough washing, and then toning can be effected. Mr. Hodd used a bicarbonate bath. The whole of the operations were clearly described and shown, and the prints made during the evening were passed round. Mr. Hodd said that fresh paper should be always used. If printing were carried to a stage short of that prescribed, the result would tend to hardness but if well printed a nice, pleasing softness is obtained.

PHOTOGRAPHIC CLUB.

DECEMBER 12.—Mr. F. A. Bridge in the chair.

Mr. H. Snowden Ward passed round some selected examples of recent additions to the collection in the hands of the National Photographic Survey. The work by Mr. A. R. Hogg, depicting the inside and outside of Dowth Mound, in Ireland, was excellent; and Mr. R. W. Dugdale's contributions were likewise of a meritorious and valuable character. Amongst the batch of prints about to be deposited at the British Museum was a series of prints from an old collection of negatives taken in Highgate. Many of the subjects have vanished or changed, so that this find is an interesting one. There are now in the British Museum 1550 subjects, and they may be seen in the Print Room, where they are stored in the order of counties.

Sir J. Benjamin Stone, M.P., who was present, spoke of the great progress being made by the Survey, the interest in it being distributed throughout the whole of this country and Scotland and Ireland. He believed that the many references to its work by public men, who he was pleased to see had grasped the importance of the movement, was something to be proud of. The Association was firmly established, and its influence was spreading. He considered that many of the photographic societies in small provincial districts could add interest to their work and strength to their position if they took up the Survey scheme. As a stimulant to activity he could safely recommend this course.

Mr. F. H. Evans, whose reputation and skill as a photographer, specially of cathedrals and churches, is well known, gave a pleasing chat and exhibition of pictures taken at Ely, Wells, and some of the French cathedrals. One of the earliest pictures was a unique view of the Octagon at Ely, the whole of which had been cleared of its benches specially at his desire. Mr. Evans had with him several views of this portion of the edifice, giving glimpses between pillars and through arches, all of which were much admired. There were several pictures taken at Middelburg, in Holland, recommended by Mr. Evans as a delightful spot for a week-end holiday, amongst them two of the Rathaus. The French cathedrals represented were those of Amiens, Chartres, and Bourges, the last of which afforded Mr. Evans particular enjoyment. Altogether, the slides proved a source of much pleasure to the meeting, and as creditable to Mr. Evans as his former work.

Mr. Harold Baker confessed a preference for the simplicity, dignity, and strength of the English cathedral structures to the more florid and gorgous, though beautiful, French buildings.

Sir Benjamin Stone remarked that the impressions that these pictures created in his mind were, to his thinking, more important than the actual pictures. The photographs wanted life—they wanted the story of the creation of the great buildings which represented the religious fervour that animated the country in days past. He thought that a knowledge of these things added so much to the value of pictures such as these, and commended to the Club the suggestion that the "story" told by a picture should not be dominated by the purely spectacular merit of the view.

North Middlesex Photographic Society.—December 10. Mr. E. R. Mattocks in the chair.—Mr. F. W. Cox gave a lecture on "The Life of Constable." The work of John Constable, R.A., was the first definite departure in English landscape painting from the conventional treatment of earlier painters, and was the result of direct and personal impressions of nature. The exhibition in France of his "Hay Wain" and "White Horse" exercised a powerful influence upon the art of landscape painting in that country. His work was not appreciated save by a few until late in life, and he supported himself by painting portraits. On the death of his father-in-law he came into a fortune of £20,000, which enabled him to devote himself entirely to his beloved landscapes. He was born at East Bergholt, Suffolk, and most of his well-known paintings were

done in the neighbourhood. Three of his most important pictures, "The Valley Farm," "The Cornfield," and the "Hay Wain," are in the National Gallery, and his "Salisbury Cathedral" is at South Kensington.

Croydon Camera Club.—The fifty-second Lantern Show of the Croydon Camera Club was held at the Public Hall, George-street, on Wednesday, December 12, with the usual indications of success. The first part was devoted to a visit, made by members of the Club to the Paris Exhibition, the pictures being by Messrs. S. Carley, Stokes, and Beck. These proved to be an unusually even set, notable for good gradation, sharpness, and general interest. They provoked much approval, and Mr. Carley, who described the 60 pictures, received a well-merited round of applause on stepping down from the platform. The above were followed by a series of pictures illustrating the life of the Handy Man. Next on the list were a number of mixed scenes by members, described by the President. Mr. Stanley illustrated some places visited last Easter by the Club, including Cuckfield House, better known as the "Rookwood" written of by Harrison Ainsworth. Mr. Paice showed figure and cattle slides, and Mr. Maclean and Mr. Noaks also contributed a few studies. But best of these series were a number by Mr. A. E. Isaac, the Hon. Lanternist, to whose untiring labours the Club is so much indebted for the appreciation of these shows. Mr. Isaac's slides included some capital scenes of old and picturesque portions of York, and several striking and curious bits of Knaresborough. The peculiar spiral spire of Chesterfield Church provoked much interest, and the series was brought to a brilliant ending with a striking picture of a storm cloud. The third portion was devoted to a lecture founded upon an excursion made last June by the Club to Rochester and district, when some forty or fifty pictures were obtained which illustrated many points closely connected with the life of the late Charles Dickens, and with the places described in several of his novels. The lecturer was the Rev. Cecil H. Fielding, of West Malling, who gave the audience a strong dose of "Dickensiana," with a goodly ingredient of early English history thrown in as a kind of make-weight. Some lecturers there are who know too little about their subject. Mr. Fielding is not of that sort; indeed, he is almost like the gourmet who, asked how many roast larks he could eat, answered, "I could go on eating them for ever." So many things connected with Rochester and Dickens were spoken of that we can find space but for a tenth of a tithe of what fell from the lecturer's lips. As regards the cathedral, it was melancholy to be reminded of the ruthless removal of the ancient spire, and its replacement by the present debased tower which ordinary folk in their innocence no doubt take to be an object deserving admiration and veneration. The old building known as Eastgate House was shown as the one where "Pickwick" hid behind the door of the young ladies' school, and which is also made to figure in "Edwin Drood." Of course, the "Seven Poor Travellers" came in for many remarks, some interiors of it, which had been lent by Mr. Snowden Ward, being much admired. The Bull Inn, associated with "Dr. Slammer," "Jingle," "Pickwick," and other of Dickens' characters afforded much scope for talk. Cooling Castle was glanced at, and Cooling Church also. This is the scene of the interview between "Pip" and the escaped convict in "Great Expectations." Of course, Gadshill was visited, and afforded a number of apropos anecdotes. Time was short for all that Mr. Fielding would have liked to say, or no doubt we should, inter alia, have heard more about Dickens' pet books, of which he has an imposing array in his library, as we noted on the occasion of a recent visit. Here are just a few of their titles:—"Abernethy on the Constitution," Toots' "Universal Letter Writer" (two vols.), Adams' "Precedents," Kant's "Eminent Humbugs" (ten vols.), "Mag's Diversions" (four vols.), Catts' "Lives" (nine vols.), "History of a Short Chancery Suit" (21 vols.), and others which show that our great novelist had a very catholic taste as regards his reading. The Sir John Falstaff and Cobham Hall were also illustrated and described. We should add that the lantern slides, with the exception of half-a-dozen interiors lent by Mr. Snowden Ward, were taken by the following members of the Club:—Messrs. Maclean, Rogers, Noaks, Stanley, Watson, Frost, Carley, and Sandell.

Glasgow Eastern Amateur Photographic Association.—The Annual Meeting of this Association was held on Thursday evening, 13th inst.—The reports showed that the membership paid up was 75, and that, while last year's balance was under 20s., the income of £74 during the year had left the Association with a balance of over £11. Satisfaction was expressed with the reports, especially as the expenditure on equipment of the rooms had been very heavy. Office-bearers were elected as follows:—Hon. President, Mr. W. R. Malcolm; President, A. D. Inglis; Vice-Presidents, Robert Millan and James Kennedy; Secretary, George R. Johnstone, 166, Slatefield-street, Dennistoun; Lanternist, John Leslie; Treasurer, Alex. McIntyre, 6, Craignestock-place; Council, Matthew Crosbie, John Gardner, W. S. Crocket, A. Allan, jun., Matthew Wilson, and D. Johnstone.

Ardrossan Camera Club.—Annual Exhibition.—The Second Annual Exhibition and competition of this Society was opened last week, and will remain open till the first week in January. There was keen competition in all the classes, and the judges, Mr. W. M. Warneke and Mr. Matthew Ballantine (of Mr. Lizars) had some difficulty in coming to a decision in several cases. The pictures of outstanding merit were almost entirely the work of Mr. W. Fotheringham and Mr. J. M. Comrie, in both of whom the Society has members capable of setting an exceedingly high standard. Mr. Warneke and other friends have lent a number of pictures for exhibition. The judges made their awards as follows, a silver and bronze medal being given in each class:—Class I. Half-plate and over: 1, W. Fotheringham; 2, J. M. Comrie; 3, J. C. Guthrie. Class II. Under Half-plate: 1, J. M. Comrie; 2, J. S. Barbour; 3, Thos. Guthrie. Class III. Hand Camera: 1, J. M.

Comrie; 2, G. C. Guthrie; 3, Arthur Craig. Class V. Set of four Lantern Slides: 1, J. M. Comrie; 2, Arch. Ritchie; 3, G. C. Guthrie. Class VI. Enlargements: 1, W. Fotheringham; 2, J. M. Comrie; 3, G. C. Guthrie. Class VII. Set of three pictures taken with "Challenge" Camera: 1, W. Fotheringham; 2, Thos. Guthrie. Beginners' Class—Set of three pictures: J. Macdonald.

FORTHCOMING EXHIBITIONS.

1901.
January 14-19 Blaigowrie and District Photographic Association. The Hon. Secretaries, Blaigowrie, N.B.
February 16-March 9 Edinburgh Photographic Society. Secretary, J. S. M'Culloch, W.S., 10A, George-street, Edinburgh.

Patent News.

THE following applications for Patents were made between December 3 and December 8, 1900:—

- FOCUSING.—No. 21,840. "An Improved Method of Ascertaining when the Sensitised Plate or Film of a Camera is in Focus." A. COATS, JUN.
CAMERAS.—No. 22,200. "Improvements relating to Photographic Cameras." N. CONTI.
STEREOSCOPY.—No. 22,246. "Improvements in the Method of and Means for obtaining Stereoscopic Effects." C. A. BURGHARDT and A. V. HUNT.
FILMS.—No. 22,385. "Improvements in the Preparation of Films for Photographic Purposes." Communicated by Bunt & Luxuspapierfabrik, Goldbach, Germany. P. A. NEWTON.

Correspondence.

- * * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
* * We do not undertake responsibility for the opinions expressed by our correspondents.

THE PERMANENCY OF SEPIA-PLATINOTYPE PRINTS.

To the Editors.

GENTLEMEN,—I have been greatly interested in your recent notes on the above subject. It may interest you, and possibly some of your readers, to know that I have used the method suggested by Peebles Smith for obtaining sepia and brown prints with the ordinary black cold-bath paper. The process was first tried in the summer of 1898, and I find the prints then developed have not apparently altered in the slightest degree, although some of them have been framed, and no particular care taken of the others. Since then this method has been used many times to obtain particular effects. I do not, however, find this process gives really brown or sepia prints, but rather very warm blacks, and half-tones ranging from sepia to brown. I should be glad to send you, for examination and return, prints developed by this process, and, if any of your readers are sufficiently interested, to give them my method of developing the prints, for which I do not claim any originality.—I am, yours, &c.,
HARRY QUILTER.
St. Martin's, Leicester.

[We should be very pleased to examine the prints referred to by Mr. Quilter. Eds.]

THE WATKINS SPEED LIST.

To the Editors.

GENTLEMEN,—In sending the latest edition of our speed list, permit us to draw attention to a point regarding the Watkins speed numbers which has not been previously noted. It is that the numbers indicate without calculation the hand camera exposure (half the full exposure) with mid-day summer sun, and the lens at f-8, thus 100 Watkins requires 1/100th second exposure under these circumstances, 50 Watkins requires 1/50th second, and so on.—We are, yours, &c.,
THE WATKINS METER COMPANY.

Hereford, December 11, 1900.

THE OPTICS OF TRICHROMATIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN.—In Mr. Frederic Ives's treatment of the above subject (Traill Taylor Memorial Lecture), he claims, and emphasises as fundamental the principle that with any trichromatic process the densities of the negative colour records must correspond quantitatively with Professor Maxwell's colour mixture curves.

Mr. Ives's principle is perfectly obvious in reference to photographing the spectrum, for the kromskop or for lantern projection, for in these cases it is essential to preserve the luminosities of the colours by the densities of the negatives; but I fail to see its application in reference to tricolour printing, for in this case we are immediately met with a limited scale and a limited choice of pigments; or, to put the difference clearly, with a kromskop picture of the spectrum, the green sense must be excited less for the green than for the yellow, and, the luminosities of the coloured screen which produces them being the same necessitates that the part of the negative where the green falls shall be represented, as in Maxwell's curve, by a half-tone; but in the case of tricolour printing the yellow pigment will have its full excess of green luminosity over the green pigment, and the use of this same (Maxwell's curve) negative will simply mean the introduction of black into the green, through the printing upon it of its antichromatic colour. This entirely agrees with camera tests, the primaries, especially green, printing heavily in their antichromatic colours.

Under the practical management of Mr. Guy Simmons, we have been working the trichromatic process, in connection with typography, during nearly two years, constantly striving, among other equally important points, to arrive at the most accurate negative colour records, and I have in front of me while writing this note spectrum negatives giving the best results so far.

The densities in these negatives are not in accordance with Mr. Ives's principle, neither would they even, roughly, reproduce his test subject, the spectrum.

Being, in consequence of the great importance of the subject, anxious to get at the truth, will some one mercilessly expose my error—if error there be—by giving the grounds on which Mr. Ives supports his claim, as I cannot discover such in your report of his concise, lucid, and invaluable paper?—I am, yours, &c., HOWARD FARMER.

Polytechnic Institution, 309, Regent-street, W.

Answers to Correspondents.

*** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

* * Communications relating to *Advertisements and general business affairs* should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPHS REGISTERED:—

R. F. Bertollé, Broad-street, March, Cambridgeshire.—*Photograph of C. T. Giles, Esq.*

W. J. Moffett, 53, Bridge-street, Portadown.—Photograph of the Duke and Duchess of Manchester.

Fog.—W. BOYD. So far as we can judge from the negative, which, by the way, arrived in several pieces, the fog is fog in the atmosphere, as the margins of the plate are perfectly free from it where it was protected by the rabbet of the dark slide.

"CLAPHAM, S.W."—We believe the cards you refer to were formerly obtainable of Messrs. G. Houghton and Son, of High Holborn. Velox cards, supplied by Messrs. Griffin and Son, Sardinia-street, would answer your purpose; but these have plain edges.

SITUATION IN PARIS.—"PARIS" writes: "I wish to obtain a situation as assistant operator in a photographic studio at Paris. Would you kindly tell me the best course to take to obtain such a situation?"—In reply: An advertisement in the outer pages of this JOURNAL is the only course we can suggest.

TONING BROMIDES.—"VERNON" writes: "There is a method of toning bromide enlargements by hot water and something else, but I forget what it is. The enlargement is first hardened by a strong solution of alum, so that it is not affected by warm water; but I forget what is used with the warm water. Kindly let me know through your columns."—In reply: Here is a toning formula for bromide prints: Sodium hyposulphite, 10 oz.; powdered alum, 1 oz.; boiling water, 70 oz. The solution should be used hot—from 110° to 120° F.

WIDE-ANGLE LENS.—“GROUP.” To take the room so as to show the whole of the company at the tables a very wide-angle lens must be employed. We are afraid that none of those you have will include a sufficiently wide angle at the distance that the picture has to be taken from. You will, we expect, have to use one not exceeding nine inches focus if all the figures have to be included.

ELECTRIC RETOUCHERS.—“QUEENSTOWN” writes to ask if there is such a machine sold as an electric retoucher, and also if we recommend it as an improvement on the hand work, and where it can be purchased.—In reply: There is such a machine, and it was said to facilitate the work. The address of the agent, whose name for the moment we do not recollect, used to be Memorial-building, Farringdon-street, E.C.

DARK-ROOM LIGHT.—J. CASTLE says: "Can you tell me where I can get some cathedral green and orange flashed glass, also if this would be a safe dark-room light in front of a Bray's No. 5 fishtail burner? —In reply: The glass can be obtained at Hetley's, Soho-square. The light will be quite safe for ordinary plates, but with orthochromatic ones a sheet of ruby should be placed in front, or, at least, till the image is well out, for safety.

PHOTOGRAPHY ON METAL SURFACES.—“A. M. B.” asks for information as to the best means of reproducing a photograph on a metal surface like a watch case. He has tried carbon transfers, but without any good result.—In reply: If the metal is silver, the Daguerreotype process would probably be the best. The powder process might also be used. We should have thought that the carbon process could have been made applicable for the purpose.

LANTERN MEASUREMENTS.—"LANTERN" asks: "What is the usual inside measurements of an ordinary full-sized magic lantern (iron lining), and what air space should be allowed this?"—In reply: The size varies considerably with different makers, but it is better to err on the side of having the lantern too large than too small. If you think of making one, we would suggest that you see those shown in opticians' shop windows, and fix upon the size that seems most convenient to you. Half-an-inch or a little more air space will be good.

Ebonite Trays.—“T. S. M. W.” writes: “1. Will you kindly tell me if there is any way of mending broken ebonite trays? 2. Will you tell me the names of some of the principal makers of ebonite trays?”—In reply: 1. We think there is no effectual way by which a novice can do the work. These trays are now so cheap that they are not worth the trouble of mending. 2. We do not know if they are now made. Those with the ridges or channels are now considered more convenient, and we think have superseded others. 3. The Silvertown Company, Silvertown, E.

CLOUDS IN BROMIDE ENLARGEMENTS.—“ENLARGEMENT” writes: “Can you please inform me the means that are usually employed to give cloud effects in bromide enlargements when finishing in black and white (water-colour)? I have tried oxgall, gum arabic, egg albumen, also damping the gelatine film first and washing colour on dry, but the result is always the same, the colour dries in streaks and patches, and will not lay even. I can work all right with platinotype, but not bromide.”—In reply: There should be no difficulty in the work. Try rubbing the surface of the paper (lightly) over with an ink-eraser that will give it a tooth.

ABOLISHING THE DARK ROOM.—J. W. NEWALL writes: "In the early part of this year a report appeared in some paper which I read at the time, but cannot now recall which, upon liquid solutions for dark-room lamps. I don't mean Howard Farmer's paper which he read before the Royal Photographic Society, but another one, giving exact details and quantities to produce the best effect. If you or any of your readers can help me by giving me the reference I shall be much obliged."—In reply: In the JOURNAL of March 30 last Mr. K. B. Cooper published an article on the subject, which is doubtless what Mr. Newall requires.

FORMULA WANTED.—“M. Q.” writes: “In formula for metol-hydroquinone developer, given on page 295 of the JOURNAL, there is no mention of sulphite of soda. I presume the omission is not intentional, and I shall feel obliged by your giving the quantity necessary.”—In reply: The formula is that given in the foreign journal from which we quoted, the hyposulphite, in this case, being supposed to take the place of the sulphite. Here is a metol-hydroquinone developer with the sulphite: Water, 10 oz.; metol, 7 grains; sodium sulphite, $\frac{1}{2}$ oz.; hydroquinone, 30 grains; sodium carbonate, 200 grains. Other metol-hydroquinone developers will be found in the ALMANAC.

FAULTY BROMIDE PRINTS.—"BROMIDE PRINTING" writes: "I beg to enclose two faulty prints for your inspection, and shall be much obliged if you can give me any advice in next issue. They are contact exposures on _____'s bromide paper, and a majority of the prints show the long black scratches which you will see. I have handled the paper with every care, and I find the same marks even when enlarging, where there is no contact, though they are very infrequent in larger sizes, say, 12×10. They are a great trouble to me, and I have a lot of the paper on hand, so shall gladly welcome any advice?"—In reply: Some papers are prone to give these markings, and we cannot suggest a remedy. Usually, however, they can be cleaned off with methylated spirit, but this does not seem to be the case in this instance. Better communicate with the makers of the paper.

PATENT.—H. BEAUCHAMP. “I see that a patent has been taken out for a contrivance that I and one or two of my friends have had in use in our studios for some years past. It is not of my invention, but that of one of the others. Shall I be infringing the patent if I continue to use it?”—In reply: Certainly not, if you were using it before the date of the patent. What is more, if you had, the patent is of no value whatever.

SILVER STAINS ON NEGATIVES.—“SILVER-STAIN” writes: “During the winter months of the past few years I have been greatly inconvenienced by my negatives silver-staining. I take all precaution, such as drying the negative, the paper (P.O.P.), pads, &c., before printing, and also have the printing room heated, but though I take this trouble my negatives get marked all over with a slight red silver stain.”—In reply: This should not occur if the negatives were thoroughly washed and varnished and all was perfectly dry. It should be borne in mind that if cold negatives are brought into a warm room moisture will condense upon them, as dew. Possibly this may be the source of the trouble.

OLD NEGATIVE GLASSES—EXPOSURE.—“F. H. S.” writes: “(1) I would be obliged if you could tell me what can be done with useless negative glasses? Is the glass of value, if so, how can it be disposed of? (2) I have a 10×8 camera and lens (Dallmeyer) to take a 13×11 plate. In using these, should the exposure be longer in proportion to the size of plate used? or is it only when stops are used that the exposure (for portraits) is required to be longer?”—In reply: (1) Practically the glass is of no value whatever. It is not worth the trouble of cleaning off the films, unless, indeed, it be of large sizes. (2) The size of the plate makes no difference in the exposure—that is governed by the size of the stop used.

VALUE OF Book ILLUSTRATED WITH PHOTOGRAPHS.—A BAKER writes: “I notice in your last issue a short note on ‘Photography and Modern Illustrations.’ I have just bought a book called ‘The Home of Santa Claus,’ and I find it illustrated with over 100 photos, some being good combination photos. It must have taken a great deal of time to arrange and think out the different subjects, and I was wondering whether the photographer was well paid, as I thought of advertising to do such work. I would be pleased to loan you my copy if you have not one, so as to obtain your advice.”—In reply: If our correspondent will let us see the book referred to we will let him have our ideas on the subject.

TEMPORARY SUPPORT FOR CARBON PRINTS.—T. M. FORD writes: “Can you inform me if there is temporary support for carbons that will give more of a matt finish to them than the usual Sawyer’s temporary support? What I want is a dull matt surface, and I know I can get it with opals coated with collodion, but, as I do a great number, it would come very expensive. The support I am using gives a slight shiny surface, which I would like to avoid, if possible, as I think it spoils the beauty of the carbon.”—In reply: So far as we know there is no temporary support sold that will give a matt surface. If the print, after stripping from the support, be soaked in water for an hour or two, much of the gloss will disappear on drying, particularly if it be squeegeed upon as a piece of ground glass.

MAGNESIUM POWDER; INTENSIFICATION.—“H. H.” writes: “(1) Would you kindly let me know whether the magnesium powder by itself is dangerous to use in an ordinary room for taking a portrait, and would you let me know the quantity to use to take an instantaneous photograph with an Ilford Impress plate and a R.R. lens working at f-8? (2) Is it possible to make a fair printing negative from an over-exposed plate which has been intensified with mercuric chloride and blackened with sulphite of soda, which takes hours to print in the sun, and when it is printed it is very flat, with very little contrast?”—In reply: (1) The magnesium powder, by itself, is not dangerous. The quantity necessary to take the portrait will depend upon the distance it is burnt from the sitter. The farther it is away the more will be required. Better make one or two trials from where it is to be burnt—say, commencing with thirty grains. (2) Only by reducing the negative. Try putting it back again in the mercuric chloride. That will usually reduce the image sufficiently.

DISCOLOURED PRINTS.—“AJAX” writes: “I should feel obliged if you would give your opinion as to the cause of failure in the production of enclosed prints. They were, apparently, all right when taken out of the fixing bath, but were all discoloured the next morning, in the condition of those enclosed. The toning, fixing, and washing was done in an outhouse, and on this occasion only a coke fire was kept burning in a perforated pail in the centre of the room, which gave off sulphur fumes. Do you think the fumes would impregnate any of the solutions used or washing water, and so cause this deep yellow appearance?”—In reply: Although such a stove is very undesirable in a photographic workroom, we do not think, in this case, that it had anything to do with the stains, otherwise there would not be some parts of the prints with pure whites. The cause of the stains is that the prints are not fixed. They were not long enough in the hypo bath, or it was too weak, also that the prints were allowed to stick together while in it. Where the solution had free action the whites are pure. There are well-defined marks where the prints overlaid each other.

CARBON PRINTING BY ELECTRIC LIGHT.—B. ASHBURN puts this question: “How long will it take by electric (arc) light to make a print direct from a negative?”—In reply: This is a question that it is impossible to answer, because it would depend upon the power of the light, the density of the negative, the distance of the negative from the light, and the sensitiveness of the tissue, &c., all of which are important factors in the case.

ALUM IN THE FIXING BATH.—“PREMIER” writes: “I should be glad if you will inform me whether the use of the following fixing bath is likely to affect the permanency of bromide prints:—Hyposulphite soda, 8 ozs.; alum, 1 oz.; water, 40 ozs. The hypo is first dissolved in hot water, the dry alum then being added to the solution, which is well stirred the while. The precipitate is then left for a day or so to subside, and the clear liquid only is used. The advantages of using such a bath I find to be clear whites in the ‘fixed’ prints, and a hardening of the gelatine surface, which is a great comfort in mounting. Another point is, this bath keeps clear for a long time, and it is in this particular one may be likely to do wrong in using it after its ‘fixing’ powers are exhausted. Could you give a rule for knowing when exhaustion has taken place?”—In reply: We are no advocates of acid fixing baths for paper prints when permanency is a consideration. There is “no rule for knowing when exhaustion has taken place.” The only thing to judge by is the amount of paper that has been fixed in the solution. The fact that the solution keeps clear is no criterion whatever.

A WAGES QUESTION.—H. BISHOP writes: “I belong to a London firm who make a large number of drawings, maps, and other line subjects, and who are desirous of engaging a photographer. 1. Is there any trade rate of wages paid such men? 2. If not, would you give one some idea of the salary we ought to pay a good, capable, all-round man, as we only require one man? Please note the words ‘some idea.’ 3. The work we want done is the reproduction or reduction of plans to 15×12 or larger by the dry-plate process, producing negatives suitable for making photo transfers from. The man must be able to do all the work, from taking the negative to making a photo-litho transfer or printing from the negative on a metal plate direct, retouching the same and the negative; also large prints by Velox or other gaslight papers; also to make large sun prints from tracings, by the blue, black and white, and other processes, all to be so that it can be done with precision.”—In reply: 1. There is no regular trade rate. 2-3. You require a skilled operator in all the processes you require him to work, and we should say about three guineas a week would be a fair salary to pay him for his services.

A QUESTION OF PRICES.—“BHOUSE” writes: “I am in charge of a local studio. Some months ago I was asked to come and photograph some machinery inside a mill, which I did do. The mill is about a mile from my place of business. Owing to the light on the machinery, of course I had to give it a long exposure. The light was also changeable, and, to make certain, I had to expose two plates, which took me over an hour and a half, all the time of which I had to stand at one place without being able to get out, as my way lay in front of the camera. The size of the photograph was whole-plate. The order was for an enamelled print unmounted, and negative to be given up. I was, furthermore, forbidden to make any use whatever for myself of that photograph, and was to keep that as a secret, owing to personal reasons of party concerned. Then, after my complying with all his wishes, and giving satisfaction in every way, the party concerned objects to the price charged by me, saying that it is too much. I do not like to have any bother with that gentleman, and should therefore be obliged if you would say what you think is a fair charge for a job of this kind, taking, of course, everything in consideration?”—In reply: Prices for this class of work vary considerably, and we are scarcely in a position to give an opinion on a question of prices. We should say, under the circumstances, that from a guinea to a guinea-and-a-half would be a fair charge.

SNOW SCENE PHOTOGRAPHY.—“WINTER” writes: “Please be kind enough to reply to the following in next week’s paper: 1. For snow scenes in bright sunshine do you advise slow, medium, or special rapid plates? Should the plate be chromatic or ordinary? If the former, should a pale yellow screen be used? What stop would you suggest? and, approximately, what exposure and developer? 2. For snow scenes in dull, foggy weather what kind of plate and speed would you advise? 3. What is the most suitable kind of plate for catching the effect of a sunbeam striking through the trees in a forest? Should it be slow, medium, or special rapid, and, if a chromatic, should a screen be used? 4. Do you believe in a brown paper or cardboard shade, projecting about six inches beyond the lens hood, to assist in producing brilliant negatives; and, when working in a dull and unfavourable light, would such an arrangement be an assistance in helping the lens to concentrate such poor photographic light as there happened to be?”—In reply: 1. A plate of medium rapidity we should prefer, and chromatic. If the light is yellow a screen is not necessary—the largest stop that will give the desired definition with the lens you employ. The exposure will, of course, depend upon the light at the time, and the aperture at which the lens is worked. Use the developer with which you are most familiar. 2. A rapid or a medium rapid plate. 3. Either will do. A screen is scarcely necessary if a chromatic plate be used. 4. Yes, it would shield the lens from instantaneous light.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1901.

Edited by THOMAS BEDDING, F.R.P.S.

What some readers think of the book:—

- “A splendid ALMANAC.”
- “A handsome present.”
- “Grows bigger and better every year.”
- “More interesting than ever.”
- “More copious and more useful.”
- “A necessity to the busy worker.”
- “Better than all its predecessors.”
- “I congratulate you heartily on issuing such a good book.”
- “Most acceptable and useful.”
- “Grows more valuable and interesting every year.”
- “A capital issue.”
- “Excellent in every feature: the letterpress, diagrams, tables, and illustrations are most helpful.”
- “A first-rate and exceedingly cheap publication, fully up to, if not beyond, the standard of former years. . . . A combination that must mean continued and strengthened life.”

Some Press Opinions:—

- “A mass of useful information for all photographers, professional and amateur.” “Shrewsbury Chronicle.”
- “Invaluable to all who have to do with photography.” “Bedfordshire Times and Independent.”
- “This monumental work.” “Pharmaceutical Journal.”
- “An annual of the greatest interest.” “Dundee Advertiser.”
- “Any one interested should make a point of getting a copy.” “Sussex Daily News.”
- “As a reference book for photographers it is probably unrivalled.” “British and Colonial Druggist.”
- “There is enough to learn in it till the next ALMANAC appears in 1902.” “Invention.”
- “Bigger and more useful than ever.” “Oxford Times.”
- “The ALMANAC should commend itself to all interested in the use of the camera.” “Oxford Chronicle.”

* * * The 1898, 1899, and 1900 editions of the ALMANAC (20,500 copies) were each sold out within a few months of publication.

* * * The 1901 Edition, just issued, has been entirely sold out in less than three weeks from publication. This result is a record without parallel either in the history of the ALMANAC or any similar publication.

EX CATHEDRÀ.

ONE of the most marked signs of the close of the century is the extent to which at last the public mind has become open to the fact of the length to which British industrial supremacy is being threatened by German competition. In our manufactures and chemical products alike the vast strides made in Germany have tardily been recognised, and the marvellous phenomenon of a country which a quarter of a century ago was little more than an agricultural community coming to the very forefront in industrial work has really awoken alarm. In one special direction German products have a particular interest for photographers—the Jena glass, which, we need scarcely now inform our readers, is not, as some yet suppose, one, but many. Twenty-four years ago the finest optical glass was made in this country, but in a report of the London Exhibition of that date Pro-

fessor Abbe pointed out the need for improvement, if improvements in microscopes were to be made, and showed where attempts in that direction by Harcourt and Stokes had failed. There the matter rested, so far as we were concerned, but not so in Germany. Abbe, in connection with a glass manufacturer, Schott, conducted an elaborate and laborious series of investigations, in which they were aided by extremely substantial pecuniary help from their Government. The result was the production of a large number of new kinds of glass, which, by reason of varying dispersive powers for similar refrangibilities rendered possible the construction of optical instruments with hitherto undreamt-of possibilities, powers which once were said to be contrary to the laws of science to produce. Photography has concurrently with microscopy been the gainer, and the manufacture of photographic lenses has been revolutionised. In 1888 Germany made nearly the whole of the glass it required for optical instruments, and very soon it began to export this glass. In 1898 the trade had so grown that no less than thirty thousand pounds' worth of what we might term the raw glass was exported, while in the manufactured form microscopes, photographic lenses, &c., no less than a quarter of a million pounds' worth was sent out of the country. With the dawn of a new century we may hope that our own country, thoroughly awake to the needs of the situation, will show the world that it cannot be beaten on this ground. Already some of the finest objectives of the day have been invented and made in this country, and we may hope still for advance.

* * *

OVER the signature of A. S. Herschel there appears in last week's "Nature" a long and interesting letter embodying mainly the results of Mr. Herschel's experiments in electricity of stripping. He finds that when using solio and P.O.P. generally there is too great a tendency to too complete adherence to the glass, and he has chiefly made use of albumenised paper. When observing the separation of the print from the glass surface he noticed strong electrical attraction between the glass plate and the freshly-separated paper. The glass best adapted to show the effect is very hard unhygroscopic, and the print must not be squeegeed, but merely laid on wet, and the superfluous water freed by swinging, then the back gently padded with a soft cloth. It should then be left to dry spontaneously, back upwards. In a damp atmosphere the paper remains adherent, but in a warm room it separates spontaneously with audible clicks as the tension gives way. If the paper be rubbed at the back just before it is ready to separate it will remain adherent through electrical attraction. After vainly trying to observe a luminous effect, he at last observed a light flash. "The momentary gleam of the electric light play can be very easily observed by holding an albumen paper print thoroughly well self-dried on glass, proper side downwards, in a perfectly dark room over a hot room stove to produce the paper's separation, and by stripping the print off downwards as soon as some edge of it has grown loose enough—probably with some degree of light—to allow it to be taken in the fingers. I have by this means now seen those brush and glow lights flitting beams a second time, and there seems to be no difficulty of producing them in varied form and brightness by this method of proceeding."

* * *

POSSIBLY because of the great distance to be travelled to get a proper observation, the eclipse of May, 1901, does

not attract much attention; but we may say that those who desire to visit the Malayan Archipelago and observe the eclipse at the same time will find all the information they need in a pamphlet issued by the Government of Batavia.

THE UP-TO-DATE PROCESS-MONGER.

THERE is little doubt that during the last ten or fifteen years many gentlemen, who it is only fair to class as amateur workers, have, in pursuance of their delightful hobby, been able to discover numerous ways in which photography may be applied to aid them in their particular line of business; and it is only reasonable to state that in numerous instances several fresh departures in the method of preparing and producing various articles in commerce have been introduced as a result of even the slight acquaintance such gentlemen have had as amateur workers. Very many of these fresh applications of photography are, no doubt, entitled to be classed as original ideas, for, were it not for the special knowledge on the part of some individual connected with a particular profession or trade, very probably the casual photographer might never have hit upon the idea of applying photography to such purposes. On the other hand, it is surprising how much that is as old as the hills is rediscovered by those whose limited experience of photography does not enable them to really discern when a bona-fide fresh discovery has been made. It would be perhaps too much to expect that, from among the vast ramifications of photography, as applied to trade and even scientific purposes of the present day, every now and then certain individuals should not herald forth, in some particular line of business, the discovery of a valuable application of photography, by means of which improved methods in working as well as probably some fancied saving in cost of production can be effected. The secret process-monger, it may be truly said, has been in evidence ever since the early days of photography, for at that distant period of time when our baby was a nursling in arms doubtless there was a very wide field for fresh discoveries, much more so than really exists at the present day. There is, however, a noticeable difference between the process-monger of years ago and that of to-day. In the early days of photography, whenever a really fresh discovery was made, the custom was for the inventor to offer its advantages to photographers generally, and by persuading them to adopt such, and by bringing the same prominently before their customers, many photographers recouped themselves for what little outlay they expended in the way of premiums for making such. Then, however, the practice of photography was a very different matter to what it is at the present day, and the "process-monger" had practically no alternative but to offer his discovery to those only who were capable of working it, viz., professional workers. All this has been changed in recent years, for photography has been placed in the hands of every one, on account of its simplicity, until it is really difficult to find in any place of business the individual who is not possessed of more or less knowledge in photography.

The process-monger has, therefore, a wider field to work upon, and it would appear as if we are about to witness what may be termed a revival of this method of doing business in the hope of earning a livelihood. To attempt to enumerate a tithe of the valuable discoveries that have from

time to time been trotted out by those who honestly believed they had discovered something new, but which in point of fact was not so, would be difficult indeed. As a rule, so long as such discoveries were offered to professional workers only, there was little difficulty in the matter, for it was at once apparent, in the trade or profession, that a fresh departure of a genuine character had been introduced and invariably there followed an admission from professional workers, when a thing was really new; but, on the other hand, there is no doubt that very much that was as old as the hills was from time to time being hawked around by unprincipled individuals in the hope of deriving a benefit from the same. At that distant period of time it was, therefore, less difficult to discern what was "genuine" from false. But, in the present day, by reason of the fact that process-mongers have a wider field to work upon, and not infrequently confine their attentions to the application of photography to certain articles of trade, they succeed in many instances in extracting a mere nominal fee of a guinea or two. Simply by reason of the fact that the sum asked is not a large one, and as there may be something in the latter after all, people are induced to have a deal on the score that the risk is not a heavy one, even supposing there be little or no advantage in what is eventually disclosed to them. To say that much of this sort of thing does not exist at the present day would be stating what is really not fact, for within the past year or two several trades have been subjected to attacks from individuals anxious to divulge some secret method of working, of which photography may be termed the base, and it is only fair to state that injury to the bona-fide professional worker can be traced to the operations of such people. Take any trade in which from time immemorial photography has played an important part. Here we find the work has been well and truly performed or the business firm by a professional worker of good standing, who in return receives a fair remuneration for his work, keeping his method of performing the same to himself, just as any other professional worker would do. The up-to-date process-monger comes along with his fancied discovery, both as regards its being something new, and at the same time seeing that the party knows a little about photography), the impudence of doing the work being so great, sees nothing to prevent his doing his own part of the same.

Now, to many minds, there may at first sight appear nothing imprudent or anything liable to injure the professional worker in all this, but on closely examining this line of procedure it will be seen that very much injury is done to the respectable professional by such people. First of all, as is well known, there are numbers of cases, in which special work is performed for special trades, in which not only the material employed by the professional is kept secret to himself, but also the method of using the same; and in cases of this kind, by reason of such knowledge being purely professional secret, and unknown to those even who employ and pay for the work produced, the moment the process-monger comes along and divulges what is really a well-known method, and one regularly used by the photographer, the temptation is very great on the part of the employer of such, seeing he has a slight acquaintance with photography and has now been placed in possession of the knowledge of the proper material to use, to try himself to do what the professional photographer has hitherto been engaged to perform. In one high-class trade quite recently

this sort of thing has been practised, to the injury of both the professional and the tradesman. In the case of the latter, for years the professional was doing a special class of work, the method being unknown to his employer, and so long as the latter kept his orders regularly in the same channel the method of producing these results was not imparted to any one else in the trade, so that the tradesman had virtually an interest in keeping the photographer's method of working a secret. The moment the process-monger comes along he does not rest satisfied with imparting the information to one only, but he makes it broadcast over the whole trade, and injures the professional and tradesman alike, who to perfect the method of working may very probably have spent a considerable sum of money, and is therefore justly entitled to some preference in the matter. During the last twelve or fifteen years there has been a great outcry by professional workers regarding the injury they receive at the hands of thoughtless amateur workers, and much has been written as to how such might be protected so as to secure immunity from loss to their business. No doubt many good cases of where injury has been done to honest, hard-working professionals could be shown, but hitherto no possible plan of protection seems to have been devised, and photographers have just had to grin and bear it. It would appear now that a fresh danger threatens the profession by an outbreak of secret process-workers, who in reality in many cases are divulging nothing that is unknown to the professional, but who, by reason of imparting certain information in circles where such is likely to be of interest and value, do an incalculable amount of injury to professional and tradesman alike.

Intensifying and Toning Platinum Prints.—In Eder's *Jahrbuch* the following means of modifying platinum prints are given by Raimund Rapp, of Vienna. To intensify a print, wash it thoroughly and immerse it in the following bath:—

Cold saturated solution of gallic acid	50 c. c.
Water	50 "
10 per cent. solution of silver nitrate	2 ..
Glacial acetic acid	10 to 20 drops.

The print will intensify slowly, and, when it has acquired sufficient depth, wash it in two or three changes of water to which a little acetic acid has been added. The silver, which has been deposited on the image, is then converted to platinum by using the following bath:—

Potassium chloro-platinite	1 gramm.
Phosphoric acid	15 c. c.
Water	600 "

Wash the print once more.

As the process is based upon physical development, by the introduction of various modifications other tones may be secured after the print has been treated with the gallic acid and silver bath. For reddish tints use the well-known uranium intensification formula very much diluted. The bath may be reduced to one tenth of its ordinary strength. Green tones may be obtained by treating a red or brown uranium toned print with a twenty-five per cent. solution of sulphate of iron. If a print toned green in this way is immersed in water acidulated with hydrochloric acid, it will acquire an intense blue tone. Less pronounced green and blue tones may be obtained by immersing the silver intensified print in the following bath:—

Water	50 c. c.
Ferricyanide of potassium solution (1:50).....	20 "
Ammonio-citrate of iron solution (1:50)	10 "
Uranium nitrate solution (1:50).....	10 "
Glacial acetic acid.....	10 "

The prints gradually acquire a green tone, but, if the subsequent washing is too prolonged, they turn blue. A very fine deep blue tone may be obtained with the following gold bath:—

Water	1 litre.
Nitrate of lead	15 grammes.
Sulphocyanide of ammonium	40 "

After filtration add:—

Chloride of gold solution (1:50).....	20 c. c.
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The prints may remain several hours in the bath, during which time intensity of the tone increases. Wash for about an hour.

A New Pigment Process.—The Actien-Gesellschaft für Anilin-Fabrikation, of Berlin, have just patented a new pigment process, which strikes one as being very simple and likely to be of value, in that prints in very many different colours may be obtained without the necessity of transfer, and, further, which has the advantage of giving a printed-out image. As an example of the process they give the following directions. Paper is soaked for a minute in the following solution:—

Soft gelatine	6 parts.
Ammonium bichromate	16-20 "
Water	100 "

Dissolve by the aid of a gentle heat, and dry in the dark. Expose under a negative for about half as long as is required for a gum bichromate print, and then wash quickly in frequently changed water to free it from the undercomposed chromate; the last washing water should be acidulated with 0·1 per cent of sulphuric acid. Development is effected at ordinary temperatures in solutions of which the following is typical:—

P.-phenylenediamin	1 part.
Sodium bisulphite	1-2 part.
Water	600 "

The picture quickly appears in a dark brown colour, and is then washed in acidified water and dried. If instead of using p.-phenylenediamin one of the following be used, all possible colours may be obtained:—dimethyl-p.-phenylenediamin, tolulene-p.-diamin, 1·5 naphtholendiamin, p.-amidophenol, methyl-p.-amidophenol, o-p.-diamidophenol, β -tri amidophenol, pyrogallol, 1·5-dioxy naphthaline, p.-amidodiphenylamin, p.-diamidodiphenylamin, aniline, dimethylaniline. The theory of this process is that the chromium dioxide which is left in the image after the prints have been washed is a strong oxidising agent, and converts certain colourless organic compounds of the aromatic series by oxidation in colouring matters of various shades.

A New Iron Printing Process.—Messrs. A. and L. Lumière have patented the use of ferric saccharinate as a light-sensitive salt for an iron printing process, which has the advantage of greater keeping power, a property which is conspicuous by its absence in most of the iron processes. A solution of saccharinate of barium is added to ferric sulphate, in the proportion of the molecular weights and an insoluble precipitate of barium sulphate is formed which can be filtered out leaving a clear solution of ferric saccharinate. Gelatinised paper is painted with this solution and then dried in the dark, and then exposed in the ordinary way. The image is developed by using ferrid or ferrocyanide of potassium or other salts which will give coloured compounds with the ferrous salt produced by light. .

The National Photographic Record Association.—

We are informed that at the last Council Meeting of the Association 366 photographs were presented from all parts of the kingdom, forming a valuable addition to the collection, recording, as they do, some of the most interesting subjects, both from an antiquarian and historical point of view. The President, Sir J. Benjamin Stone, M.P., sent in 100 prints taken in Warwickshire, including a series of

Stratford-on-Avon, and an interesting record of collecting the "wroth money" at sunrise at Ryton-on-Dunsmore. Mr. Sulman gave a set of the old historical houses of Hornsey and Highgate, many already removed. The following were also included: One hundred and three from Mr. Geo. Scamell, Hon. Secretary, of the historical houses of London, and the old Sussex churches, including Bosham, Sompting, Shoreham, &c.; some of Old Newgate by Mr. T. Bolas; Canonbury Tower and other contributions by E. Scamell; Worcester Cathedral by F. Littledale. Many especially interesting records of Irish life and antiquities by Mrs. Muriel and A. Hogg, the latter sending a particularly fine series of the Tumulus of New Grange, the interior views being splendid specimens of flashlight work. The Rev. A. C. Harvey contributed an interesting set of photographs of the old parish register, showing extract of Act for burying in woollen—affidavits that such had been done—and another page certifying that certain families had paid the penalty of 5*l.* that their friends might be buried in linen. Mr. Clark forwarded a set of old crosses at Llantwit Major. Mr. Calcott an interesting record of many of the old houses of Bristol, several of which have been already removed. Mr. Felce a fine series of Norman capitals and misereres in the Northampton churches. Mr. Hodgson a long record from Kingston-on-Thames, and Mr. F. Parkinson a very complete set of the Easter sepulchre at Heckington Church. These photographs have now been forwarded to the British Museum, and together with those already deposited make up a collection of nearly 1600 prints contributed by members of the Association.

JOTTINGS.

It should strengthen the hands of those gentlemen who have undertaken the task of carrying on the Camera Club in the new century to know that a great many persons outside the Club who might, with favourable circumstances, be disposed to seek membership, are sympathetically interested in the successful accomplishment of that task. Amongst my own acquaintances I can count several who are in this category. The times are favourable to new departures of most kinds. Sooner or later all mundane institutions tend to slacken on the journey of progress, and then it becomes necessary to apply the first law of nature, in order to avoid total stoppage. Quoting the word of the amiable Mrs. Chick, we all occasionally, in the affairs of life are compelled to "make an effort;" and, in the case of the Camera Club, it is just a little "effort," and nothing more, that is needed to quite completely vitalise it. Socially and photographically the world is still all before it, and, with modern and vigorous methods of administration, it should be a comparatively easy matter to put it financial position on a permanently satisfactory basis. That this will be done, readers of this paragraph may take it from me there are the best possible reasons for believing. I have had an extensive and peculiar experience of British photographic institutions—the R.P.S. the Convention, the Benevolent, the extinct Central Photographic Club, and several small societies. They have brought me many pleasures and friendships, but I look back almost lovingly upon the last few years, during which I have had the happiness of taking mine ease at the Camera Club. In photographic society matter I fear I am a difficult person to please; yet, if there is one thing which I hope and believe the mysterious new century will not rob me of, it is my favourite corner in Charing Cross-road. So, gentle men of the Advisory Committee, the best of luck attend your efforts.

THE McDonough-Joly process of colour photography has lately excited much interest amongst photographers; less, perhaps, on account of the system itself or the nature of its results, than of the part which Mr. Snowden Ward has taken in bringing it to the notice of the public. Mr. Ward, a responsible journalist, has, in my hearing, been adversely criticised for so prominently associating himself with an enterprise which appears to be nothing more nor less than a commercial speculation, but it has evidently escaped general notice that he has not neglected the earliest opportunity of clearly defining his position in the matter. At the meeting of the Royal Photographic Society, on December 11 (see the JOURNAL, p. 797), Mr. Ward, before commencing his address, "disclaimed any commercial interest in the

bject." This is a phrase upon which the very broadest interpretation should be put, and it is to be hoped, in justice to Mr. Ward, at those—and I have heard many—who have expressed doubts on the subject will fully accept his disclaimer. So much for one aspect a matter which is of acute importance to press and public alike. Mr. Ward went on to inform his hearers that the McDonough-Joly process "had no commercial aspect at present, and there was consequently no immediate prospect of members being able to purchase the necessary apparatus and materials with which to pursue their investigations. He added that he was informed, on the best authority, that the public would not be asked to subscribe to any scheme or company for exploiting the McDonough-Joly process." I call attention to these statements for the benefit and information of those persons who have hastily criticised Mr. Ward's association of his name with the McDonough-Joly process, or rather with the company not unnaturally assumed to be about to exploit it. I offer comment on these points beyond saying that, in company-promoting schemes which take colour photography as their bases of operations, the intervention of a photographic journalist is a matter which carries with it the very gravest risks of misconstruction.

HAVING detached the name of a *confrère* from a matter with which seems it has been improperly associated, "I should like to make one two remarks," as the speakers at meetings fall into the habit of doing. I have the authority of an American friend—an expert in such things—for stating that the McDonough-Joly process was taken up tentatively in the United States by a few professionals, who produced some very pretty portrait transparencies indeed, only to discover that there was no demand for them amongst their sitters. My informant also averred that he only knew of one amateur who had succeeded with the process. Against these statements, however, must be set the undoubted fact that some very pleasing pictures indeed various American workers have been, and are being, shown in this country—also some others which are scarcely so satisfactory as colour renderings. Nearly three years ago the Natural Colour Photograph Company had an exhibition of transparencies by the Joly process at the Crystal Palace Exhibition, and some of the results were strikingly good, *sui generis*. Between that process and the one with which the late Mr. McDonough's name has been linked the points of difference are slight indeed. They consist in the main—so far as can be discovered—of closer rulings of the taking and viewing screens. This may be an improvement, but it can scarcely be called an advance. Those responsible for the exploitation of the McDonough-Joly process in this country appear to be acting in entire ignorance of what has already been done here. It is only right they should be told that they are late in the field. With regard to the adaptation of the process to paper: the superposition of a black image on paper ruled in three colours produces effects that can only be described as sombre. It is a method that might suit some subjects; but generally I should think ordinary three-colour block printing would be considered preferable. Then we have the brilliant suggestion to coat paper ruled in colours with gelatine chloride printing-out emulsion, so as to get trichromatic results in an ordinary frame—an idea which I should very much like to see put into practice.

THE whole of this business is "wropt in mystery." If no appeal to be made to the public for financial support, why all these demonstrations and exhibitions? There has been an exhibition at the New Gallery; a demonstration at Glasgow fully reported in the local papers, one of which (in my possession) distinctly states that a large company is to be formed; and the transparencies have been shown at the Cleveland and Ashton-under-Lyne Exhibitions. There have also been the papers and exhibitions at the Royal, the Camera Club, the Photographic Club, and the Queen's Hall. A sheaf of newspaper cuttings about the process lies before me, and from time to time communications on the subject have been published by the Colour Photo Company of Birkbeck Bank Chambers. I find it hard to reconcile all this activity with the pronouncement that the usual company is not to be formed. The latter course is what one might naturally expect to be followed. Why should it not? The whole

matter is purely one of business. The science of the process could be perfectly well provided for by the reading of one paper at one meeting. Driven into a corner by the denial that a public company is to be formed, one is really puzzled to account for these many meetings and exhibitions. Can it be that the Colour Photo Company, Mr. Tripp, and the other gentlemen are disguised philanthropists banded together for the blessed purpose of entertaining the public with pretty pictures, free gratis, and for nothing? But seriously, there are many things in connexion with the McDonough-Joly process and its presentation to the British public which require to be cleared up in the interests of those directly concerned. If it is really the case that it is not contemplated to attempt the flotation of a company on the process, the Colour Photo Company is happily absolved from the necessity of listening to advice which in the circumstances of the case is superfluous. And that advice is simply, Don't. For in my humble opinion the McDonough-Joly process of colour photography on glass or paper stands very little chance indeed of being taken up by professionals, amateurs, or the trade, to such an extent as would warrant the formation of a public company having the smallest hope of resulting in financial success.

THE Editors of *The Photogram* send me the annual bound volume of that elegant publication, together with a pretty calendar for 1901 for which I tender them my best thanks. The former makes a very handsome and at the same time useful gift-book, and as I glance through its carefully filled pages of instructive photographs—not grams—and judiciously chosen matter, I am struck by the wide field of photographic service which *The Photogram* sets itself to occupy. The illustrations in particular seem to give me at a glance a kind of panoramic impression of British photography during the closing year. To the monthly issue of *The Photogram* for January 1901, which lies before me, a special interest also attaches. For months past many references have been made to the "New American School of Photography." In the nature of things only a minority of photographers can secure the opportunity of examining these photographs. The next best thing, of course, to do is to study reproductions of them. In the January *Photogram* there are some eight phototypes of examples, that were hung in Russell-square in October last. Mrs. Kasebier; Mr. Clarence White; Mrs. Sears; Mr. Steichen; Mr. Watts Lee; Mr. Eugene; Mrs. Russell and Mrs. Devas are represented in this collection, which gives one an excellent idea of the style of work of which the 400 American photographs consisted. The reader, too, will have the inestimable privilege of perusing an article by Mr. Eduard J. Steichen, on the "School," of which he is a member, and of seeing a most wonderful portrait of himself by himself. On no account should this or Mr. Eugene's *Adam and Eve* be missed. Emphatically *The Photogram* for January 1901 should be bought, conned, and treasured, by everybody interested in modern pictorial photography.

WRITING as I do, within a few hours of Christmas Day, 1900, I thank with all my heart the many friends from near and far who have sent me reminders of the Season of Goodwill. In a few days a year and a century will close, and I suppose there is not one of us who between this and Tuesday next will not wonder in silence what the New Time holds in store for us. May it realise for all who read these lines the very best they can desire for themselves! Nearly half my life has been passed in pleasant association with THE BRITISH JOURNAL OF PHOTOGRAPHY and its friends and readers, and I hope that in the new century it may long be my happiness to wish them all what I sincerely wish them now, *A Happy and a Prosperous New Year.*

Cosmopolitan

LIGHT FILTERS.

[Translated from the "Photographische Correspondenz."]

A LIGHT filter may be described, generally, as any medium which absorbs light and allows any of the various kinds of light (wavelengths) comprised in the entire spectrum to pass freely. The transmitted rays are called filtered light, and may belong to widely differing regions of the spectrum.

In its restricted meaning, however, only those media are called light filters which have desirable selective qualities, or, in other words, which may be used for definite purposes. It is a well-known fact that the selective properties of certain media are undesirable and even injurious. We need only mention the troubles due to absorption by the atmosphere, and various kinds of glass, minerals, &c. To all appearances they are colourless, yet they underlie certain problems in astronomy, and more especially astro-photography, micro-photography, spectro-photography, and other photographic processes.¹

These absorptions mostly concern the very valuable region of the ultra-violet, on account of its great chemical activity, and we are much indebted to the classic work of Schumann,² Eder, and Valenta,³ and H. C. Vogel⁴ (and likewise to Buss⁵ for his examination of dye-stuffs), which supply us with valuable conclusions, as well as the means of avoiding, as much as possible, the undesirable qualities of light filters.

The following remarks are restricted to light filters of desirable characteristics, and refer to their peculiar properties and applications.

According to the various methods of examining light, light filters may be classified as follows:—

1. Photographic.
2. Visual.
3. Bolometric.

A large part of the ultra-violet region of the spectrum (about $100\mu\mu$ — $370\mu\mu$) is very suitable for photographic examination, also the whole of the visual region (about $370\mu\mu$ — $750\mu\mu$) and a small portion of the ultra-red.

Ocular observation by direct means is, of course, confined to the visual part of the spectrum, whilst the bolometric method (developed by Langley and Rubens), in addition to the visual portion, also comprises an extensive tract of the ultra-red (about $750\mu\mu$ — $2800\mu\mu$).

Absorbents of the ultra-red have hitherto been of little practical value.⁶ For this reason we shall omit them from further consideration. We will give a short description of the visual light filters, but our principal attention will be devoted to photographic light filters, which at present have become of the greatest practical importance.

1. VISUAL LIGHT FILTERS.

The history of visual light filters is connected very closely with the history of the theory of colour, and especially with the theory of colour absorption. The Egyptians were acquainted with coloured glass, but not till later was the preparation of transparent glass successfully accomplished. The properties of various media as light filters have since been applied in numberless forms in manufactures and the arts, as shown in various branches of dyeing, ornamentation, painting, &c. They are especially exemplified in the application of stained glass to the decoration of churches, to theatrical purposes, and to signalling. Coloured lights have also been invented, as a substitute for light filters, for many purposes (Bengal lights, &c.).

So far as I am aware, the first conscious scientific application of light filters was made by the many-sided Florentine artist, Leonardo da Vinci (1452-1519),⁷ who used coloured glasses for the analysis of mixed colours.

Light filters have since been used for scientific purposes, especially in the study of the theory of colour. I may mention as modern applications the use of filters for purposes of physical optics, and for spectro and polarimetric measurements. In physical optics they are used in studying the laws of light sensations, and for the selection of certain physiologically active light rays, &c. (coloured spectacles, chambre rouge, &c.).

Light filters are also used extensively for technical purposes. From numerous examples we select a few which are mentioned as being peculiarly interesting.

Monochromatic filters are recommended for use with imperfectly

¹ We include here many cases in which too much dye has been used in preparing the photographic film, thus inducing screen action.

² Unfortunately, Schumann's numerous works are widely scattered, and difficult of access. Much may be found in Eder's "Jahrbuch," which is an invaluable record, and I have used it extensively for this paper.

³ "Denkschriften der math.-naturw. Classe." Vienna, 1894, vol. lxi.

⁴ Ibid. 1896, vol. xlvi.

⁵ Reference in the "Photographische Correspondenz," p. 368. An original contribution to the spectrum analysis of some dye-stuffs, &c.—"Forschungsberichte," Munchen, 1896. See also Kruss: "The Absorption of Coloured Rays by Glass, and table of absorption of coloured glass." Eder's "Jahrbuch," 1890, p. 45. Eder's "Rec. und Tabellen," 4th ed. p. 70.

⁶ Such filters have special application to micro-projection, where the heat rays must be eliminated as much as possible as a safeguard. Further details may be found in the recent works of Rubens.

⁷ "Trattato della Pittura," Paris 1631, chap. xxxi.

corrected lenses (secondary spectrum) in order to focus the image sharply. In such cases coloured focussing discs are specially recommended (Francotte),⁸ or, preferably, monochromatic spectacles. Beck⁹ recommends green spectacles (phototone) for landscape photography, to facilitate a better estimation of the relative values of light and shade. Yellow filters are much liked as an adjunct to telescopes, field-glasses, &c., and agreeably modify the image. In America blue glasses have been inserted in field-glasses for the detection of the slightly yellow gases of smokeless powder, but I do not know with what success.

For viewing the so-called anaglyphs, spectacles with glasses of different colours are used. The anaglyphs consist of two images printed one over the other in complementary colours. Upon examination through spectacles of corresponding colours, each eye perceives but one image, that is to say, for each eye one image is eliminated. As both images are stereoscopic, they are united and seen in relief.¹⁰

Extensive application is also made of light filters in the synthetic methods of producing mixed colours. These are very numerous, and I mention the following:—

1. Additive three-colour projection (Maxwell 1861, Ducos du Hauron 1869, v. Bezold 1885, Ives 1888, &c.).
2. Additive four-colour projection (Scott, 1891, &c.).
3. Additive methods with party-coloured screens (MacDonough 1892, Joly 1894, Brasseur and Sampolo 1897, &c.). (Additive printing process, Intern. Colour Photo Co., 1899.) (Textiles, Szepanik, 1900.).
4. Subtractive methods for tri- and poly-chromatic positives (Ducos du Hauron and Cros 1868, Vidal 1891, Ives 1895, Selle 1895, Lumière 1895, &c.).
5. Subtractive methods of tri- and poly-chromatic printing: Ducos du Hauron 1869, Kraus 1890, Hofmann 1900, &c.; colour printing (Scholler, Kuhn, Henneberg, Watzek 1898, &c., gum bichromate; Vallot 1896, bleaching process; Vaucamp 1897, three-film process; Noack 1897, diazo process).
6. Subtractive methods of three-colour photo-mechanical printing: Le Blon 1735, Gauthier 1745, &c. (Intaglio); Weishainpt 1835, Collen, Ransonnet 1865 (lithography); Husnik 1870, Albert 1786, Ulrich 1890, &c. (collotype); E. Vogel-Kurtz 1892, &c. (typographic).
7. Subtractive three-colour processes in dyeing and ceramics: Du Farg 1737, &c.; Vidal 1890, &c.

The colouring materials in all these synthetical mixed processes are to be regarded as light filters, although they are not usually so described, because their action depends exclusively upon their properties of absorption.

2. PHOTOGRAPHIC LIGHT FILTERS.

The ortho-, iso-, or pan-chromatic process has evolved from the efforts which have been made to render coloured objects photographically in their natural tone values. Nevertheless, the name only indicates the end which these processes have in view. We do not know of any process, yet, of a *purely* photo-chemical nature, which in its qualities of colour sensitiveness perfectly corresponds to the photo-chemical processes of the normal human eye. The curves of sensitiveness for the spectrum show considerable elevation in the blue and violet in the case of all modern photographic preparations, without any exception. In order to obtain a correct, orthochromatic curve we must generally use a yellow filter as a means of compensation.

3. COMPENSATING FILTERS.

Fig. 1 is the schematic representation of the action of the compensating filters, c_1 , c_2 , and c_3 , the sensitiveness of the process being x y .

The selection of the best possible compensating filter depends upon the nature of the process curve, as shall be shortly described. The process curve, as might be expected, also depends upon the quality of the light used.¹¹ This may be selected in such a manner that a compensating filter becomes superfluous.

Good compensating filters should not entirely eliminate any visible zone of the spectrum, as, for instance, c_2 and c_3 , in fig. 1; they should only subdue, as in the case of c_1 . On the other hand, the ultra-violet should be quite eliminated.

There are many known absorbents of ultra-violet, and they are

⁸ "Journal of the Royal Micro. Soc." 1892, p. 270. Eder's "Jahrbuch," 1895, p. 380.

⁹ Eder's "Jahrbuch," 1895, p. 358.

¹⁰ The process was worked out in 1853 by Rollmann for drawings (1858), by d'Almeida for projection; and, later, by Ducos du Hauron for photo-mechanical printing. Instead of light-filters, polarisers have been used for projection by Anderton, Boys, &c. For various applications of polarised light in photography, see Eder's "Jahrbuch," 1895, p. 406.

¹¹ Abney. Eder's "Jahrbuch," 1896, p. 128.

irtly characterised as very active fluorescent media. We enumerate few :—

1. Solution of sulphate of quinine.
2. Solution of aesculin,
3. Solution of fluorescein,
4. Bisulphide of carbon (Miller, "Phil. Trans.", 1862, p. 861).
5. Petroleum.
6. Solutions of nitrates of alkalies. (Ervera, Eder's "Jahrbuch," 1900, p. 22).
7. Various kinds of glass, especially uranium glass, &c.¹²

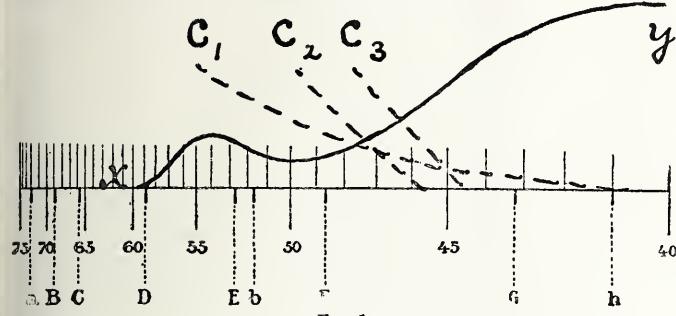


FIG. 1.

There is an exceptionally comprehensive literature relating to compensating filters. For nearly every one of the numerous organic yellow yes some special preference is claimed. I give the names of some which are more especially recommended :—

Acridin yellow, auramin O, aurantia, aurin, brilliant yellow, chrysoidin, methyl-orange and methyl-orange, martius yellow, picric acid and alts, primulin, tropolin, Victoria yellow. (As a handy guide to the organic dyestuffs, see "Tabellarische Uebersicht über die künstl. org. Farbstoffe," Schultz and Julius, and Formanek's "Spectralanalytischer Nachweis künstl. org. Farbstoffe," Berlin, 1900).

Among the inorganic media, special mention should be made of the use of solutions of bichromate.

Ready-made yellow screens, yellow glass, &c., have been sold commercially for some time. C. Zeiss, of Jena, supplies them in three shades.

Cadett and Neall, Ashtead, Surrey, supply screens of two shades for their spectrum plates. The "Absolutus," or darker screen, gives the nearest possible correct rendering, whilst for shorter exposures the "Givus," or planer screen, is supplied, but is less correct.

Compensating filters are used for the reproduction of paintings, landscapes, portraits,¹³ and scientific purposes (spectrum photographs, &c.).

Several filters may be used in combination, viz. :—

1. Simultaneously in superposition (subtractive combination).
2. Successively (additive combination).

Both methods have been recommended for purposes of compensation. Burchett¹⁴ combines green and yellow, as a subtractive method, in front of and behind the lens. Vidal¹⁵ and Hruza¹⁶ use additive combination by changing the filter. It is evident that the field for combination is very extensive.

4. CONTRAST FILTERS.

If certain colours of the object are to be brought out and accentuated in the photograph, a filter complementary to it in colour must be selected. This is called a contrast filter.

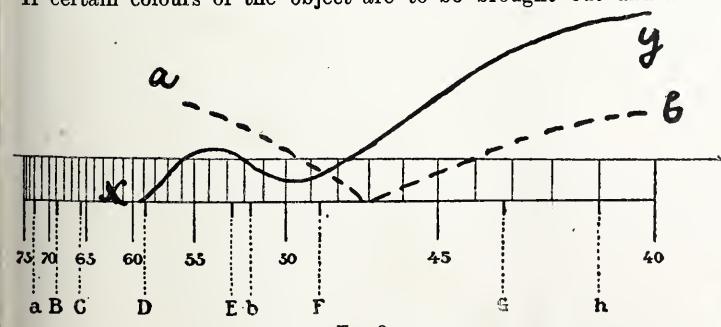


FIG. 2.

tuated in the photograph, a filter complementary to it in colour must be selected. This is called a contrast filter.

¹² Eder's "Handbuch," i. p. 281.

¹³ Bergheim recommends yellow studio blinds. Eder's "Jahrbuch," 1897, p. 303.

¹⁴ Eder's "Jahrbuch," 1895, p. 382.

¹⁵ Eder's "Jahrbuch," 1891, p. 437. Duchouchois, ib., 1895, p. 437.

¹⁶ Eder's "Jahrbuch," 1894, p. 53. Hruza combines in a cumbersome way three selective filters. See following reference.

These are mostly used in micro-photography, where very delicately-coloured objects frequently present themselves, and they are likewise used in photographing clouds, when the blue sky has to be shown as a black background.

Fig. 2 shows the action of a contrast filter, combined with the process, x, y, the curve of transmission of the colour to the contrasted being b.

The literature of contrast filters is also exceptionally comprehensive. The discussion constantly turns upon the point indicated above.¹⁷

5. MONOCHROMATIC FILTERS.

In the strict acceptation of the word there are no monochromatic filters, but for the sake of simplicity filters have been so called that only transmit very narrow bands of the spectrum. According to the process used, very different filters will exhibit the same monochromatic action.

Monochromatic filters are mostly used for photographing with lenses forming a chromatic image (micro-photography,¹⁸ astro-photography, &c.).

We enumerate some of the most important filters :—

1. Ultra-violet. This would be valuable for many purposes (Schumann), but none yet recognised.

2. Violet Zettnow, iodide of copper, Eder's "Jahrbuch," 1893, p. 262; Gifford, methyl-violet + gentian violet + blue glass; methyl-green + blue glass, Eder's "Jahrbuch," 1896, p. 303.

3. Blue. Fehling's solution, ammonio-oxide of copper. In 1888 Lohse did not know of any blue filter that did not simultaneously transmit red, and concluded it was theoretically impossible to make one. Now many such are known.

4. Green. Zettnow, chromate of copper filter, Centralblatt für Bact., &c., 188, p. 51; Gifford, benzaldehyde green + picric acid, Eder's "Jahrbuch," 1895, p. 217.

5. Red. Zettnow, oxide of copper glass, "Phot. Corr." 1889, July. Nagel gives a complete list in the "Biol. Centralblatt," xviii. p. 649.

This short statement shows how extensively the subtractive combination filters have been explored. Their use is of much value for the transmission of small bands of the spectrum. Landolt¹⁹ makes extensive use of this method of polarimetric purpose.

6. PROTECTIVE FILTERS.

Protective filters are used for regulating the light of rooms where preparations have to be preserved from the action of light. Such filters, generally speaking, should only transmit light which has no effect upon the preparations in question, or only affects them after

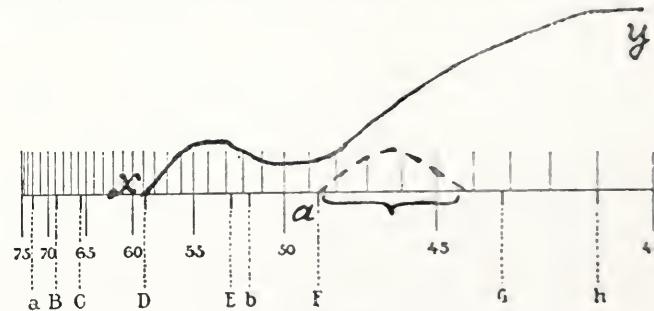


FIG. 3.

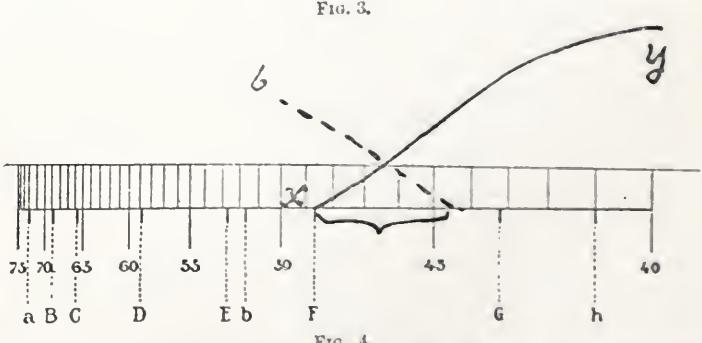


FIG. 4.

exposure for a considerable length of time. The colour of the filter should therefore be complementary to the actinic colours.

¹⁷ Exhaustively treated by W. Gebhardt, "Phot. Rundschau," xiii. p. 43. "Intern. Phot. Monatschrift," vi pp. 49, 73, 95, 113.

¹⁸ See Neuhauss, "Lehrbuch der Micro-Photographie," 2nd ed., pp. 66 to 74.

¹⁹ Method of determining rotary dispersion by means of light filters. "Ber. der deutsch. chem. Ges," vol. xxvii pp. 2872 to 2887.

For most printing processes very pale yellow filters suffice; for Daguerreotype and the albumen process, the filter should be deeper; for the wet-collodion process, a pale orange filter; for the ordinary dry process, a deep orange filter; for the ordinary orthochromatic plate, a red filter; for Lumière's panchromatic plates, a dark-green filter. Cadett's spectrum plates (deep red) should only be exposed to the extreme red.

Cadett offers commercially "safe glasses," which are a subtractive combination of several dyestuffs.

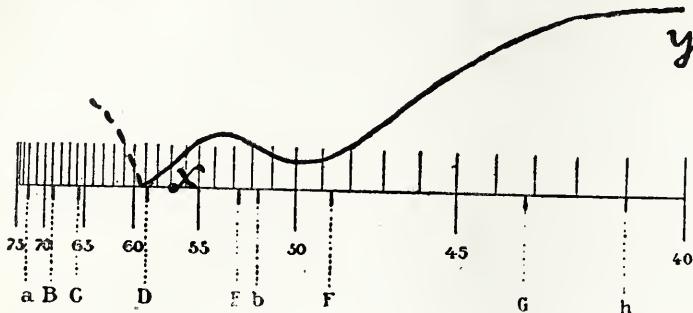


FIG. 5

Fig. 5 shows the action of a protective filter in the case of process *x y*.

Much has also been written upon this subject.

As subtractive combinations H. W. Vogel has recommended massive copper ruby + gold ruby glass; Miethé²⁰ copper ruby + cobalt glass.

7. SELECTIVE FILTERS.

Combination filters, used in the indirect method of composite colour photography are called selective filters. Their purpose is for the selection of certain groups of colour from the object to be photographed. This process is called optical colour selection²¹ (analysis, separation of colours, decomposition), in contradistinction to manual colour selection, which has been much used since Le Blon's investigations. Selection is generally supplemented by the second process of optical synthesis (colour reconstruction), the object of which is to reproduce the colour of the object as correctly as possible.

The optical synthesis may be done by two independent methods of admixture:—

1. The additive method of admixture (actual light mixture). The primary colour system of the three-colour synthesis, red, green, and blue-violet.

2. Subtractive method of admixture (mixture of colour substances). The primary colour system of the three-colour plates: pale blue, purple, and yellow.

The various synthetical processes are already mentioned under the visual light filters.

The history of optical colour selection has been traced back as far as the year 1861.

The English physicist, James Clerk-Maxwell, made the following statement on May 17, 1861, in a paper read before the Royal Institution:—

"Three photographs of a coloured ribbon, taken through the three coloured solutions respectively (three glass troughs, containing, respectively, sulphocyanide of iron, chloride of copper, and ammoniated copper), were introduced into the lantern, giving images representing the red, the green, and the blue parts separately. When these were superposed, a coloured image was seen, which, if the red and green images had been as fully photographed as the blue, would have been a truly coloured image of the ribbon. By finding photographic materials more sensitive to the less refrangible rays, the representation of the colours of the objects might be greatly improved."²²

Twelve years passed before anything more was done in the direction of solving the problem enunciated by Maxwell. Meanwhile others occupied themselves with the process of selection set out by Maxwell.

The English miniature painter, Collen²³ and Baron Ransonnet,²⁴ of Vienna, in 1865, selected red, yellow, and blue filters, but worked upon Brewster's incorrect theory of the three physical primary colours.

²⁰ Eder's "Jahrbuch," 1895, p. 380. For complete information concerning dark-room illumination, see Baynton, "Process Photogram," 1900, p. 142.

²¹ In France, trichromatic photography is called "triple selection." Monillard, "Bull. Soc. Franc," 1898, p. 535.

²² Proceedings of the Royal Inst., "British Journal," 1861, p. 270.

²³ "Brit. Journ. of Phot.," 1865, p. 547.

²⁴ "Photo Corresp.," 1860, p. 199.

Ducos du Hauron²⁵ in 1868, Cros²⁶ in 1869, and Husnik²⁷ in 1870, on the other hand, used Maxwell's filters, red, green, and violet, which correspond with the Young-Helmholtz theory of the three primary sensations, which was Maxwell's starting-point. Maxwell's synthetic method was additive (tri-chromatic projection), but he also indicated the possibility of the subtractive method upon paper (three-colour printing). The work of Collen, Ransonnet, Ducos du Hauron, Cros, and Husnik was, on the other hand, principally in the direction of the subtractive method of synthesis.

DR. GREBE, Jena.

(To be continued.)

BELGIUM—A RETROSPECT.

IV.

Most Flemish cities at intervals manufacture a festival or carnival in honour of some departed worthy, and Bruges is no exception. In 1884 they had a particularly grand show in remembrance of Charles le Bon. The procession was about a mile long, and must have taken an immense amount of trouble to arrange. Unfortunately the first day the cortège perambulated the city the weather was unpropitious, and I am afraid several of the chief performers had an uncomfortable time of it. Two days afterwards the procession was to go over the same route again, and at some inconvenience I went to Bruges and engaged a window in the Grande Place, just where I thought I could get some satisfactory pictures of this unusual festival. The time came. I was all fixed up at the window ready. The band was heard in the distance, and the procession entered the square, only on this occasion, for some unexplained reason, it passed across on the opposite side of it. The waiting crowd easily accommodated themselves to the circumstances by rushing across the large open space, while I—well, I packed up and paid for the window with the best grace I could assume under the trying circumstances.

The interior of St. Sauveur was beautifully decorated for the festival, and I was very desirous of getting a plate of it. I was informed that the only time it could be done was while the priests changed their robes after the first portion of the procession. I arranged to give a certain signal at one of the small doors, and if all was clear the verger promised to let me in. I arrived at the time stated, and gave the signal. The verger stealthily opened the door, and I lost no time in getting to work. After a few minutes a small bell rang, and I had to "clear out." I had got what I wanted, however (so had the verger), and felt to a certain extent compensated for my disappointment in the square.

I might here mention that among the annual festivals in Belgium perhaps the most noteworthy is the great procession of "Notre Dame," which takes place in Antwerp on the Sunday following August 15. Years ago it took place on that date. It was looked upon at that time as an ordinary occurrence, and attracted few beyond the townspeople; then there was little difficulty in obtaining satisfactory photographs of the procession from any window en route, or even near the altar in the Place de Meir. Now this festival is more noised abroad; immense numbers visit the city on the occasion; every coign of vantage is crammed with sightseers, and two years ago a friend of mine counted 90 cameras in and around the Place de Meir.

From Liège the next halt is usually Ostend. If any class of school children were asked what this port was noted for, the answer would most likely be "Rabbits." If the question were asked of a lady who had been there, the reply would probably be, "Varieties in bathing costumes." If the inquiry were made of the father of a family of grown-up daughters, who had spent the season on the Digue, he might reply, "The number of times it is possible for a lady to change her costume between the hours of ten and five o'clock." With the reply of the children, I'm afraid I could not agree, as I have never seen a rabbit in Ostend; but the other answers I should regard as tolerably right, and it may therefore be taken for granted that Ostend is (during the season) a place where the snapshotter will find plenty of opportunity for getting through his stock of plates.

The difference in the state of Ostend in season and out of season can only be understood by those who have seen it under both conditions; and when Mr. Traill Taylor and I were there, in the early October of 1889, my companion could scarcely credit this was the place of whose festivities he had heard so much. We had arranged

²⁵ Privileg. 23 Nov., 1868, No. 83,061. Eder's "Handbuch," vol. 8, p. 443.

²⁶ "Les Mondes," 1869.

²⁷ "Phot. Mittb." 1870, p. 2, and "Phot. Corresp.," 1878, p. 1.

to spend our last day here, and a quiet day it undoubtedly was; that is if the wind were left out of consideration. The Digue, which only a few days before had been all gaiety, was now deserted. Well I remember standing under the shelter of the Kursaal while my genial friend discoursed on Yankee experiences, and warbled the old American revival song—

"Roll, Jordan, Roll;
Oh, Brudder, you ought to be dere,
A-sittin' in de Kingdom,
To hear Jordan Roll."

We had arranged to leave Ostend next morning by the early boat (5 a.m.), but by that time the wind had increased to a gale, and we decided to postpone our departure until 10.45, on the chance of better weather. After breakfast the wind had moderated a little, and, as I had an important engagement in London that evening, there was no alternative but to risk it, and on board we went. It poured in torrents, and the sky was black with angry-looking clouds. It was the worst crossing I ever experienced, and the boat arrived at Dover so much behind time that all hand luggage (such as ours) was allowed to pass unexamined by the Customs. We were just settling down comfortably in the carriage as the train steamed out of Dover when I noticed a sorrowful expression on the face of my companion. "Ah, lad!" said he, "if I had only known our luggage would not have been examined, I'd have brought over another couple of pounds of that 'American cake tobacco.'"

We arrived in London only just in time for my appointment, and, although the sea between Ostend and Dover had treated us "the north side of friendly," I always look back upon that tour as one of the most enjoyable I ever spent in Belgium.

I have occupied so much space with the attractions of Antwerp, Brussels, Bruges, Ghent, and Malines that I am afraid I shall have to group many other places, interesting both historically and photographically. Those of my readers who have time will do well to visit Louvain, with its richly-decorated fifteenth century Town Hall; Liège, with its many churches, statues, gun and sword factories, and vast iron works founded by John Cockerill, occupying nearly 300 acres of ground, and employing about 10,000 hands; Chaudfontaine, with its charming views; Namur, with its excursion down the Meuse (a river in many respects equal to the Rhine) to Dinant, with its market place; Roche Bayard, Anserenne, Chateaux Walzin, and Freyer; Hastiere, and the grottoes of Rochefort and Han; Huy, with its fine old gateway; and several villages between Namur and Dinant, where a most enjoyable time may be spent at a comparatively trifling cost.

Innumerable snapshots may be obtained everywhere, and the little carts drawn by dogs are all over the country. In many districts the wooden shoes are being gradually displaced in favour of leather, but, in the majority of the villages, more especially on the Dutch side, the sabots, white caps, and bright brass milk cans are still to be found as of old.

There is one thing in which the Belgians are as bad as the English. They allow advertising boards by the sides of the railway lines, and even in some cases the sides of the cottages are painted with gaudy advertisements. In our photographic journals from time to time we see complaints of "disfiguring the landscape" by such malpractices. But I wonder what would happen if some of those who cry out on this subject became possessed of eligible property where these eyesores already existed? Would they remove them; or would the complaints of "disfiguring the landscape" cease?

In the old days the Belgians were contented with their own time, and it was a little awkward to find you had gained 20 minutes on the journey. Now Greenwich time is used on all the railways there, which greatly facilitates matters, although their time-tables with trains from 1 minute past 0 to 59 minutes past 23 are a little confusing until you get used to them.

Were I to relate all the odd experiences I have had among the French-Flemish people I should occupy more space than is at my disposal. Latterly, I have heard of English tourists not having been treated courteously in Belgium, and this may, of course, be true, as I am rather sorry to see that a misguided few of King Leopold's subjects are forgetting the terms of a certain treaty signed in London in November, 1831, and do not seem fully to understand the meaning of the word neutrality. Still, the little mistakes of a handful of discontented people must not be taken as a fair sample of a nation. Personally, I have always received at the hands of the Belgians the

greatest courtesy and consideration, and I am sure I can promise the same treatment to any one else, who during his visit abstains from discussing political and religious matters, recognises that it is quite possible for an Englishman to be a foreigner, and that the possession of a thirty shilling tourist ticket does not entitle the holder to "boss" the country.

Finally, if any of your readers think of going to Belgium, I hope they will not allow the photographs which appear in some of our English railway carriages to upset their plans. These illustrations are intended to act as an inducement to would-be tourists, and many of them are excellent. But, had Belgium not been more attractive than some of these smudges represent it, this article would never have been written.

F. A. BRIDGE.

THE NEW AMERICAN SCHOOL FROM AN AMERICAN PHOTOGRAPHIC POINT OF VIEW.

WRITING of the recently-held Exhibition of the Philadelphia Photographic Salon, our contemporary "Anthony's Bulletin" remarks that those who rule the destinies of "high-art" photography in America have sat in solemn council and have chosen some 120 prints as worthy of being admitted to public view; a number of photographers whose qualifications are beyond cavil, or who do not approve of being judged, have contributed almost as many more; and these 204 photographs, hung in the gallery of the Philadelphia Academy of Fine Arts, constitute the third Philadelphia Photographic Salon.

Much has been said, proceeds the article, as to the wonderful advance which has been made by these men, as compared with the professional photographers of America; and this Exhibition affords an opportunity of judging the value of the statements made.

Of the 200 prints exhibited, only 80 can, by any stretch of courtesy, be called portraits, the remainder are figure studies or outdoor scenes. From these 80 we can learn the strength and the weakness of the new school.

These advanced workers evidently prefer revolution to evolution, and in endeavouring to create an "art" have succeeded in creating an extreme, and at times a crazy, fashion. They have decided that professional photography is beyond salvation, and have never discovered that its salvation has actually been achieved—and from within. It is so very easy—flippantly easy—to find cause for fault, and those who have condemned the professional photographer have no excuse except crass ignorance. There are lots of bad professional work—but there is good. And there is much good. The idea that professional photography is "bad" has led these workers into strange blunders. They have gone on the idea that the reverse of bad must be good, and that therefore, if their work is totally unlike the usual thing, why, then it must be "artistic." Therefore, as cardinal sins in a photograph are likeness, and clearness, and detail, and retouching, they get rid of these. Never mind about likeness; instead of calling it a portrait, it can be termed a "study," and will be the better for it. Clearness and detail, with half a dozen other possible beauties, are sacrificed at one fell swoop by the choice of a paper. By sensitising his own paper the photographer can get any degree of roughness or texture or colour for his support. By the use of gum bichromate he can get any extreme of granularity or indistinctness. So we have little prints, not larger than a cabinet, formed of such big splotches of gum that three of them will make a nose, or a dozen of them will cover a face. It is no question of being critical; it is a simple impossibility to escape from the texture. Step back from the photograph, as though it were a fragment of a great enlargement, and the grain follows you as far as you can see any meaning in the picture. We hear of brush development; subordinate detail, so that the "motif" of a picture can be seen. Motif! save the mark! They give us pictures with an eye and a nose, a forehead and a chin. The mouth is a smudge of black; and sometimes, too, the eye. The hair and background and coat are all one vast mass of daub. The hair blends into the background, and there is no suggestion of any dividing line. It is mounted on a patch of brown wrapping paper to make a mat a quarter inch all round the picture, and this mat is in turn mounted on a much larger one of some green or grey tint. A fancy signature is appended, and maybe it is framed.

To speak plainly, it is so very, very easy to make an "artistic" picture. A print is made, from an execrable negative, and the artist fakes, and dabbles, and restrains, and coaxes; and at last he has got some-

thing. He did not know exactly what he was after; but he knew he was after "something." And by the time he has got it he has pored so long over it that really he does not know how to judge it. So it is mounted, and some kindred soul comes along and says, "I like that; it appeals to me"—and off it goes to the Salon and to fame.

There is good work at the Salon; work which is sound photography and good art. And there is work that would give hints in pose, &c., to the wide-awake professional. But any one, from a dozen of our leading photographers, could choose six—or twenty—of his best portraits, and they would hold their own—and more—with the best of the Salon work. Francis Watts Lee has two lovely things, one of them a portrait of two little sisters. Miss Watson—whose work is all good—shows one of the daintiest and most delicate—withal strong—heads that photography has produced. The "Portrait of a Baby" by Alfred Stieglitz is a delightful bit; and he has one of a mother and child looking out of a window, which should gladden the heart of any photographer who can appreciate a good thing.

A longer list could be made of the bad work than of the good. But the good—from two or three workers—is very good, and that because they are not in the immature stage of revolt against "photographic quality." But the chief hope for the new school is in its utter weakness. So much has it gone off the track that it will only save itself from utter grief by a thorough recantation. It has been said—and hoped—that the amateur would raise the level of the best professional work. He must, instead, if he would live, reap his wild oats by a course of humble discipleship under the leaders of the men he has despised.

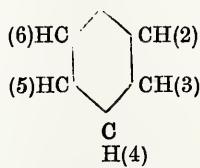
PHOTOGRAPHIC DEVELOPERS.

[A Paper read before the Andersonian Chemical Society in the Glasgow and West of Scotland Technical College.]

THE number of photographic developers is nowadays so great that a proper knowledge of their properties and suitability for various processes requires a long practical acquaintance with them. The knowledge of their chemical constitution and properties is of great assistance in the proper understanding of the action of developers and their application. The behaviour of a developer is in some way connected with its constitution, though at present it is not very well understood. A developer consists of two amido (NH_2), or two hydroxy (HO), or an amido and a hydroxy group at least united in a certain way. They may be quite simple, as in hydrazine (NH_2NH_2), or hydroxylamine (NH_2HO), or hydroxyl (HOHO). They may be united by benzene, or a benzene derivative, in which case they displace one of the hydrogen atoms. They must also be in the ortho or para relation



to each other. In this benzene ring (6) HC



atoms, 1 and 2, are in the ortho, and 3 in the meto, and 1 and 4 are in the para relationship. When they are in the meta relationship the substance does not develop. In naphthaline derivatives it is not known whether meta compounds are developers or not. In benzene compounds the groups must be joined to the same nucleus as in diamido oxydiphenyl ($\text{NH}_2\text{C}_6\text{H}_4\text{C}_6\text{H}_3\text{NH}_2$). In this compound the first amido

compound takes no part in the developing action. The association of the benzene nuclei in naphthaline is more intimate than in diphenyl, thus it is that the groups in the case of naphthaline need not be in the developers, and are not much used as such. The amido group works well in conjunction with a hydroxy group, and some of the most powerful developers consist of benzene derivatives having such compounds. The substitution of hydrogen atoms of the amido groups by alkyl radicles, such as CH_3 and C_2H_5 , has given some very useful and powerful developers. Such substitution produces compounds like

dimethyl-phenylene-diamine $\text{C}_6\text{H}_4\left(\begin{array}{c} \text{NCH}_3 \\ | \\ \text{CH}_3 \\ | \\ \text{NH}_2 \end{array}\right)_2$ and dimethyl-para-amido-phenol $\text{C}_6\text{H}_4\left(\begin{array}{c} \text{NCH}_3 \\ | \\ \text{CH}_3 \\ | \\ \text{OH} \end{array}\right)_2$. These derivatives are easily oxidised, and are

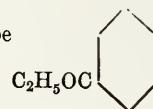
good developers. When the hydrogen of the hydroxyl group is replaced by an alkyl radicle developing power is destroyed. Thus quinol

monoethyl ether $\text{C}_6\text{H}_4\left(\begin{array}{c} \text{OH}(1) \\ | \\ \text{OC}_2\text{H}_5(4) \end{array}\right)$ does not develop. If one of the groups, whether amido or hydroxy, be in the side chain of a benzene derivative, the substance possesses no developing power. Such a com-

ound is represented in para-amido-phenol $\text{C}_6\text{H}_4\left(\begin{array}{c} \text{NH}_2 \\ | \\ \text{C} \\ | \\ \text{OH} \\ | \\ \text{CH}_3 \end{array}\right)$. The

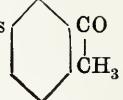
presence of a carboxylic group (COOH) in the benzene nucleus destroys developing power, even when it is neutralised by powerful alkalies, but when it is etherised the substance becomes a developer. Such a

compound would be



has very little effect on the developing power, but it greatly increases the solubility of the developer in water, the influence of the ketonic group ($=\text{CO}$) is rather curious. In simple

phenols, as



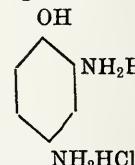
tive is an exception to the general law. The ketonic group may unite a developing benzene derivative to another body, and, if this other body has no hydroxy groups, the compound possesses developing power, but if a hydroxy group be introduced into what may be called a side chain developing power is destroyed. The developing power of a benzene derivative cannot thus be increased by the joining to it of another derivative which has developing power.

The addition of another amido group to a hydroxy-amido developer increases the developing power, but is liable to cause the developer to become slow in action towards the end of development. This is supposed to be due to production of secondary amines which neutralise the effect of the rest of the developer. Tri-amido-phenol and tetra-amido-phenol, which should be very powerful developers, are comparatively useless for this reason. Tri-amido-phenol will work, however, in conjunction with mono-sodium phosphate and sodium sulphite. This is probably due to the acidic character of mono-sodium phosphate.

One wonders why such simple developers as hydrazine, hydroxylamine, and hydroxyl are not used. This is because the first two liberate nitrogen, while hydroxyl liberates oxygen. These gases cause the bubbles to swell off in small blisters. It is curious that hydroxyl, which is a powerful oxidiser, here plays the part of a reducing agent. Hydroxyl is known to reduce silver oxide with the liberation of oxygen.

I am enabled, by the kindness of Messrs. A. & M. Zimmermann, the agents of the Actien-Gesellschaft für Anilinfabrikation, to exhibit specimens of developers which I will proceed to describe. Amidol or hydro-

chloride of diamido-phenol



occurs as sparkling white crystals, which gradually blacken. It is easily soluble in water, and is used in conjunction with sodium sulphite and potassium bromide. The addition of alkalies is not necessary. It gives an image of a splendid blue-black tone. It develops rapidly at first, but soon slows down, and then works very slowly, giving poor density in plates. For this reason it is only used for bromide papers, and is probably the best for this purpose. Its disadvantage is that it will not keep more than a few days. Metol or sulphate of methyl para-amido-phenol occurs as a crystalline powder. Easily soluble in water, it is used in conjunction with NO_2SO_3 , with alkali carbonates as accelerators. It is a fairly powerful developer, and is well suited for under-exposures. The image comes up very quickly, and density is built up better than with amidol. Ortol or sulphate of methyl-ortho-amido-phenol is similar to metol, only that it is less powerful. It does not oxidise so readily. The same solution may be used over again. I have heard of 48 successive plates being developed in the same solution. A modification of hydroquinone is sold under the name of hydroquinone Br.



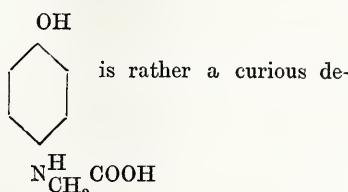
Its formula is



It is extremely free from fogging in its

action, and is admirably adapted for the development of over-exposed plates.

Glycin or para-oxyphenyl-glycin



is rather a curious de-

veloper. The peculiarity of it is its very low power. At first sight it should appear slightly more powerful than para-amido-phenol, but it has only about a third the power of that body. This is because it is properly glycine ($\text{NH}_3\text{CH}_2\text{COOH}$), in which one of the hydrogen atoms has been replaced by a molecule of phenol. Glycin is very soluble in water, giving an acid solution which keeps well. It is very free from stain.

Dianine is diamido-resorcin, which I have described. Rodinal is the sodium salt of para-amido-phenol dissolved in a concentrated solution of sodium sulphite. It keeps very well, and is convenient in use, simply requiring dilution. It is the most powerful developer known, and is about the best for extreme under-exposure. After having tried this developer one is not inclined to develop under-exposures for two hours with a pyro-ammonia developer of strength one quarter-grain per ounce when the same result is got in twenty minutes with rodinal.

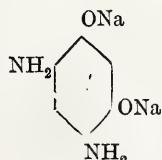
Eikonogen is a developer that has gone much out of fashion, probably because the large amount of 3.5 per cent. in the developer clashes with the average amateur's idea of thrift. This developer is an excellent one for slight under-exposures, and can conveniently be used in a single solution.

Hydroquinone and para-phenyl-endiamine unite in molecular proportion to form brilliant scales slightly soluble in cold water. It is sold under the name of hydramine. It works very slowly as a developer in the ordinary way, but the addition of caustic lithia in a small quantity enormously increases its speed. It is extremely sensitive to the restraining action of potassium bromide. It will develop until the solution is completely exhausted of developer. It requires less sulphite than other developers. Owing to the small quantity of salts in the developing solution the frilling of the gelatine is greatly mitigated.

I have here a sample from Messrs. John J. Griffin and Sons of a dihydroxyl developer sold under the name of kachin, and otherwise known as pyrocatechin or catechol. This developer has slightly less power than hydroquinone, and has to be used in a larger quantity in the developer. It is not so easily oxidised, and is very clean in working. I have here a negative developed with kachin, and you will see the blackness of the image. It has made a very flat scene into a passable photograph. Borax restrains this developer better than KBr. It is curious that borax acts as a restrainer with some developers, while with others it acts as an accelerator. This is noticed with pyrogallol. The reason is borax combines with certain polyhydric alcohols forming energetic conjugated acids. No such action takes place with quinol, eikonogen, or hydroxylamine-hydrochloride, in which case it acts as an accelerator.

Kachin is the only developer that sodium thiosulphite has no restraining action upon, and it may be added to the developing solution in sufficient strength to fix the plate simultaneously with development.

Resorcin is well known not to be possessed of developing power, but when amido groups are introduced, and suitably arranged, it becomes a very useful developer. Diamido-resorcin (2,4) used in a 1 per cent. solution, with 3 per cent. of sodium sulphite anhydrous, as a developer. It gives very good results. The graduations are even, and the image is clear. The addition of sodium carbonate raised the speed, but not the power. The best is 8 per cent., which is a little in excess of that required to form the theoretical compound:—



In conclusion, I may say I believe that any substance is a developer which is capable on oxidation with silver bromide, especially if it has been exposed to light, forming a quinone-like compound, and the ease with which this takes place, especially in the presence of retarding agents, is a measure of the power of the developer.

ALEXANDER D. LEIPPER.

SOME NOTES ON INTENSIFICATION.

It is curious, even among those who have learned their technical work pretty thoroughly, occasions arise, when developing plates, where, for one or other reason, it becomes difficult to obtain full printing density without risking the introduction of other, and worse, evils.

Small wonder is it those less experienced find this obtaining uniformity of density difficult, if not, indeed, impossible, the main trouble in their case being the plates are not allowed to remain in the developing solution for sufficient time, with the result, after fixation has taken place, what had seemed likely to prove fairly vigorous images turn out but ghostly affairs.

Often enough over-exposure in the hands of a beginner is another cause of unduly thin negatives, unless means are taken at the outset to guard against it.

There can be no doubt to take such steps as may be required for the rectifying of errors in exposure during development is better than having to depend upon any after process, either of intensification or reduction.

Yet, easy as it appears to so adjust development as to nullify any errors, there are numerous occasions when negatives suffer from want of intensity, and in such instances it is well to try improvements.

When development has simply been stopped at too early a stage, the image presents a thin, delicate appearance, free from veil or fog. With such a plate a ready mode of strengthening it is to employ the uranium intensifier.

Before treating with this, or, indeed, most other forms of intensification, the plate should be first subjected to a thorough and effective washing, which, if possible, ought to take place in running water; failing this, changes are made at frequent intervals.

If this is not done, and practically the last trace of hypo eliminated, stains follow, and the negative, instead of being improved, is ruined.

Assuming thorough washing to have taken place, immersion for such time as necessary in a solution made up of—

Potassium ferricyanide	1 part.
Uranium nitrate	1 part.
Glacial acetic acid	10 parts.
Water	100 parts.

will result in a change of colour, and at the same time the image is bodily strengthened.

When sufficient intensification is judged to have taken place, the plate is bathed in a dilute solution of acetic acid in water, then washed for a short while, dried, and is ready for printing from.

This is a useful method, because, should the result not prove satisfactory, soaking in weak solution of ammoniated water restores it to its original condition.

Again, if but some portion needs additional density, it is so simple a matter to clear away the uranium deposit where not required.

To do this so that no markings shall show needs time spent over it, and plenty of water used to keep the edges softly defined. With care radical alterations may undoubtedly be made, but one cannot help feeling better means are available, either chemical or by stumping with lead or chalk powder.

Uranium, as a means of intensification, is perhaps of most service where the additional density is only required for temporary purposes, as when a negative has purposely been made thin for some particular printing process, bromide or C.C. platinotype paper, for instance, and it is desired to print from it in a medium, such as carbon or rough silver paper, for a time: then the addition light-resisting property is rapidly given by means of this salt, and as rapidly removed when necessity for it has been fulfilled.

Among more permanent means to the same end is that of first bleaching the image in a saturated solution of bichloride of mercury, to each ounce of which should be added one minim of hydrochloric acid, the function of the acid being to prevent any formation of prejudicial compounds.

The plate is then thoroughly washed, and afterwards developed, in daylight, with the following:—

A. Saturated solution of ferrous sulphate.

B. Saturated solution of potassium oxalate.

These are mixed in the usual proportion of one part A poured into four parts of B.

After the image is sufficiently redeveloped, it is washed for a time, then subjected to a dilute bath of hydrochloric or citric acid, again well washed, and dried.

The above method is recommended by Mr. Chapman Jones, and perhaps no better authority upon intensification and kindred work exists.

There is one matter well to attend to in commencing such treatment of gelatine plates which have been dried, namely, to thoroughly soak them in clean water, preferably such as has been boiled, otherwise at times a curious reticulation of the film is liable to take place; why, is not so clear, but in practice this trouble does not appear when a preliminary soaking in water has been given.

Many negatives one sees, especially those produced on very rapid

plates, which have had shutter exposures, as when doing hand-camera work, require not only general intensification, but their shadows clearing; in other words, reduction first, followed by intensification.

In such instances, as ready and effective means as any is Howard Farmer's ferridcyanide and hypo, seeing that it is absolutely under control, and may be applied so soon as the plate comes from the fixing bath, and slight clearing up of the shadows is found necessary.

A good washing follows. Then either the plate is dried and intensified at some convenient time, or it may be proceeded with the moment all traces of hypo have been got rid of.

For several reasons it is better, however, to defer this part of the operation, one being, a film of gelatine, undergoing such treatment, becomes exceedingly tender and liable to blister or frill; and yet a further reason, one can better judge the degree of additional density required when examining a plate in a dry condition, its appearance while wet often proving deceptive. It would serve no useful purpose to give but a tithe of the formulæ for intensifying which have appeared from time to time, but one which will give admirable results is that known as the copper process.

The plates being first bleached in the following:—

Sulphate of copper	2 drachms.
Ammonium bromide	½ oz.
Water	10 oz.

When it appears thoroughly white all over, and right through at the back, wash and develop in daylight by means of any developing agent conveniently at hand. On completion, another and thorough washing follows, and after drying the negative is ready for use.

To many who may dislike using mercury, on account of its highly poisonous nature, the copper method of arriving at the same result may prove useful, for it answers perfectly.

So far, consideration has been given to the general intensification of original negatives by chemical means; but, where a little time and trouble is not objected to, it seems a pity, instead of so often trying to patch up a thin, flat image, the end is not obtained by reproduction, it simply means making a transparency on a slow plate, and from that another negative, either through the camera or by contact. By so doing all danger of spoiling the original plate is avoided. Nor have any deadly poisonous chemicals to be handled, while the control one has over the final result is far less restricted, for it may be made pretty much what is desired in regard to contrast and general density.

Many years ago, having exposed a rapid plate, and grossly overdone it, development in due time followed. At that period, being but young in the practice of photography, a normal developer was poured over the plate, and, of course, with the usual effect—the whole image flashed out, and rapidly began to veil. Being little more than a novice, and somewhat terror-stricken at the pet picture behaving in such fashion, the plate made a premature acquaintance with a strong hypo bath, the effect of which may be imagined. Instead of a negative of respectable appearance and density, a muddy-coloured ghost was all that remained to reward the time and money spent in obtaining models, posing them, then going through the needful manipulations of exposing, and so forth.

Time and time again was an attempt made to get some sort of a print from it, but without success, and it remained for years a silent reminder of the folly of commencing photography by using the most sensitive plate obtainable.

Circumstances arose necessitating a clearance being made of all lumber. Among other things, some 200 old negatives had to go, one of them being the particular one mentioned above. Perhaps it was a recollection of the wild hopes it had dashed to the ground which caused its being kept, and a trial made to get a printable negative from it. Any way, a few days later, when making some slides, it was placed in the camera, and a lantern slide received such part of its image as seemed worth keeping. Considering its extreme lack of density a full exposure was given, then development done with strongly-restrained hydroquinone; the result, a slide full of detail, right through from shadow to high light, and of ample density, which afterwards allowed a 12 x 10 enlarged negative being made in the ordinary way.

Where, for special reasons, the defective original may be important and impossible of rectification by other than after-treatment, this method of reproduction seems more safe, and by no means less expeditious, than attempting it by direct treatment on the original negative itself.

Some plates require selective intensification, that is, either the high lights need forcing or the reverse.

In the former condition considerable improvement seems to ensue by taking advantage of light action on bichromate, followed by soaking in a suitable aniline dye.

The gelatine film of a negative is more or less capable of absorption, to greater degree in those portions lightly charged with silver, and less so where partially holding the heaviest deposits. If, therefore, the shadows may be rendered insoluble, the half-tones partially so, the high lights left capable of fully absorbing matter, it follows a striking variation may be brought about if the whole film be subjected to a *non-actinic colored solution*. For then what takes place is that greater

absorption ensues just where most needed, viz., in the high lights, to a lesser degree in the lower tones, and practically none in the shadows; this being brought about by first subjecting the negative to a bath of bichromate of potassium for a few minutes, at a strength of 1 drachm of the salt dissolved in 4 oz. of water, after which the plate is dried in the dark, but laid flat, instead of standing in a rack.

When dry, it only remains to expose it to daylight for ten minutes or so, but through the glass, as if printing, and it is better to place some dark or black material behind it to absorb any excess light, black cloth or velvet being convenient for the purpose.

The light, acting most through the thin deposits in the shadows, renders the gelatine in those parts insoluble, the half-tones partly so, and the high lights are left practically as they were.

After washing the plate to get rid of the bichromate, it may then be soaked in some aniline dye of non-actinic colour, red or yellow, when the more soluble parts will greedily absorb the dye, those not so soluble only partially, while the deep shadows, which had been rendered totally insoluble, take up none, and remain free of the foreign colouring matter. After this treatment the plate gives a print of altogether different quality than before, the high lights having been practically intensified and the shadows left in their original condition.

At times negatives suffer from opposite evils to that just dealt with, i.e., full density in high lights, but deficient of strength in the shadows, in which state of affairs, if the absorbing qualities of gelatine be again taken advantage of, but in this instance without calling in the tanning influence of the bichromate salt, we shall have the shadow absorbing the full extent of colour, while the already fully-charged portions of the negative take up but a trifling quantity. The plate, after such treatment, will be found to render the high lights when printing practically as before, but the various steps in gradation down to the deepest point of shadow will print far less deeply, what in this instance has taken place being the deep shadows have been rendered obstructive to the passage of actinal light rays in far greater proportion to the more dense deposits, or, in other words, we have intensified the shadows to the maximum extent, while leaving the high lights in the least disturbed condition.

For amateur workers who but at lengthy intervals may need to intensify a plate or two, no more convenient way of doing it exists than to use the mercury iodide "Tabloids," which are put up in those small glass phials, for at any time a fresh bath may be made up in a moment by dissolving one tabloid in one ounce of water and placing the plate in the solution. Intensification proceeds gradually straight away, and is concluded in one operation, it being merely necessary to take it out when sufficiently dense, wash, and dry it.

This does away with any danger or trouble in keeping mercury solutions, for the bath can be poured away the moment it has done its work and a fresh one made whenever needed.

Perhaps of all methods this mercury iodide has the merit of simplicity of working most marked, the plate merely being soaked in the solution till done, and the operation of intensifying is ended, nor does there seem any reason for its being less permanent than others.

By one or other of the methods mentioned very radical alterations in the printing values of any negative may be brought about; but, after all, they are but making the best of a bad job and only prayed in aid, failing the opportunity to rephotograph the subject and remedy faults by due adjustment of exposure to development.

W. THOMAS, F.R.P.S.

NOTES FROM THE NORTH.

THE one topic not considered out of place in Glasgow at the present time is the outlook for our coming International Exhibition, and how it hurts our native vanity to discover that in London scarcely anything seems to be known about it. One of our enterprising dealers went up to the Metropolis last week to make arrangements for a specially good display at his stall in the great Show, but, to his dismay, hardly a soul had heard or knew anything about the primary object of his errand, and the odd one or two who had heard a whisper were by no means sure whether it was not a photographic exhibition on a larger scale than usual. Of course, they were prepared to listen and to assent to propositions holding out a prospect of increased trade, but it surely argues culpable carelessness that important London dealers and manufacturers of optical and photographic goods should not be aware, in detail, of such an important means of reaching the retailer and consumer as this Exhibition will afford.

Since the Czar has practically arranged to pay it a visit, its international character has been more than ever assured, and as the Exhibition, both in extent and importance, promises to be the finest ever held in this country out of London, it cannot be ignored with safety by those who would keep a grip of the home and foreign markets. While there is evidence of the indifference of British manufacturers and traders, the foreigner has been very much alive to his interests, and more is probably known about the prospects of the Exhibition in Berlin and Hamburg than in London and Manchester. Several Con-

tinental firms are already represented by special agents on the ground, and the space secured by foreign exhibitors is out of proportion to what it would have been had our own people been fuller alive to their interests. It is thus trade is wrested from us, and we are being gradually ousted out of the markets of the world. But for the enterprise of the dealer referred to, the probability is that several specialities which can more than hold their own with Continental goods would not have been brought under the notice of the great photographic community.

Photographically, the Exhibition is to "lick creation," as the Yankees say. The photographic section of the Fine Art Department is to excel anything ever seen in this or in the other hemisphere. Mr. J. Craig Annan, the convener, might not say so in these very words, but these are his sentiments, all the same. The leading professional photographers have also come well to the front in applying for space. Time alone will show whether the quarter allotted to them is the best for their purpose. There is just the slightest ground for the suspicion that, in deciding to keep their cases as far as possible in one section, the Space Committee had chiefly in view the decoration of the approach to the Grand Hall in which the concerts will be given. In any case, they are all to be together, with the exception of Mr. W. M. Warneuke, who has secured space in the covered way connecting the Industrial Hall with the Concert Hall.

The dealers' stalls are to be situated in the Industrial Hall. The design which Messrs. Rae Bros. have already in hand will be one of the most striking in the hall. It is said that Kodak, Ltd., do not intend to run a stall, considering that their ends will be adequately served by their new warehouse in Buchanan-street. An early start is to be made with the erection of Messrs. T. and R. Annan's studio inside the Exhibition grounds. The studio is to be in keeping with the general design of the buildings as a whole, and is to be put up at the entire expense of the firm.

Mr. H. C. Shelley has been down lecturing in such small towns as Coatbridge, Kirkintilloch, and Bo'ness, but he has not appeared upon a platform in Glasgow. Many have been disappointed, and surprise has been expressed that one or other of the photographic societies has not secured his services. It may be the old story of a prophet having no honour in his own country, as Mr. Shelley is too well known in Glasgow to require an introduction. He returns this way again in the spring with his Transvaal lecture, when it may be arranged to give Glasgow a chance of hearing his graphic account of his part in the prolonged campaign. I believe Edinburgh is one of the towns on his engagement list.

Weather of the most wretched description has seriously interfered with the Christmas and New-year trade both among photographers and dealers. What avails tempting show-cases and windows as brilliant as electric light can make them when, day after day, the streets are swept morning, noon, and night with wind and rain. Happily, the unpropitious weather has not diminished the gaiety of the citizens, and the lantern and cinematograph have been more in demand than ever at entertainments in private houses.

Rumour has been very persistent of late regarding the intentions of the Glasgow and West of Scotland Society in the matter of new and more commodious rooms. Certain of the office-bearers deny that there is any immediate prospect of new rooms being secured, but a sharp look-out is being kept on all likely premises. A lodging in Blythswood-square was examined a few days ago, but the figure sought was, I understand, much beyond what the Association would be prepared to face. Down Ardrossan way, the amateur photographers of clubbable tastes have been fortunate enough to rent the premises formerly occupied by a professional worker, and, with a small expenditure, have adapted them to their needs. It is not every amateur society that finds itself in possession of a studio in the second year of its existence.

Thanks to the initiative of Mr. W. J. B. Halley, Hon. Treasurer of the Glasgow and West of Scotland Amateur Association, a beginning has been made with the formation of a photographic museum. Recently a very fine collection of Daguerreotypes was offered privately for sale. Mr. Halley had first choice, and purchased five for his Society, who have had them framed in the best manner known for their effective preservation, and hung on the walls of the Association's rooms. It is the intention of Mr. Halley and his fellow office-bearers to secure examples of the progress of photography from the days of the Daguerreotype downwards. In this they are following the course pursued many years ago by Mr. William Lang, F.C.S., and one of Glasgow's most enthusiastic amateurs, in forming what is now one of the finest collections of the kind in the country. The Glasgow Corporation are gradually acquiring a photographic antiquarian collection.

The present session of the Edinburgh Photographic Society has already produced more than one paper of widespread interest. The latest of the series was delivered at the last monthly meeting by Mr. W. E. Carnegie Dickson, B.Sc., on "Photography in Medicine and Surgery." In his opening remarks he dealt with the every-day ap-

plication of photography in affording illustrations of interesting cases, medical and surgical, in which art had no place, and with the annoyance the doctor feels when his best cases turn up in the winter months. He showed how difficulties were overcome in special cases by the use of the inverting or canting table and a tall tripod. He next touched upon the value of stereo-photography in the realm of scientific investigation, and of the importance of micro-photography in the study of histology. The last part of his paper covered the use of radiography. The former custom of the surgeon was never to attempt to remove a foreign substance by an operation unless he could feel it; now it was necessary to see it. Every hospital had now its X-ray department, and the South African war had proved the immense value of the discovery in dealing with bullet wounds and fractures.

A great deal of interest is being taken in colour photography in this quarter. The transparencies which were shown at the Royal Society to illustrate the present stage of the McDonough-Joly process have been on view, and been inspected by many hundreds during the past few weeks, at the Blythswood-square studio of Mr. W. M. Warneuke. Lord Kelvin has been attracted by the process, and at the annual conversazione of the Scottish Natural History Society, at which he presided in the Balmoral Hotel, Edinburgh, on the 13th inst., Mr. Warneuke attended at his lordship's request, and gave a demonstration of the process, the transparencies which were at the Royal Society being supplemented by a much larger number, as well as by a collection of lantern slides. Disappointment having been expressed that Mr. Warneuke's studio was only open in the daytime, it is his intention to arrange a number of evening demonstrations for the convenience of those engaged during the day.

Mr. Charles Reid, of Wishaw, is among the lecturers again with his imitable collection of animal studies. These studies, I have reason to believe, are not sufficiently well known among those who arrange lantern entertainments for children, or the crudely-coloured, grotesquely drawn, and generally repulsive type of lantern slide so greatly run upon, would soon be consigned to deserved oblivion. There are many admirable lantern sets on the market, but the nightmarish "Jack the Giant Killer" type is still catalogued by dealers, along with other kindred atrocities. There should be an Act of Parliament passed to prohibit their display.

AN IMPROVED SELF-ACTING TONING PAPER.

[Patent No. 19,683 of 1899.]

In self-acting toning papers the soluble salt of gold affected the toning in the fixing bath. Hitherto, says the patentee, Herr Raethel, chloride has been added to the emulsions, partly for chloridating the silver salt and partly to influence the tone, of the prepared picture. In all cases the gold merely has been employed for the purpose to accomplish the toning of the picture.

The object of the present application is to provide a paper in which the gold not only forms the toning ingredient, but in which it also assists the production of the picture already before the toning.

The manufacture of my paper is based upon the knowledge that salt of gold in conjunction with or in presence of chloride of barium is very sensible to the action of light, whilst chloride of gold ($AuCl_3$) alone is insensible to the same. My process is carried out in the following manner:—

I produce two solutions or emulsions sensible to the action of light, the composition of both being the following:

1. The emulsion of silver sensible to the light, for instance, consists of
400 grains collodion (5 per cent.).
16 grains nitrate of silver dissolved in
20 grains of distilled water, and
50 grains of alcohol.
5–8 grains of a chloric salt, for instance, chloride of calcium, lithium, strontium or magnesium, dissolved in 20 grains of water.
5 grains of an organic acid, as, for instance, citric acid, dissolved in 20 grains of alcohol.

2. The gold emulsion sensible to the action of light is produced in the following manner:—

To a solution of 0.1 grain of chloride of gold ($AuCl_3$), dissolved in 100 parts of ether-alcohol, about 5 drops of a solution of 1 grain chloride of barium in 40 grains of alcohol (40 per cent.) are added, and then the whole is thoroughly mixed with about 200 grains of collodion (5 per cent.).

Chloride of barium in presence of chloride of gold is easily and completely soluble in the mixture of ether-alcohol with pure alcohol (40 per cent.).

Both solutions remain inactive for about 12 hours, and then 80 grains of the gold solution are added to the above quantity of prepared silver emulsion, the whole being shaken thoroughly.

The emulsion thus produced and mixed can now be employed, and the pictures, after having been dried, are ready for printing.

The pictures copied upon this paper are of reddish-brown colour, and for the purpose of toning are placed into water, whereby that quantity of the chloride of gold which has not yet been attacked by the light acts as a toning medium. A repetition of the fixation and of the water bath suffices to obtain reliable pictures of an intense purple colour.

Our Editorial Table.

The International Annual of Anthony's Photographic Bulletin for 1901 is made up, as in former years, of articles and reproductions from photographs. Most of the latter are not very new in style or treatment, but they are at least intelligible, which many modern American photographs are not. The book is an excellent example of typography, but it is not quite free of error in the section devoted to English photographic societies, the list of which is neither full nor accurate. Messrs. Percy Lund, Humphries, and Co., 3, Amen-corner, E.C., are the publishers of the Annual.

Studio Gossip.

SIR L. ALMA-TADEMA ON ART.—Sir Lawrence Alma-Tadema, R.A., presented the prizes and certificates to the successful students of the Hornsey School of Art at their annual soirée at the Corbin Hall, Crouch End, last week. Addressing the students, he said the great difficulty of an artist—and one which literary men never quite understood, because they had not learnt it by experience—was excellence of execution. Of course the ideas and feelings must be there to make art complete. Still, excellence of execution and the way of expressing the painter's ideas in such a way that Jack and everybody could understand them at a glance, were very perplexing. Ever since he was a youth he had always been guided by this principle of excellence of execution, and he hoped he would never be satisfied with his work; because people who were satisfied with what they produced had no higher aim, and had better not do any more. Art was many-sided. Everybody could not paint imaginative pictures, nor could everybody obtain the same excellence. If they felt more inclined to devote their artistic bent towards the making of furniture—and there were great masters in this kind of art—he would urge them not to think for a moment that it was less important, because it appealed to the greater masses of people, teaching them that there was beauty wherever it could be seen. People were taught to see beauty when their furniture was made in good taste. If they designed a chair or anything else, their first thought ought to be as to how it was going to be used; because one of the great beauties of a thing lay in its use.

News and Notes.

THE Rontgen Society's next Ordinary General Meeting will be held on Thursday, January 3, 1901, at 20, Hanover-square. A paper will be read by Mr. A. W. Isenthal on "Continental Progress in Practical Radiography and Apparatus." Before the paper Dr. J. H. Sequiera has kindly consented to show some cases of rodent ulcer treated with X rays, which will be further referred to on the therapeutic discussion evening.

THE South London Photographic Society's Lantern-slide Competition.—The following is the list of awards for the best sets of six lantern slides made from negatives taken on the South London Society's Rhine trip last summer:—Silver medal: T. Morley Brook; bronze, C. J. King, C. Churchill; highly commended, W. Page; commended, A. Bedding, W. Page. Mr. Bedding's slide of the fourteenth century carving at Bonn was adjudged to be the best individual slide. The judges were Messrs. G. J. T. Walford and E. R. Bull.

APOCHROMATIC COLLINAR LENSES.—Messrs. Voigtlander and Sohn, of Brunswick and London, announce the issue of a new series of apochromatic collinac lenses. It is stated that the glasses used in the lenses have been selected so that the secondary spectrum is completely corrected, consequently the three images for blue, green, and red fall on the same plane and are the same size. By this apochromatic correction the sharpness of the definition has been increased, and is more even over the whole image than with an ordinary objective of the same aperture.

THE Brentford Photographic Society's Third Annual Exhibition will be held in the Large Hall, Public Baths, Clifden-road, Brentford, on Tuesday and Wednesday, March 19 and 20, 1901. The following will act as judges:—Messrs. John A. Hodges, F.R.P.S., J. C. S. Mummery, and James A. Sinclair, F.R.P.S. The following is the Open Section: Landscape and Seascapes, Portraiture and Figure Studies, Architecture, Flower and Animal Studies, Lantern Slides. Silver and bronze medals will be awarded, at the discretion of the judges, in each class. Entry forms, accompanied by a remittance, must be sent to the Hon. Secretary, Mr. Hilton Grundy, Brentford, Middlesex, by Friday, March 8.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
1.....	Gospel Oak	Exhibition and Criticism of Members' Lantern Slides.
2.....	Borough Polytechnic	Pictorial Lantern Slides. R. R. Rawlins.
2.....	Croydon Camera Club	A Filmless Cinematograph. Alphonse Courlander.
2.....	Royal Photographic Society ...	Opening of Exhibit on of Photographs and an Address by Frank Sutcliffe.
2.....	Woodford	How to Make a Picture. J. T. Athby.
3.....	Darwen	Lecture: Hand-camera Work.
3.....	Hull.....	Lantern-slide Making on Kristal Plates by Gaslight. T. G. Ames.
3.....	Oldham	Trize Slides.
3.....	Königton Society	Paper by A. W. Isenthal.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 20.—Mr. P. R. Salmon in the chair.

Mr. Rapson passed round several developed chloride prints, being the results of experiments he had carried out on the lines of the demonstration given at the last meeting by Mr. J. E. Hodd. Mr. Rapson had tried for the toning phosphate of soda, which produced a reducing effect; acetate of soda, which made the entire print very dirty; and a combination of phosphate and acetate, which gave a better tone than either used singly, and also the sulpho-cyanide bath, which gave the cold tones Mr. Rapson preferred, and which he could not get by any other. A discussion then followed on the personal likes and dislikes of cold and warm tones.

Mr. E. Human, *re* the stains produced on the dish by this dissolving process, said he had found no difficulty in removing them by the usual reducer of ferricyanide and hypo.

Mr. P. Everitt showed one of the Steinheil lenses which had been brought over to him from Germany, and he thought that this lens was the first of its kind brought into this country, and was not an anastigmat, being nearer to the older series of aplanats, and is known as a Series V. Copying Lens, this one in particular being 17½ in. focus, working aperture 20. During the past few years this series had been very considerably improved, each combination now consisting of three glasses, instead of two, as in the past. Mr. Everitt pointed out that this lens, which was very much smaller than other aplanats of this focus, was listed to cover, for landscapes, a plate, 20 in. × 16 in., and the price £9. F-20 is considered the largest working intensity, but f-15 is the full aperture, and at this it is quite free from spherical aberration. The advantages claimed for this lens are its cheapness, its extreme usefulness for architecture and landscape, and its small bulk compared to the usual R.R. of this focus.

Mr. Cleary, of Montreal, brought up a considerable number of stereo views of South Africa, &c., and which were found to be very interesting, the quality of the prints being more than usually good for trade stereographs.

Mr. Mackie passed a few remarks on the art of photography as we know it now, commencing at the beginning of the present century.

PHOTOGRAPHIC CLUB.

DECEMBER 19.—Mr. W. R. Stretton in the chair.

Mr. H. Snowden Ward, F.R.P.S., gave a lecture upon the McDonough-Joly process of colour photography, the inception of which in 1862 was credited to Ducos du Hauron. The process would have probably been developed right away had it not been for the fact that it involved the use of plates fairly equally sensitive to different parts of the spectrum, which were not then obtainable. The process was brought out simultaneously in America by McDonough, and in England by Joly, who appear to have been working quite independently one of the other. Mr. Ward said he had been working the process during recent months, and with great satisfaction to himself. Many difficulties had been pointed out by critics, but he could frankly say that, while some of these were real and some fanciful, there were other pitfalls that had not been alluded to. The process was liable to the difficulties attending ordinary photography, and it had others peculiar to itself. It had the virtues also of ordinary work, apart from extreme speed, with the added recommendation of colour reproduction. He did not wish to compare the process with any other—Lippmann, Ives, &c., all of which were interesting in their way. The McDonough-Joly process introduces no novel methods to the photographer, and the additional appliances when obtainable commercially are not likely to be expensive. Mr. Ward outlined the principles of the process as follows:—A plate sensitive to all parts of the spectrum, such as the Rapid Spectrum, in England; and an orthochromatised Seed plate, in America, is exposed in close contact with what is known as a taking screen. This screen is a glass plate ruled with very narrow parallel lines, red, green, and blue-violet. Joly adopted 240 lines per inch, and McDonough 300 lines. The objection to the use of finer lines is in the difficulty of afterwards superimposing the positive and the viewing screen. Coarser lines, on the other hand, become aggressive. Now, every object in the original, which reflects blue light, affects only the part of the plate covered by the blue lines of the screen, the red and green lines preventing action in their preserves by absorption. When the plate is developed the silver is found deposited in lines which fall under the blue lines of the screen. A positive from

his negative placed in contact with a viewing-screen ruled similarly to the taking screen would allow only the blue lines to be seen, thus reproducing the original colours. By this process positives on paper or glass may be made and seen in natural colours. Mixtures of colours are reproduced by partial action through the various lines, but, in viewing the picture, the colour effect is obtained by a visual combination of the colour lines, not a true combination of the colours. A special light filter hat is adjustable for special conditions is used, and one was shown to the meeting. For paper prints, paper ruled in a similar way to the screen is sensitised with silver emulsion, and an arrangement is made to register the lines of the negative with those of the paper. The silver deposit serves as a stencil, covering up some of the lines and allowing others to remain visible.

Mr. Ward then showed on the screen some lantern slides taken in England by himself and by Mr. C. N. Crewdson, which gentleman also showed a fine series of pictures taken at the Ober-Ammergau play. The examples of the process were received with every sign of interest, but criticism was made of the rendering of the colours in several of the pictures.

Aintree Photographic Society.—At last week's meeting, Mr. E. E. Thorpe gave a lecture on the "Norman Castles of Wales," and demonstrated by a series of lantern slides the great possibilities for the camera in and around the large number of ruined castles in the "land of the leek," many of which are scarcely less striking than the splendid and romantic scenery in which they are situated. This, and the fact of them having associations with historical events and traditional legend of more than ordinary interest, affords ample work for the photographer who can spend a lengthened tour in Wales.

Patent News.

THE following applications for Patents were made between December 10 and December 15, 1900:

STUDIOS.—No. 22,449. "Improvements relating to Photographic Studios." Communicated by C. Bernhoeft. H. H. LAKE.

PRINTING FRAMES.—No. 22,633. "Improvements in Photographic Printing Frames." J. WILKINSON and A. WILKINSON.

TONGS FOR DEVELOPMENT.—No. 22,669. "Tongs for Photographic Developing Purposes." J. T. PARTRIDGE.

DEVELOPING "MACHINES."—No. 22,696. "A New or Improved Developing and Fixing Machine for use in Photography." H. LÖSCHER.

"COPYING MACHINE."—No. 22,697. "Improvements in Photographic Copying Machines." H. LÖSCHER.

CAMERAS.—No. 22,904. "Improvements in Photographic Cameras." H. SIEVERS.

CHANGING APPARATUS.—No. 22,971. "A New or Improved Apparatus for Changing Photographic Plates or Cut Films." P. J. JOB and T. NAYLOR.

LANTERNS.—No. 22,981. "Improvements in and connected with Kinographs and Magic Lanterns." Complete specification. G. W. BROWN and G. R. BEAUMONT.

FORTHCOMING EXHIBITIONS.

1901.

January 14-19..... Blairgowrie and District Photographic Association.

The Hon. Secretaries, Blairgowrie, N.B.

February 16-March 9 Edinburgh Photographic Society. Secretary, J. S.

M'Culloch, W.S., 10A, George-street, Edinburgh.

Correspondence.

* * Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

* * We do not undertake responsibility for the opinions expressed by our correspondents.

GREEN FERRIC AMMONIUM CITRATE.

To the Editors.

GENTLEMEN,—I notice that in THE BRITISH JOURNAL ALMANAC for 1901, p. 799, there is an article on the manufacture of blue printing paper with green ferric ammonium citrate. In this treatise the writer made a statement that the green ferric ammonium citrate was not obtainable in this country, which statement I should like to rectify, as I have been some years manufacturing ferric ammonium citrate

green scales, and, as a matter of fact, have been supplying it to this country for a very long time, and I am still doing so.—I am, yours, &c.,
E. MERCK,
per FREDK. BOEHM.
16, Jewry-street, London, E.C., December 20, 1900.

MR. ARCHER CLARKE also writes:—"Ferric ammonium citrate (green crystals).—'Oons,' in the 1901 ALMANAC, p. 798, throws a doubt on being able to obtain above in England. Let me add this fact that over six months ago I purchased 2 lb. of Elliott, 36, Jewin-street, London, E.C."

COINS AS WEIGHTS.

To the Editors.

GENTLEMEN,—At p. 987 of the ALMANAC for next year you give a table for using coins as weights. All such tables that I have seen are founded on the legal weights of new coins, and are of little use except as a last resource for rough purposes. A very slight use of coins renders them sensibly light, and it would always be better to use such cheap weights as can be readily procured everywhere.

Gold coins (especially sovereigns) are now fairly accurate, as a sovereign ceases to be legal tender when it has lost about three-quarters of a grain of its standard weight, and a half-sovereign when it has lost about half a grain. These coins pass constantly through the banks, and are withdrawn when found light.

With silver coin, the case is otherwise: the law does not prescribe a minimum weight for their currency, and practically they remain in use till the impress on them is barely visible. The weights in the table are the legal weights of new coins, subject to the variation known as the remedy, but they can not apply to the contents of our purses or tills.

I have had the curiosity to examine the contents of my purse, with the following results:—

Five half-crowns weighed in the aggregate 68.17 grammes instead of 70.69 grammes, and the lightest weighed only 12.80 grammes instead of 14.14.

Of seven shillings, which should each have been 5.655 grammes in weight, the lightest only weighed 5.392 grammes; while the whole weighed 37.74 instead of 39.585 grammes. Thus the half-crowns had lost 2.7 per cent. of their weight on an average, and the lightest of them no less than 9.2 per cent. The shillings had, on the average, lost 4.6 per cent., while the most worn was 6.8 per cent. too light: nor were these coins nearly worn out.

Copper, or properly bronze, coins are even more untrustworthy. Ten pence were found to weigh 87.92 grammes, instead of 94.5 like new coins from the Mint; they had fallen off 7 per cent. from their full weight, while the most worn one weighed only 83.1 instead of 94.5 grammes, being thus 12 per cent. below standard. Those who are at all particular about weighments will therefore use even the cheapest weights they can buy rather than trust to the contents of their purses.—I am, yours, &c.,

J. F. T.

WANTED—A HISTORY OF PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—During the next few days the columns of the general newspapers will, no doubt, give place to many articles treating on the advances in knowledge that have taken place in the century which closes on Tuesday next. Photography, of course, is bound to come in for mention, but the professional journalist will hardly be in a position to tell his readers anything of more than superficial interest on that subject. "The Photography of the Century" would supply an excellent topic for treatment in the pages of a photographic paper; but, here, again, I very much doubt if it would serve any useful purpose, beyond supplying a little agreeable reading. The fact is that photographic history, so far as it has been written in this country, is in a very untrustworthy state. From the days of the Daguerreotype, photography may be said to have been in constant process of evolution, with the result that highly important successions of improvements and advances have taken place. But a correct apportionment of individual credit for the work has never yet been made, and, in consequence, there are many reputations in photography of spurious value, while others, if justice were done to them, would stand much higher than they do. We must look to some undiscovered and competent historian to right all this. Meanwhile, it is safe to say to such a one a most important conclusion will very easily force itself upon him, viz.: to no single individual can be assigned the credit of having discovered or invented photography. It is a common error to assign pre-eminence to certain workers without taking into account the assistance they have derived from the labours of others. What is needed is a proper adjustment of credit—in fact, a reliable history of photography.—I am, yours, &c.,

F. R. Hist. Soc.

London, December 22, 1900.

MR. SUTCLIFFE'S EXHIBITION AT RUSSELL-SQUARE.

To the Editors.

GENTLEMEN,—I beg to inform you that on Wednesday, January 2, 1901, at 8 p.m., the Royal Photographic Society will open at 66, Russell-square an exhibition of photographs by Mr. F. M. Sutcliffe, of Whitby, and an address will be read. The Exhibition, it is expected, will remain open until Saturday, February 16, daily (Sundays excepted), from 10 to 4, Wednesdays 10 to 8. Admission on presentation of visiting card.—I am, yours, &c., A. W. W. BARTLETT,
Assistant Secretary.

66, Russell-square, December 22, 1900.

Answers to Correspondents.

** All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

** Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

** Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:—

J. Warwick, 82B, Lowther-street, Carlisle.—Photograph of Union Jack taken to Pretoria.

OTHELLO.—In our opinion you are not liable.

D. O. (Treharris). We have no present cognisance of the firm you name.

EXPIRATION OF TENANCY.—"G. H. G." says: "I have my studio and premises on a three years' agreement, which expires in March next. What notice must I give, as I wish to clear out then?"—In reply: No notice is necessary, as the tenancy terminates at the end of the time for which it was made.

PLATINUM RESIDUES.—"BEDFORD CIRCUS" asks: "1. Is it any use to send clippings of platinotype paper to the refiner? 2. Is it worth while to save any washings in any part of plat. printing?"—In reply: Metallic platinum is recoverable from both paper clippings and used developers, but the quantity of these must determine the point whether it is worth while troubling a refiner in the matter.

CERAMIC PHOTOGRAPHY.—W. WALKER writes: "I have an inquiry for a tile with the photo of a lady burnt in for insertion in a granite monument in cemetery. Will you kindly tell me where I could get the same, and oblige?"—In reply: Messrs. Mawson and Kidd, Richmond, would, no doubt, supply a ceramic enamel. We are not sure if tile work is still undertaken in this country; but some reader may help our correspondent in the matter.

ELECTRIC LIGHT FOR PORTRAITURE.—"H. P. G." writes: "Can you, please, tell me what C.P., with an arc light, is generally used for portraiture so that two or more persons can be taken in a group? The current on our mains is a continuous one."—In reply: From six to ten thousand candle-power is what is usually employed. The greater the light the farther it can be placed from the sitters. That is necessary when groups have to be taken.

THE TANQUEREY FRAUDS, &c.—"AMIDOL" asks: "1. Would you advise me or any photographer exhibiting the cutting from your paper concerning the frauds by the foreign firms, Tanquerey, &c.? 2. What good book or books can I obtain on the lighting of photographic studios, and where, price, &c.?"—In reply: 1. Such a course might have a good effect. 2. "The Studio and what to do in it," by Mr. H. P. Robinson. It is published by Sampson Low and Co., Fetter-lane, E.C.

COPYRIGHT.—"A. Y. X." writes: "A photographer here has a negative which he has made copyright, and he offers to sell it to me for a certain sum. What I want to know is this: If I buy the negative do I get the copyright with it, or does that still rest with him, as he is the author of the work?"—In reply: The copyright will not pass to you with the negative unless the photographer duly assigns it to you in the ordinary way. See that is done before you complete the purchase.

OBSCURING STUDIO VIEWS.—"S. F. J." writes: "I have taken a studio which is on the ground floor, and any one passing through a side street can see into it and stand and watch while I am taking sitters, which greatly disturbs them. If I pull down the blinds I stop off the light, and if I were to frost the glass I should also lose a lot of light. Is there any other means of overcoming the annoyance?"—In reply: We should recommend that the side be glazed with fluted (white) glass. That will obstruct no light and cannot be seen through.

PHOTOGRAPHING PLATE.—"R. P. J." says: "I expect shortly to have two large challenge cups to photograph. They are silver, and some parts are highly burnished, while others are matt. Would there be any advantage in using orthochromatic plates for the work; also, would there be any good in backing the plates?"—In reply: We do not think any good would accrue from employing orthochromatic plates. But the plates should certainly be backed for subjects of this character.

TONING LANTERN SLIDES.—"C. L. S." asks: "Can you tell me whether there is a pamphlet published on the toning or otherwise altering the colour of lantern slides, or whether such information is only scattered about in the various photographic journals? I have seen slides having different colours in each slide, produced by chemical means, such as brown cows, green trees, and blue sky."—In reply: In Mr. Hepworth's "Book of the Lantern" he gives much information on the hand colouring of lantern slides. Data as to differential toning are very scattered.

"CANSON'S PAPER EXPERIMENTALIST" says: "I have been reading an old work on photography, in which, with one of the processes, Canson paper is recommended above all others. Can you tell me where it is to be bought? I have inquired at several dealers, and they say that there is no such thing, or that they have never heard of it, &c."—In reply: This paper was much in favour in the early days of photography. It was made by Canson Brothers, Annonay, France. It is probably not made now, as we have not heard of it in the market for many years.

VELOX VERSUS PLATINOTYPE.—E. COLE writes: "I am writing to ask your opinion of the relative value of 'platinotype' paper and 'Velox,' also their commercial value one to the other. My reason for doing so is, I am engaged in a photographic firm, whose name, of course, I must withhold, and the Velox is passed for platinotype, which, if their character or value differ, should not be done from matter of principle."—In reply: Quite so. A Velox print consists of reduced silver, a platinotype print of reduced platinum. To pass one off for the other is at least a deception, if not a fraud.

STARCH PASTE.—M. A. BINNS says: "I use starch for mounting our prints. Can you tell me of anything that I can put into it to keep it from going bad, as it is such a bother to make it fresh every day or two?"—In reply: Any antiseptic will preserve the paste from putrefaction, such as carbolic acid, oil of cloves, salicylic acid, and the like. But we should advise the paste to be used freshly made. Surely there is not much trouble involved in mixing a little starch from time to time as it is required. Freshly-made starch paste is more adhesive than that which has been kept for some time by the aid of antiseptics.

THE ROYAL ARMS.—"LOYAL" writes: "Some years ago I supplied some photographs, prints, to the order of the Queen. They were ordered direct from her. I am opening a new branch, and have bought secondhand a coat-of-arms with 'By appointment to Her Majesty' upon it, which I am having repainted and freshly gilt. A friend tells me it will get me into trouble if I put this over my shop front. But the carver and gilder says I am perfectly entitled to use the Royal Arms if I have supplied anything direct to the order of the Queen or any of the Royal Family. Who is right?"—In reply: It will be decidedly illegal to use the Royal Arms in the circumstances detailed. You must hold the Royal warrant to entitle you to put up the Royal Arms.

WINTER PORTRAITURE.—THOS. CONWAY says: "I have a portrait of a lady, taken in America, in which she is represented as in a snow-storm, with the snowflakes falling all around. Can you tell me how the falling snow is managed?"—In reply: There are different ways of producing the effect. The most general one is to splash over the negative some opaque pigment, in the following way: Grind up some, say, flake white on a palette. Then take a tooth-brush and touch the ends of the bristles in the colour, and then, holding it a little distance from the negative, pass the back of a knife over them so as to sift the colour on to it. If the negative be varnished, as it should be, the colour can be cleaned off, if the first attempt is not satisfactory.

THE INCANDESCENT LIGHT, &c.—"ETUM" writes: "My room is about 14 ft. square, 12 ft. high, with two good windows, north aspect. The windows reach to within 2 ft. of floor and top. There is a gas main on sufficient for 15 ordinary burners, no electric current near. I have a half-circle reflector of wire frame and tinned over, formerly used at a bazaar, 4 ft. diameter. 1. It struck me that if I had a gas bracket fitted to this to take fix or six incandescent burners I might manage portraiture at night. Could I? 2. Would six lights be sufficient for 5 in. exposure on fast plates? 3. How should burners be arranged, in straight line or circle? Of course, the reflector would be arranged to face the sitter, and (4) should it be plated or enamelled white? 5. Also, please inform me if the enclosed portrait (not retouched) has been correctly lighted?"—In reply: 1. It is possible, but the exposure will be long, we expect, with such a limited light unless it were placed very close to the sitter. 2. We fancy not. 3. Better arrange them in two rows. 4. Enamelled white. 5. The lighting is not good, there is not sufficient shadow to give rotundity to the face. Too much front light.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."]

[January 5, 1900.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

ONE hospital in New York has adopted a camera to record minutely the action of patients in epileptic fits and similar afflictions, and many moving pictures have been taken showing the movements in walking of persons afflicted with locomotor ataxia. They are produced slowly on the screen, so that physicians are enabled to study the symptoms carefully. Moving pictures have been taken in Vienna showing operations being performed by great surgeons.

* * * * *

In a memoir recently presented to the Paris Academy of Sciences, M. Berthelot refers to the explosive properties of chlorate of potassium. He finds that, if the chlorate is suddenly placed in a vessel at a higher temperature than that at which decomposition commences, the salt explodes, though, if slowly heated, the chlorate does not explode. The investigation was probably made in consequence of a comparatively recent disaster in Lancashire.

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AN electrically ignited flashlight apparatus has recently been introduced into the United States. It consists of two cells of a powerful dry battery enclosed in a box suitably connected up in circuit, one part of the circuit being connected to two screws with spring fingers attached, and similar screws at the bottom, at the narrow end. From one screw is a light spring wire, having a loop in its end, to which a spring is attached. From the other screw projects a hook-shaped shorter rigid wire. When the spring wire is pulled forward by the string, it brings both terminals into electrical contact. To the right of the box is a flash card, having two fine wires on the surface arranged in a diamond form, and having in their circuit a minute platinum fuse. The card is placed on the box, and the wire terminals are slipped under the two spring wires, which completes the electrical circuit. The flash powder, in a small round box, is poured out on the card in the diamond-shaped space in such a way that some of it comes in contact with the platinum fuse. To ignite the powder, it is only necessary to close the electrical circuit by pulling lightly on the string, which brings the two wire terminals at the bottom into contact, causing the electric current to heat the platinum fuse to redness and instantly fire the powder. The operation is extremely simple, and enables one to remain at some distance from the flash, and even to be included in the picture, as it is evident that the length of the string can be adjusted to suit the circumstances.

It is stated that with a light of this kind it is an easy matter to take instantaneous interior daylight photographs of children and infants. Placing them near a window, the camera is adjusted on a stand and focussed. The flash light may be located six feet or eight feet from the subject, arranged to illuminate the shadow side of the face. The shutter of the camera may be set a very slow speed. Taking the operating bulb of the camera in one hand and the string of the flash lamp in the other, the photographer can set off both at the same time, compressing the shutter bulb with the right and pulling the string with the left hand. The intensity of the shadow side may be varied by the distance of the light from the subject. Very soft and pleasing children's portraits may be made in this way; but flashlight pictures at night can be made perfectly, and in large rooms duplicate sets of light can be arranged to flash at once and thereby give proper illumination.

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THE European Blair Camera Company, Limited, of the Mills, Fooths Cray, Kent, have issued the following notice to the trade: "In order to meet the largely increased demand for our sensitised cinematograph film, we have found it necessary to enlarge our plant and devote our attention solely to the manufacturing end of the business. We have made arrangements with the Warwick Trading Company, Ltd., 5, Warwick-court, High Holborn, London, W.C., whereby the said Company will purchase our entire output of sensitised cinematograph film from and after January 1, 1900. All future orders for our film should therefore be sent to the said Company. This arrangement, however, applies only to our sensitised cinematograph film, as we still continue to supply our plates, cartridge, and cut sheet films direct from the factory."

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ACCORDING to a contemporary, the system adopted by M. Boyer in taking flashlight photographs of the Parisian theatres consists briefly of an arrangement for burning several magnesium cartridges in succession. A number of batteries of burners are used and pure magnesium is consumed. The powerful blowing apparatus permits a prolonging of the flash for the time required. The cartridge apparatus is actuated by electricity. In order that it may be possible for the operator to make a series of negatives without being annoyed by the smoke of the preceding flashes, there is installed a ventilating fan actuated by an electric motor. By means of a cloth sleeve the smoke and dust are carried outside of the building.

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IT is stated that experiments with acetylene gas, made by a pine-wood proprietor in France, demonstrated that, by combining it with resin oil, it does not evaporate so quickly, is less explosive, and gives the carbide a pleasant odour. The acetylene light has been adopted by several establishments in Bayonne, the calcium carbide employed being mostly imported from America and Switzerland, and sold at about 1*l. 4s.* per cwt. A number of calcium carbide factories are reported to be in course of

construction in the neighbourhood of Lourdes (Hautes Pyrénées), which, it is expected, will in the course of time effect a considerable reduction in the price.

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A NOVEL idea has been hit upon by Messrs. Eyre & Spottiswoode, Her Majesty's printers, in the production of a lantern lecture upon "The Boer War Day by Day," illustrated by many absorbingly interesting lantern slides. Messrs. Eyre & Spottiswoode announce, as a unique feature, that, both in descriptive matter and slides, the lecture will be daily brought up to date. It will, in fact, become a "Lantern War News," additions being made up to the latest possible moment.

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MESSRS. NEWTON & CO., of Fleet-street, have obtained the sole right to make lantern slides from the *Illustrated London News* and the *Sketch's* original drawings of the Transvaal War. This enables Messrs. Newton to bring their list of war slides up to date week by week. They also publish a reading to accompany about 200 slides.

LANTERN MEMS.

THE New Year brings new ideas and new resolutions, but an old wish that is always welcome will remain, and that I now give my readers ; it is, "Best wishes for a healthful, happy, and prosperous New Year." It seems strange to write 1900 after so many years writing eighteen hundred and something. Many years. Yes! And what changes in that time! Changes and losses among our friends—changes in our business or professions, changes of fashion in hobbies and apparatus, and changes in methods of working.

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THIS is not the page for moralising, so I will briefly refer to changes in style and form of instruments and apparatus and in their manipulation. The optical lantern in principle is the same as the ancient magic lantern ; but what a contrast in detail and improvement in the optical arrangement and the illuminant! A lanternist must be hard to please who cannot find the apparatus he wants for ordinary projection, or have made to his order, without much trouble, one that will meet his *special* requirements. It is really remarkable what an enormous difference can be made when required in a lantern to suit individual tastes, and from this I am forced to the conclusion that finality is not yet reached, and probably it is as well for the popularity of the instrument that it is so.

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IF a machine or apparatus becomes stereotyped, it loses its charm, and in like manner, if a camera or lantern cannot be made with distinctive points of merit, the owner has not the same pleasure in it. Who cannot recall the pride, and perhaps justifiable pride, with which the points of the same have been emphasised to the select circle of admirers, or enlarged upon at the Club meeting? Most men, and women, too, for the matter of that, like to be distinctive. I saw a play recently where the son's wife thought to please the mother-in-law for once by giving an order for a gown to the same dressmaker, to be made "as mother likes it," and the horror created by both mother-in-law and wife appearing at dinner in similar attire. So it is at a club outing ; if B has an apparatus after the type of that used by A, he takes care to have this or that added, "Just a little dodge of my own, you know, which I found so very useful in previous work."

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GOOD "biz!" I say ; let the fresh ideas come along, and put them into practice, and may the results in 1900 justify their adoption. Let it be with a lanternist as it is with a sportsman with his gun ; get the best that money can buy, or brains conceive, and skilled hands carry out, and there will be no fear of any want of popularity of the optical lantern, especially if during the summer photographs of a high standard have been taken that can be projected on the screen to the delight of friends or the public.

Now, what are the improvements since I have known projection apparatus? It is a long catalogue I am afraid ; but, if it can be put briefly, it may be interesting. As regards the light, first, let me think what choice there is now against that available when I first touched a first-class lantern thirty-five years ago. Then it was Colza or sperm oil lamps, oxycalcium spirit lamp, and oxyhydrogen limelight with gas bags ; now we have the arc electric light of any desired power, high-pressure oxyhydrogen limelight, and compressed gas in cylinders, oxyether light, blowthrough jets or injectors, with oxygen gas only under pressure, giving as much light as the old mixed gas jets, acetylene gas light, incandescent gas light, incandescent electric light with focus lamps of 100 candle power, improved paraffin lamps with three and four wicks, giving really good results for small-size disc. The old single combination lenses have disappeared, and now, even with a lantern retailing for about 11., a good portrait combination front lens is supplied, also a passable four-inch double condenser of plano-convex form, and a three-wick lamp is fitted. This is a satisfactory lantern for those with slender purses, and provides the means of instruction and amusement for the family and for schools.

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THE higher-class apparatus embraces improvements in steadiness of mounting, convenience of manipulation, extra facilities for centering the light, and superior optical arrangements to secure best possible definition, and the size projection required for the particular distance most suitable for the hall or room where it will be employed. This range of focus has accounted for a great number of plans for altering the front, and embraces telescopic tubes of sliding or rack-work pattern, solid tube with inside sliding jackets, leather bellows front, open fronts on plain sliding mounts, and on lathe beds, according to rigidity required, and box extension of various patterns. The objectives are of various diameters from 3 inches of 16 to 12 inches focus, down by degrees to, say, 2 $\frac{1}{2}$ inches for 10 and 8 inches, 2 inches diameter for 6 inches focus, and slightly less for five inches and 4 inches equivalent focus. The bodies, or light-screening portions, may be as fancy dictates or as County Councils will ; but, if one is desirous of avoiding the risk of a burn when a powerful light is employed, an asbestos and Russian iron-lined mahogany or other wooden body is advisable.

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TRIPLE and biunial lanterns have been so improved in mechanical details that perfect centering and registration of effect slides is ensured, and one operator can now manipulate a first-class apparatus more easily and certainly than two operators used to work a side-by-side pair of lanterns in the old days. Then as to apparatus for the projection of animated photographs, which was scarcely conceived possible at the time I go back to, we have such a list and variety that a purchaser is bewildered what to decide on. He cannot do better than go to a firm he has confidence in, and, after saying how much he is prepared to spend, leave the selection in his hands. Those who have already had experience in exhibiting animated photographs will have found out for themselves what are the difficulties of manipulation, and be able to choose an apparatus that gives them the maximum steadiness with the minimum of trouble, and secure safety in working with the least wear and tear on the films.

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THE BRITISH JOURNAL OF PHOTOGRAPHY ALMANAC, always so valuable, is again excellent in the editorial and other articles, and the information it places so conveniently for the use of its readers ; but there is one subject that is not, perhaps, quite so well represented as usual, and that is the optical lantern, and enlarging by its means. I, for one, owe an apology to the Editor for not having an article in as usual on some subject connected with optics or the lantern. My excuse is, that my hands have been exceedingly full for the last six months, more particularly in connexion with work due to the military forces proceeding to South Africa. No doubt, all my readers join with me in wishing our troops the best of luck in the new year, and a speedy termination of the war, so that our thoughts

may be concentrated on the progress of the arts, and such technical matters as, say the improved power of lantern lights, and advances in optical apparatus, rather than on the development of appliances for the destruction of men.

G. R. BAKER.

CARBON LANTERN SLIDES.

It is generally conceded that the acme of perfection in slide-making is reached either by the Woodburytype or carbon processes; the former is, as a rule, quite beyond the amateur, and the latter is not very much used, as the preparation of a slide by means of the gelatine lantern plate is so simple. The beauty of the carbon slide lies, as a rule, in the exquisite transparency of the shadows and the perfect rendering of all the tones in the negative, and the general absence of anything like grain, as the pigment in special transparency tissue looks more like a stain than a solid.

For absence of grain there is no doubt that the gelatino-chloride printing-out plate ranks next to them, and then the gelatino-chloride developing plate. It is possible, however, to obtain slides in almost any colour by what is certainly a carbon process, and a modification which has the advantage of requiring no tissue, but in which the ordinary gelatino-chloride printing-out paper can be used.

It is immaterial whether the paper has become yellow through age or whether it is a spoilt print, though in the latter case the printing is a little more difficult.

Allow the paper to darken to a deep rich colour by exposure to daylight, but in no case must it be allowed to bronze; it should then be immersed for two minutes in a five per cent. solution of common salt, then in a four per cent. solution of bichromate of potash and dry it, preferably by squeegeeing it to a piece of waxed plate glass and allow it to dry in the dark. When thoroughly dry, it can be exposed under the negative, allowed to soak in water till limp, and then squeegeed to a lantern plate from which the silver image has been removed by means of potassium cyanide well washed, and then treated with a ten per cent. solution of formalin and rinsed. The exposed paper may be squeegeed to a plain piece of glass without any gelatine, but it requires extremely careful handling.

When squeegeed down, it should be left for at least half an hour and then developed in warm water exactly as an ordinary carbon print, only that the paper should not be pulled off, but merely allowed to float off.

When the image is quite developed, it may be dipped into alum solution or weak formalin, washed, and then toned with any gold bath or platinum, or intensified by any of the ordinary methods as used for negatives. Exquisite results are obtained by merely immersing in a ten per cent. solution of silver nitrate, blotting off superfluous moisture, exposing thoroughly to daylight, and then toning in a combined bath.

A. D. PRETZL.

LANTERN MATTERS.

SINGLE-LANTERN PROJECTION.

Of the objections generally urged against the employment of single lanterns in limelight projection, perhaps the one which has hitherto received most consideration at the hands of lanternists is that relating to the liability of an interruption arising from the breakdown of a lime, and the consequent necessity for a temporary stoppage during the period a new cylinder is being substituted. To many ardent lanternists, no doubt, this objection appears one of almost vital importance, and hence the recourse we so frequently see to the employment of biunial lamps, even for the projection of ordinary sets of lecture transparencies.

The objection mentioned, no doubt, has tended to detract from the popularity of single-lantern work, for, in years past, there is no doubt it was a difficult matter to employ a powerful mixing jet for a period of close upon one and a half hours' time without having to change a lime during that period of working, and in some instances, where bad samples of limes were used, even more difficulty was experienced. The increase of power in modern forms of mixing jets (which, no doubt, have been

more particularly designed for use in cinematographic projection) has, at the same time, called for the production of a more durable species of lime than was obtainable in former days, when what may be termed merely lower-pressure jets were almost solely employed. The results of these high-pressure jets being so much in use is seen in the very marked advance in quality and difference in size of the newer form of lime cylinders now placed in the hands of experienced lanternists; and, although opinions may differ in regard to what is the best form and size of cylinders to employ for ordinary transparency projection (for some authorities maintain that the old size of cylinder — viz., 1½ in. by ¾. — perhaps is in some respects to be preferred to the more modern size of cylinder, which is nearly double the thickness), it is maintained that the smaller size yields less heat with a lesser light spot, and no doubt this assertion is quite well founded. But, on the other hand, when we come to face the difficulty or liability of limes splitting under the action of a powerful jet, then there is no question as to the immense advantage the employment of these larger-sized cylinders confers over that of the smaller limes, and but few operators could now be found who have had much experience in single lantern working, and the employment of these large cinematographic limes or cylinders, who would ever for a moment think of going back to the old ¾.-inch size of cylinder, especially where powerful mixing jets are employed.

The introduction of these cinematographic limes will do much to popularise single lantern working, for they quite remove the main objection hitherto held, viz., the difficulty of making one lime last throughout an entire evening's entertainment.

In limes or their substitutes for lantern projection there, of course, will at all times be a variety in quality no matter what the size of the cylinders are, for there are good and bad of both sizes. An operator, however, who is possessed of a really good large lime cylinder need have no fear of his light giving out during a two hours' exhibition with a powerful mixing jet. On the other hand, a ¾-in. cylinder has frequently to be subjected to an extra boring operation to make it fit the lime pin of his jet, and this tends to weaken the already thin enough surface of the lime to such an extent as to make it very liable to fracture under the heat of the blowpipe.

On the score of durability there is no doubt the advantage lies in the employment of the larger-sized cylinders.

It has, however, been urged that these large limes give a much greater heat, and are more liable to cause a condenser to be fractured, than smaller sizes. This objection, however, is easily met by employing condensers of slightly longer foci than those generally in use in single lanterns. The use of such long-focus condensers need not necessarily imply any loss of light as many lanternists are given to understand as likely to follow their employment, for the extra pressure obtainable by modern mixing jets when used in conjunction with the limes that are capable of withstanding the extra blast of the blowpipe enables a much more powerful light to be employed.

The fracturing of a condenser is another very exasperating circumstance during a single-lantern entertainment, and is an event that is liable to happen to any operator.

There is no doubt, however, it is less likely to happen where condensers are carefully selected in regard to their focal length, being slightly longer when powerful jets and larger lime cylinders are employed. It is well known that a jet employed with a twelve-inch objective requires to be worked at a much closer proximity to the back combination of a condenser than is the case where objectives of much shorter foci are being used, and this is another point in favour of the employment of the longest possible focus in a condenser.

To enable a single lantern, therefore, being used with quite satisfactory results for, say, a period of one and a half hours straight on and where powerful mixing jets are required, a distinct advantage is gained by the employment of large, hard lime cylinders, and having the lamp fitted with the longest possible focus condensers that can be used in relation to the focal length of the objective employed.

On the score of comfort and ease of working a single lantern as against a double decker, the advantage is very great with the former, and, when it is used in conjunction with a good mechanical carrier, not the universal right-and-left or see-saw pattern, but a carrier that not only registers each slide exactly, but at the same time ensures every slide being in exact focus, as well as yielding as nearly as possible a true dissolving effect, then we are in a position to give a single-lantern entertainment of a very high order, and one that need not occasion the slightest fear of a breakdown from any of the causes so much dreaded in former years.

T. N. ARMSTRONG.

FERROUS OXALATE FOR LANTERN SLIDES.

THE iron developer for lantern slides is seldom recommended so strongly as we find in a recently published article on the subject by Mr. H. A. Van Dusen. That gentleman points out that it is almost universally acknowledged that a first-class lantern slide from a gelatine plate requires much experience and skill on the part of the operator.

There is, he adds, an inherent peculiarity in gelatine which makes it not specially suited for giving clear high lights, which is what one really desires in a slide, despite the artistic twaddle about the beauty of veiled lights.

Brilliancy is the great *desideratum* in slide-making if one has any intention of showing his slides upon a screen. The opalescence of the gelatine may, it is true, add to the artistic effect in a window transparency or on a slide intended to be viewed like a transparency in the graphoscope, but any haziness would condemn a slide intended for exhibition.

A gelatine slide ought to be properly exposed and properly developed if you expect it to be considered by a judge good.

Any doctoring in the shape of reduction, or intensification, or even toning, is but a makeshift.

Endeavour, therefore, to get correct exposures, and to do this you must study your negatives, for upon the character of the negatives the tone of the slide depends. True, long exposure is liable to give warmer tones, but there is really very little latitude of exposure allowable in judging time on a slide.

A very light excess of exposure will cause a blurring or slight solarisation in the intense lights, which would amount to *nil* in a negative, but which on projection is greatly exaggerated, amounting to a smudge or smear.

The tone of a properly exposed slide is satisfactory enough without any subsequent modification.

Though there are many developers which act most energetically and beautifully in the making of negatives, he has never found anything equal to ferrous-oxalate developer for slide work.

A.

Oxalate of potash	2 ounces (av.).
Chloride of ammonium	40 grains.
Water	20 ounces.

B.

Sulphate of iron (cryst.)	4 drachms (av.).
Citric acid	2 "
Water	20 ounces.

C.

Bromide of potassium	1 ounce.
Water	3 ounces.
Sugar	1 drachm.

Take equal parts of A and B, and add 5 minimis of C to each ounce of mixed developer.

It will be noticed that this oxalate developer is very much weaker than that which was formerly used for negative work, and that the amount of acid is also in excess.

The acid and sugar act as retarders of the developing action, that is, slow it, while the bromide acts as a restrainer.

If the development should need acceleration, make use of a stronger oxalate and iron solution; that is, the above with only one-fourth the amount of water.

Add a little of this strong solution to the developer to expedite the appearance of the image.

Of course, do not presume that you may over-expose, and modify in the development the density on the image, for correct exposure must be aimed at, and the endeavour made to adjust the developer to the exposure, the stock solution of mixed ferrous oxalate being intended as a means to this end. It is only in this way that brilliancy of results may be attained.

It may perhaps be necessary to mention here, that in mixing the developer for use the iron should always be added to the oxalate solution, never the oxalate to the iron. This latter procedure would cause muddiness in the solution and practically ruin the developer.

SOME SCIENTIFIC APPLICATIONS OF ANIMATED PHOTOGRAPHY.

MR. C. FRANCIS JENKINS, the well-known American authority on animated photography, has published some very interesting particulars relating to the uses which science derives from this branch of photographic production.

For example, he says the U. S. Department of Agriculture is using a new instrument, technically known as the Phantoscope, for the study of plant growth. A description of the first experiment will serve to explain the application. The camera was anchored in front to a tomato plant just sprouting, and for weeks, by means of a simple clock attachment, which closed and opened an electric circuit, an exposure every half-hour, day and night, was made. The resultant ribbon is run through the Phantoscope, and the thousands of pictures are made to appear inseparably on a large canvas. Each onlooker sees the young shoot spring up, sees it grow, sees its leaves unfold, sees it put forth blossom and fruit, all in the space of a few minutes. Many fascinating discoveries are confidently expected by thus being able to accelerate the record of plant growth from three months to three minutes. For example, it is proved that the plant sleeps at night, this being shown by the intermittent growth on the canvas. The effect of stimuli and disease is also shown.

Obviously there are almost infinite possibilities for the utilisation of the method. The entomologist can reproduce the winding of the cocoon by the caterpillar as rapidly as the bobbin in a silk mill, can show the opening of the chrysalis in the spring, and, by combining the X-ray apparatus and the Phantoscope, can show the exact movements of the butterfly in his efforts to liberate himself.

The reverse, retardation, is even more prolific of interesting results. Comparatively little is known of insect and bird flight, because the wing movement is too rapid for the eye to detect the mechanical action. But with the new machine it is possible to take above 30,000 pictures per minute, the while giving to each full-timed illumination. By the synthetical process employed, the wings are reproduced in action at a rate one-twentieth as fast as taken. The flapping of wings can therefore easily be followed and the motion watched. In a study of fast-moving mechanism, soaring and falling bodies, data are procured invaluable in a solution of the problem of aerial navigation. Professor Muybridge did wonderful work in correcting accepted notions of the leg action of a trotting horse, but only partial results were achieved in bird flight, as analysis only, and not synthesis, was attempted.

The instrument, continues Mr. Jenkins, is invaluable in ethnological field work, making permanent records of Indian ceremonies, domestic arts and employments, primitive modes of living, etc., all of which, it will be conceded, are rapidly being lost or contaminated by a theatrical effect introduced for the benefit of the whites. These ribbons preserve in their integrity these ceremonies to all posterity.

The initial and subsequent trials of the battleship models in the experimental basin in the Washington Navy Yard may be made, each record preserved for comparison with the subsequent behaviour of the same model or of other and improved patterns. This method will, doubtless, sooner or later, be adopted by yacht-builders for the same purpose.

Such ribbons are also invaluable for demonstration before committees of Congress to more readily secure appropriations of moneys for desirable purposes. The eye can read in pictures in five minutes what would require hours for the ear to grasp, and with more convincing argument.

These methods of object-teaching prove not only of interest to the scientific investigator, but of inestimable value in the teaching of science to the children. The lantern has long been utilised in public instruction, but is now outstripped in effectiveness by the new device. On a large canvas, before the entire school, can be shown the growth of plants, the opening of flower petals, the passing of the seasons, the diurnal progress of the sun, the birth of the butterfly, the hatching of chickens, snakes shedding their skins, the flow of blood in the arteries, the transit of Venus across the solar disc, and other subjects yet to be arranged for.

The instrument has also been pressed into use in an effort to open up avenues of education for mutes. A hundred assemblies may be addressed by the same speaker, at the same moment, and in as many different places. Thus, one sits before the camera repeating the words of the address, that is, talks to the camera, the latter meanwhile making a permanent record of the lecture in the form of a great number of separate photographs on a long ribbon. Subsequently this ribbon is to be run through a proper projecting machine, which reproduces them on a large canvas in such manner as to appear to the eye a single portrait with lips moving in intelligible speech.

The hourly Weather Bureau reports for the year, when made up into a long ribbon and reproduced on the canvas, show the shifting of the "highs" and "lows," and the making, progress, and duration of areas of humidity, of high winds, cyclones, and the like. It is confidently believed that lessons will be learned therefrom which will guarantee still more accurate weather forecasts, resulting in incalculable benefit to shipping, to maritime, and other interests.

It has even been suggested by a scientist of recognised standing, that in the near future, with a combination of the Phantoscope and improved X-ray apparatus, that human life from conception to birth may be shown, for the possibilities of invention or discovery may not be gauged with cold reason.

By means of special Phantoscopic apparatus and colour filters, much of this work can be reproduced in natural colour and stereoscopic relief, a desirable though somewhat costly process. A water-melon, for instance, is photographed with a compound camera using four ribbons, in front of three of which respectively a red, yellow, and blue colour filter is located. The exposures are made hourly from the time the first shoot springs from the ground until the fruit matures. The positives are projected in a special lantern through colour screens. The composite picture is viewed with the left eye while the right simultaneously looks at the untinted picture, which appears side by side with the coloured pictures. This produces a stereoscopic effect, at the same time the picture appears in natural colour. The colour process is, in reality, the Ives's process, modified to suit the special requirements of the case.

Each onlooker, being provided with a neat little binocular eyepiece for diverging the lines of vision, sees upon the screen a green shoot spring up, sees it grow, sees the leaves unfold along its sinuous length, sees it blossom and develop the melon, the luscious red heart of which is exposed to view by the nocturnal coloured visitor. Not only to the layman is the picture one of beauty in form and colour, but one of great interest to the botanist in determining the periods and rates of colour change.

The perfected Phantoscope is, therefore, simply a scientific mechanism for reproducing the physical phenomena of life and action, by which, in colour, form, and motion, every aspect of a fact may be seized and reproduced at will, with all the depth and atmosphere of stereoscopic vision.

THE DANGER OF FLASH LIGHTS.

NOTWITHSTANDING the number of serious accidents that have been chronicled, and the cautions given as to the dangerous character of most of the flashlight compositions, mishaps are continually occurring. We read of one that recently happened in a studio at St. Louis, which may serve as a warning to those who compound their own flashlight powders here. Briefly, the facts are these: An operator was using the blade of a knife to mix a quantity of Blitz powder and magnesium together, when the compound ignited, with the result that the man was terribly burnt about the face, hands, and arms, and had to be removed on an ambulance to the City Infirmary, where his condition was found to be serious. It was also stated that some of the white-hot flame had been inhaled by him, which, of course, added greatly to the gravity of the case.

We have on several previous occasions warned those who make flashlight powder, containing chlorate of potash and the like, as to the way that the compounds should be mixed. They should be dried and pulverised separately, then mixed in small quantities at a time, as required for use, on a sheet of paper, using a strip of stout paper or thin cardboard for the purpose. Had this method been adopted in the St. Louis studio, the accident would not have happened. There the operator used the blade of a knife for the purpose, probably because it was more convenient. Here is one more caution we would give: When mixing the ingredients in ever such small quantities, do it at arm's length, because then, if the mixture does ignite, the operator's face will not be injured by the flame, as in the case just cited, for most of these compounds are liable at times to "play tricks," and go off when least expected. Our object in specially calling attention to this accident is to once more impress the necessity of extreme caution upon those of our readers who may not know the dangerous nature of the material they are dealing with when they compound their own flashlight powders.

PRACTICAL THREE-COLOUR LANTERN-SLIDE MAKING.

[Paper read before the Royal Photographic Society.]

THE subject of photography in colour is one which always seems to arouse some interest, and, although we have had methods of taking photographs in colour for over thirty years, we have seen very little of the actual work, especially in the case of lantern lectures. I want to-night to describe to you a practical method of making slides in natural colours, and of using them in an ordinary lantern.

You know that very much has been done in colour photography by various workers, from the time of Clerk-Maxwell in 1861, Du Haunen

since 1868, F. E. Ives from 1887 to the present time, and many others. Mr. Ives's process, now upon the market as you know, relies on the triple lantern for combining the images; it is a strictly scientific process, based upon Clerk-Maxwell's measurements of 1861, and some of the results that he has shown before this Society would be very hard to beat. But there is one disadvantage of the triple lantern, and that is there is such an enormous loss of light; and what I have been endeavouring to do is to place in the hands of lecturers, and especially of amateurs, a simple means of making natural colour photographs which can be shown upon the screen by an ordinary lantern.

The first thing we have to consider in connexion with colour photography is the nature of colour itself.

Experiments with White Light and the Spectrum.—The three-colour process is based upon the fact that all the colours of nature may be counterfeited sufficiently nearly to deceive the human eye, by means of mixtures of three colours of the spectrum itself, a particular red, a particular green, and a particular blue-violet. In order to see a coloured object properly, we have to illuminate it by white light, and white light contains light of all colours. Our first experiment, then, should be to separate white light into its component colours, and then we must find out what colours we are to photograph our object in.

It therefore appears that, if we photograph the separate parts of the picture through colour filters, print from the negatives in transparent pigments, and superpose the prints, we should be able to get a photograph in natural colour, but there complication commences to come in. You know that in the early days all our photographs were taken by blue and violet light, the light of the ultra-violet end of the spectrum. The first step towards making colour photography practical was when Captain Abney, Dr. Eder, and others started sensitising photographic plates for the red and green of the spectrum, and I will now show you two negatives, one taken on an ordinary plate and the other on the latest form of Cadett spectrum plate. You will notice that in the ordinary plate the action of the spectrum ends in the green, whereas in the spectrum plate there is action right up into the red.

The next thing we have to do is to find out what mixtures of the primary red, green, and blue-violet reproduction colours will reproduce the spectrum as we see it in the spectroscope. The first actual measurements to this end were made by Clerk-Maxwell in 1861, and various other able experimenters have remeasured his results, the latest being Captain Abney. Actual practice with screens made to match Maxwell's curves has shown that it is necessary to make some slight alterations, and I hope that, when Captain Abney's curves are finally revised and published, we shall find that the alterations that have been made in practice will fall in with his actual measurements, because it is only by actual measurement that we can hope to get really accurate results.

Next I show you Maxwell's primary red, green, and blue-violet, and also the colour filters that we use for taking the photographs. The three photographs of the subject are taken through three of these colour filters. The next slide will show the effect of these filters on an actual object.

Here we have three photographs of a series of colour patches, white, red, green, blue, and yellow. The red patch is, as you see, represented as a dense deposit only in the negative taken through the red filter; the green patch is a yellowish-green, and as we saw just now that the red and green form yellow, we have slight action in the red and most of the action in the green filter negative; the blue is greenish-blue, and we get it represented by slight action in the green and considerable action in the blue filter negative; the yellow patch is represented by full action in the red and full action in the green filter negatives, the white patch being represented by equal density in all three negatives. In Mr. Ives's process he took negatives something like these and from them made positives in black; he then placed the three positives in three lanterns, or in a triple lantern, provided with red, green, and blue colour filters, and projected them on the screen, and in that way he secured pictures in colour by the screening out by the black and white positives of varying amounts of the coloured lights, the three coloured lights combining to form white. When we turn to printing in three transparent pigments, so as to superimpose them, we are doing an entirely different thing; instead of mixing coloured lights we are adding the absorption of one print to the absorption of two others, and for that reason we must not use the colours that Mr. Ives used, but these colours that I show you. They are really the colours used to form Maxwell's reconstituted white light, minus one of its constituents, and may be properly called minus red, minus green, and minus blue. By the combined absorption of the blue and the yellow we get green, by the combined absorptions of the magenta and the yellow we get red, by the combined absorptions of the magenta and the greenish-blue we get blue-violet, the absorption of all three gives black, so that, if we can print in those three colours, we ought to be able to secure a reproduction of the object photographed. Here is an actual print stained with the pink dye—minus green, one stained with the yellow dye—minus blue, and one stained with the greenish-blue dye or minus red, and when they are superposed you will see that the object is shown in its natural colours. I will pass through the lantern a few of the slides, and then explain how the prints are made.

[A number of slides in colour were shown.]

I will now show you the three filters through which the negatives are taken. The accurate manufacture of these filters has been made com-

mercially possible by aid of Captain Abney's Colour Sensitometer. I believe that the great impetus which has been given to the correct photography of colour, either as colour or as black and white, is largely owing to this invention. If we attempt to make filters in the way that we did before this instrument was invented, we have to photograph the spectrum through the particular filter under test on the plate we propose to use, and then every negative has to be measured. The measurement of a spectrum negative is a very difficult subject, and even when you have all the apparatus set up you may be two or three hours measuring a single negative, and, as it may be necessary to take several dozen or more negatives with each filter before we get it correct, you will see that the problem of making accurate filters by the old method was out of the question. Captain Abney's method is to accurately measure the luminosities and colour composition of several coloured glasses embracing a large portion of the spectrum in terms of Clerk-Maxwell's reproduction colours, and then to make three sectors to rotate in front of the row of glasses, one for each filter, red, green, and blue-violet, with apertures cut so as to bring the various proportions of one of the standard reproduction colours contained in the various test glasses to a common unit—the smallest proportion of that colour in the series of glasses. Once we have this row of coloured glasses set up and the rotating sectors made, we have a ready means of finding out the perfection of our filters, because we have only to get all the colour patches represented in the negative by equal density upon the particular plate we propose to use to ensure having the filters correct. This invention has enabled the testing of filters for commercial purposes to be carried out in a very short time. The scheme is so excellent, and so little notice seems to have been taken of it, that I do not think we fully appreciate the enormous importance of this invention of Captain Abney's.

Then we come to the question of how to use the filters. The simplest means of using them is, of course, to put them in front of your lens and take your pictures upon plates in the ordinary dark slides; but you will very soon find that this method is impracticable. Changing the filters and changing the slides is a very troublesome process, and you are very liable to get the images shifted in doing it. The first attempt that was made to facilitate matters in this respect was to use the old repeating back; instead of mounting the screens in front of the lens, a long plate-holder was provided for holding all the plates and the screens, and it was shifted along to make each separate exposure. That was a great improvement, because it enabled us to change the screens and the dark slide at the same time, and it is possible with the modern Cadett spectrum plate to get all three exposures made within a minute. Next there were various attempts, principally by French inventors, to get all three exposures made at one time. One of the first of these, and one of the simplest, was a device of Du Hauron's, which he invented in 1868 or 1869, and of which I show you a diagram.

Du Hauron and Cros devised many other means of combination, including a double-step photo-chromoscope with three mirrors, which was afterwards modified by Mr. Ives, by doing away with the third mirror; and I think those who will turn up Du Hauron's and Cros's papers between 1868 and 1879 will find almost all the devices that we know to-day mentioned in one form or another. One difficulty with his camera was that it was necessary to use three plate-holders, and you know how Mr. Ives got over that by means of prisms and transparent mirrors, so as to get all three images on a single plate, and quite recently he has patented another arrangement, of which I will draw a diagram.

I have recently taken the old form of Du Hauron's camera, and got over its worst difficulty. It is necessary that all three negatives should represent white light by equal density, and it is therefore necessary to have some scheme of equalising the light coming to the three images, so that, allowing for the screening action of the colour filters, we shall get equal density for white light in all three negatives. The usual way by which it is attempted to vary the amount of reflection from the mirrors is to vary the amount of silver deposited upon them; but any one who has tried partially silvering glass knows that to make a mirror four inches square, and to get it absolutely free from pinholes, and to reflect a definite proportion of the light, is a very difficult matter. After many attempts in that direction I gave up the idea, and thought of a scheme of using the adjustable diaphragm. I made another colour filter to go in the diaphragm slot of the lens on the plan of the adjustable filter diaphragm I introduced some years ago, some examples of which I see are still hung in a frame on these walls to-night.

I think that with that alteration the old camera of 1868 is as useful and satisfactory an instrument as we could wish for for the purpose.

Having got our three negatives, the next question is to find the easiest way of making transparent prints of the correct absorptions that can be mounted in super-position. One of the best pigments for the blue image is a modified form of Prussian blue. Ordinary Prussian blue toning does not give a particularly transparent image, but by modifying the formula it is possible to get a very transparent greenish-blue image of the right absorption, and therefore an easy way of making the blue print is to make a lantern slide from the red-colour filter negative just the same as you would for an ordinary black-toned lantern slide. It is necessary, however, that the image should be an actual developed image with no "faking" in the way of intensification or reduction, and it is also essential for attaining the correct absorption that the original image

should be a pure black. If you give a long exposure and use bromide and get a warm slide, it is almost impossible to get the correct blue tone, but, by strictly following the development formula that will be given with the apparatus, a good black image will be produced which, upon treatment with the toning solution, will become a rich greenish-blue.

For the pink and yellow prints the best and simplest way is to print upon very thin film by the modified carbon process suggested by Captain Abney. We have made a special film, consisting of pure soluble gelatine containing a small proportion of silver bromide, coated on a very transparent celluloid base, as we did not find the ordinary celluloid films used by Captain Abney a success (the gelatines used for sensitive films being unsuitable for our purpose), and it has to be sensitised in a weak bichromate solution and dried. The gelatine film is very much thinner than that used for ordinary carbon tissue, and the difficulties of drying carbon tissue do not exist with it.

Having the tissue sensitised and dry, we place it in the printing frame in contact with the negative, but instead of putting the gelatine-coated side of the film next the negative, we clean the back of the celluloid and put it in contact with the film side of the negative, so that we print through the thin celluloid film. In that way we get rid of the transfer, and also of the trouble arising from change of size, a further advantage being that the two images are reversed, thereby greatly facilitating the sealing up of the finished prints. All three prints may be made by this method on one long strip of the film. The frame may be opened and the images examined, and after an exposure of about one minute in good daylight you will find that the images are well printed out on the transparent film. The printed-out image is slightly brown, and very much of the same character as the undeveloped platinotype image. No attention should be paid to the strength of the print, but as soon as all the details are out the print is placed in warm water, about 90° F., and in five or six minutes you will find a perfectly developed image. The small amount of bromide of silver is placed in the gelatine film in order, in the first place, to prevent the light getting through and making the film insoluble quite to the back; and, in the second place, in order to be able to see what you are doing, because, if we were printing in colourless gelatine, we should not be able to tell when the image was developed, but the small amount of bromide of silver enables us to see what we are doing. The image being developed, you can place it over a dark surface and see the image in white gelatine.

As soon as development is complete the film is placed in weak hypo, which leaves a colourless cast of the subject. The film is then dried, the three pictures cut apart, and soaked for a few minutes in the staining solutions, which are carefully made up from mixtures of dyes so as to give the right absorptions. The print from the negative taken through the red filter is stained in a greenish-blue solution, or *minus* red; the print from the negative through the green filter is stained in pink solution, or *minus* green; and the print from the negative taken through the blue filter is stained in the yellow solution, or *minus* blue. When the three stained prints are dry, they are placed one over another and you have the final result.

I have mentioned two methods of making the blue print. As you know, celluloid is expensive, and it is economy to make the blue print upon an ordinary lantern plate, because you must have a cover glass, and if you make the blue print on an ordinary lantern plate you have one of the glasses necessary for the finished slide; you then make the other two prints on films, place them in contact and register—they are easy to register—and then fasten them together with binding and a cover glass, and the slide is finished.

That method of binding answers very well where you want to examine the slides in your hand or the stereoscope, or where you are projecting them on a small screen; but, if you want to project them across a wide hall, you will find that the three films will scatter the light considerably. This is easily overcome by cementing the three films together with Canada balsam, and when they are cemented together it is almost impossible to tell whether you have one film or three, the sealed result looks exactly like one piece of glass.

I think this scheme of reproduction is so simple that there ought not to be any difficulty in the average amateur carrying it out; the only thing is to get the necessary materials for it, and these I have endeavoured to supply. The requisite screens, cameras, printing films, and staining solutions will be placed upon the market, and will be obtainable from the usual sources, and I hope that within a short time we shall see a great many of our lectures illustrated by this process. I do not claim that the process is new. I think that we ought all to thoroughly acknowledge the great debt that we owe to the earlier workers in colour photography, and especially Du Hauron and Clerk-Maxwell, Captain Abney, Mr. F. E. Ives, and many others, for it was Clerk-Maxwell who laid the whole foundation of the work we do to-day, and it was only the lax way in which the manufacturers supplied the means that kept back the development of colour photography. I take it that the present increase in the amount of attention that is given to colour photography is due to Captain Abney's colour sensitometer and the endeavours of the plate-makers. The plate-makers have placed in our hands several brands of plates on which we can test these colour photographs, but I do not think that I am going further than I ought in saying one firm have contributed a large share towards this end—

Messrs. Cadett & Neall, of Ashtead. All the work that I have been doing lately has been done on the Cadett spectrum plate. With the Cadett spectrum plate and measured colour filters I think that we should be able to make the negatives with very great ease. A good many persons have attempted this work, but the difficulty of working out filters and finding out the exact way of going to work has been so great that very few have cared to take the time and trouble, but I think that we shall see a great deal more of it now.

With regard to the time of exposure, using the Cadett rapid spectrum plate and the repeating back, you will probably find that in a good light you will have to give an exposure of about ten seconds for the red impression, five seconds for the green, and about one second for the blue; but with the triple camera the exposures on an open landscape would be about two seconds for the three, and I am hoping that Mr. Cadett will still further increase the speed of the spectrum plate, which is already more than twice that of any other brand of orthochromatic plate. It only needs a little more speed to enable us to take coloured animated photographs; there is quite a simple scheme for projecting animated photographs in colours, and, as far as I know, the only thing required to make it a success is a still more rapid spectrum emulsion coated on transparent flexible film.

E. SANGER SHBPHERD.

EXPLOSION AT A CALCIUM CARBIDE WORKS.

SOME time ago an explosion at some calcium carbide works in Ottawa, Canada, took place, and a correspondent of the *Scientific American* has supplied that journal with an account of the circumstances of the accident.

The fire originated in a building adjoining the carbide works, cause unknown.

A hole was cut in the roof of the works directly over a crucible containing about 1000 pounds of molten carbide.

Water from the firemen's hose was poured in through the hole on the upper floor, whence it streamed down into the furnace-room on pigs of carbide lying on the floor, and on a small quantity of broken carbide ready for packing, gas generated from the water dripping on the cold carbide. It was ignited by burning wood falling through the ventilating shaft, and burned quietly as rapidly as it was given off. Suddenly an accumulation of water poured into the crucible on top of the molten carbide. An explosion followed that wrecked the plant and injured eighteen men. The verdict of the jury was that the explosion came from that crucible, but left it an open question as to whether it was caused by the rapid conversion of the water into steam or by water gas formed by the vaporisation of the water on the unfused mixture of coke and lime. The correspondent adds that the expert testimony was all against the possibility of the explosion being acetylene. Such men as Thomas Macfarlane (Analyst for the Department of Inland Revenue), Professor Shutt (Analytical Chemist, Dominion Experimental Farm), Professor McGill (of the Geological Survey), and the men engaged in manufacturing carbide, deposed that it was impossible to generate acetylene from red-hot carbide. Medical evidence as to the injuries from the explosion showed that they were the result of dry heat, not steam. The victims themselves said that the burns came from the hot unfused mixture of lime and coke. Only one injury was serious, resulting in the loss of an eye.

The coroner's verdict has dissipated a great deal of prejudice against carbide. The jury came to the conclusion that its manufacture was not of a hazardous character when conducted in a fireproof building. The City Council, acting on the finding of the jury, have instructed the By-laws Committee to frame a by-law to regulate the manufacture and storage of carbide. They consider this necessary because Ottawa is destined to be the centre of an immense carbide industry. Within the city, and in a radius of forty-five miles, there is over a million horse power in waterfalls, abundance of lime, and easy access to coke and charcoal. In this northern country, where the nights are so long in the fall and winter, acetylene is bound to take a front rank as the poor man's light.

LANTERN LECTURES ON "FAIR DEVON."

IN the dull days of winter some delight comes to the photographer in mentally going over the ground of previous pleasant exploits and in anticipating fresh fields. Next summer may, from a number of causes, see more travel done within the borders of Britain than on the Continent, where, though British money is appreciated, and is, indeed, the cause of much prosperity, the Briton is not a *persona grata*—just now. As a picture ground, with fine climate and most enjoyable weather from April

to October, the county of Devon is, among its residents and those who know it well, worth consideration. Mr. Chas. R. Rowe, who formerly was engaged editorially for a number of years in connexion with our contemporary *Photography*, will next week be lecturing at the Photographic Club, the Camera Club, and the Polytechnic (Regent-street) upon 'Fair Devon,' illustrating the subject with a large number of lantern views. He has always been an enthusiast upon this subject, and he is none the less so now, when he is giving his whole work, by pen and voice, to the matter. He is quite at the service of any amateur photographer or visitor who may desire to know more about Devon, and his address is 17, Bedford-circus, Exeter. Devon has not been an exploited county, and it has never been over-run with the rushing tourist, but it has a magnificent lot of views—of nearly every sort, woodland, moorland, cliff and shore, river, architectural, and remains of bygone ages. It would satisfy the wants of many, while at the same time being easily accessible and readily got over. Those who are thinking—only just the matter of a few minutes' dreaming now and then, maybe—will do well to turn up at one of these lectures.

THE DESIGNOSCOPE.

To project upon a lantern screen the operations of sketching diagrams or pictures, so that an audience may enjoy a full view of the draughtsman's work as he proceeds, calls for but slight additions to the ordinary single lantern. To exhibit in the ordinary way caricature slides originally drawn by clever and renowned cartoonists constitutes all that is necessary to ensure a very good evening's entertainment; but giving the audience the opportunity of seeing such work actually delineated before their own eyes must add substantially to the interest of such a show, whilst the applause, that is not likely to be withheld, cannot fail to encourage the artist in his work.

For the purpose of such projections, the optical adjustment of an

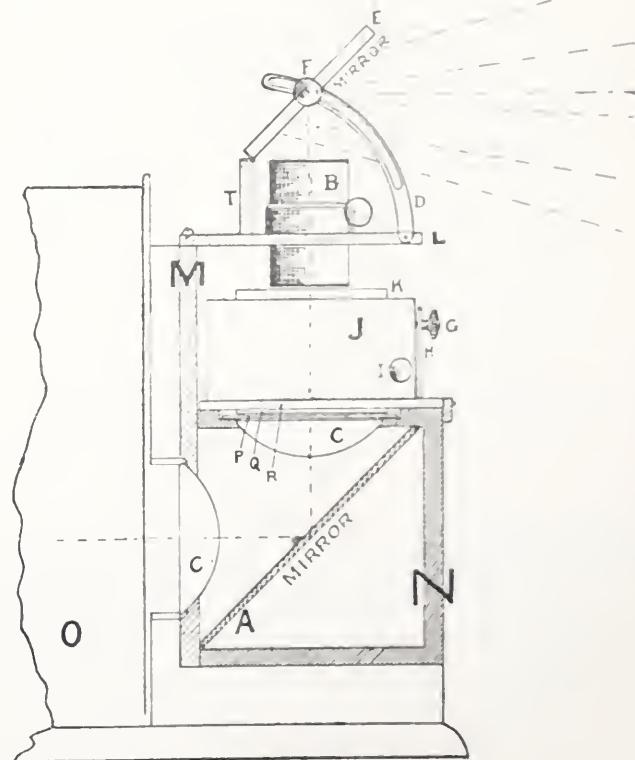


FIG. I.

ordinary single lantern require the following rearrangement: Referring to the diagram (fig. 1) a plate-glass mirror, A, is interposed between the two lenses of the condenser, C C, at an angle of 45°; the light emanating from within the lantern is thus thrown out of its usual course in a perpendicular direction, and then passes through a slide or object-glass situated at R, after which it proceeds through the objective lenses at B, supported by a suitable holder, L. The rays of light finally strike upon a second mirror, E, which is silvered on the front surface, whence they travel to the lantern screen. Hence the slide, instead of being carried through the lantern in a vertical position, as in the ordinary lantern, is laid horizontally upon a suitable framework situated immediately over the second lens of the condenser. By such an alteration in the arrangement of the optical combination it becomes possible to interpose between

the condenser and objective lenses such apparatus necessary to form a desk on which the draughtsman's sketching glasses may be laid, whilst he is enabled to do his work without blocking the course of light by his own person. Thus we have an apparatus, not only useful for the cartoonist, but also for the purpose of demonstrating characters in writing, teaching shorthand, and various scientific facts.

To such an apparatus I propose to add an instrument which I have called the Designoscope, the object of which is to multiply the lines made upon the sketching glass by the draughtsman, and so convert his simple strokes into a beautiful conventional figure upon the screen. All the essential parts of this little instrument are shown in all three of the accompanying figures at G, H, I, J, K, R, and S, fig. 3 showing a view of the instrument as it appears when placed upon the desk and looked at from the under side of the objective lenses.

In each diagram, G, is a thumbscrew for securing at the desired angle the mirror K; H is the wing guide, to which the framed mirror is secured by G. BBEN.

I is a thumbscrew, working in a thread made in the mirror frame, pressing against the back of the mirror glass, and thus keeping it from sliding out of place.

J is a mahogany frame holding mirror, and supported on the base, R, to which it is pivoted.

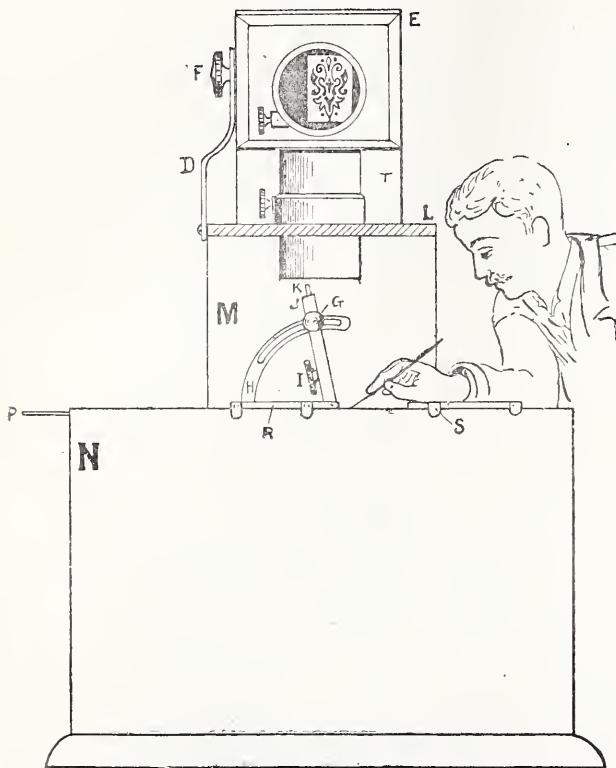


FIG. 2.

K is a mirror made of plate glass with the silver precipitated upon the front surface and burnished.

R is a base, supporting mirror, and acting as a shutter for cutting off superfluous rays, otherwise emanating from a portion of the condenser.

S is an arm rest, forming no part of the instrument itself, but necessary for preventing the operator's sleeves from touching the surface of the sketching glass.

The object-glass, R, consists of a long strip of plate glass, suitably prepared by stippling its upper surface with mountants (Fallowfield's) and allowing it to dry. The ink employed is that usually supplied with rubber stamps, obtainable in red, blue, green, violet, or black. The colour used must be decided by the taste of the operator and also by the subject in hand.

Having adjusted the mirror, J K, so that both sides of the projected image appear equally illuminated, the operator works upon the glass slide, R, from the position shown in fig. 2, with his arm resting upon the bridge, S. In this diagram (*i.e.*, fig. 2) the slide, P, is shown in its position as the artist is drawing his last design. When the first image has been drawn upon the left-hand end of the slide, it is pushed from right to left. This motion will cause the designs upon the screen to fold in the centre and vanish, and a clear space will thus be made for the next design. If, after a series of designs have been completed, the slide upon which they are drawn is pushed from left to right, the designs will appear to spring from the centre, then separate in two, and finally disappear on opposite sides of the illuminated space.

Various effects are produced by using two separate glasses, and, whilst in contact with each other, causing them to move in contrary directions.

A pair of glasses worked in this way, and being painted, one in yellow colours and the other in blue, produces varying shades of green, wherever intersection takes place. Designs etched with a steel point, and removing soot from smoked glasses, produce a very pleasing effect upon the screen. Though in all these operations the draughtsman actually draws but one-half the design, to the audience he appears to be using two hands, drawing both sides of the design at the same moment.

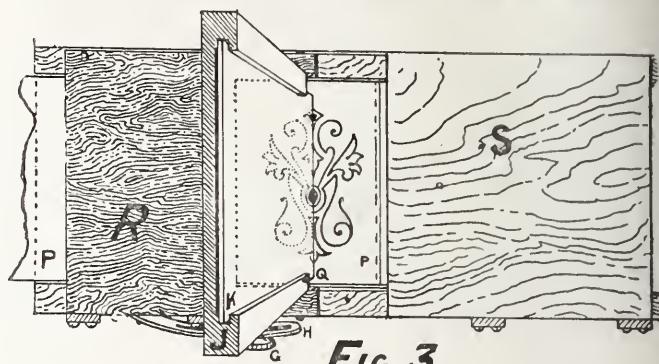


FIG. 3.

It will be remarked that by the addition of a second mirror to the Designoscope, suitably attached so that it has all the necessary adjustable means, a four-sided figure may be projected upon the screen, or figures having even six slides, after the manner of a kaleidoscopic design.

The beauty of the effects obtainable with the Designoscope are not likely to be fully appreciated from a mere description in words, and a practical observation alone can reveal to the reader the great variety of combinations, both in colour and form, that may with advantage be introduced.

THEODORE BROWN.

CARBIDE OF CALCIUM.

A RUSSIAN engineer, Orlowsky, of St. Petersburg, has made an improvement in the manufacture of calcium carbide, which has for effect the prevention of the absorption of damp and the more regular and slower evolution of acetylene when in contact with water. He places the carbide just when it comes from the electric furnace, and, whilst still hot, in a mixture of one part of tar and forty parts of petroleum residues. It is also reported that Herr Wolff, of Berlin, has patented a process for its manufacture which entirely does away with the electric furnace. A compound of lime, carbon, and powdered aluminium is mixed together, and then fired by a slow match or torch. The aluminium, it is said, combines with the oxygen of the quicklime, and the temperature thus caused is so high that the lime melts and combines with the carbon.

MAGNESIUM PAPER.

THE following method of making magnesium paper may be useful to some, as it is easily carried about, and the intensity of the illumination may be regulated by the quantity of paper burnt. Two sheets of paper should be coated with starch paste, and then dusted with powdered magnesium, and the two surfaces pressed into contact. Two sheets are also prepared in a similar manner with powdered chlorate of potash, and then pressed on the outside of the magnesium sheets.

MESSRS. FUERST BROS.' recent cinematograph films include the following : "Departure of Field-Marshal Lord Roberts for South Africa."—His lordship is seen going on board the R.M.S. *Dunottar Castle*, at Southampton. Episodes of the War in the Transvaal : "Arrest of a Boer Spy."—An English Column are resting near Mafeking after an attack upon the Boers. The sentinel stops some people advancing towards the camp, amongst whom is a spy who, when brought up and searched before the officers, is found to be in possession of some plans; he is taken to the front of the camp, an officer rises and commands a company of men to take him off for execution; the men fall into line and leave with the officer. "The Execution of the Boer Spy."—On arriving at the place of execution the spy is immediately shot; he dies heroically, defying the enemies of his country. "A Skirmish near Glencoe."—A detachment of Boers, trying to pass the English outposts, is surprised by a strong English detachment, who, reinforced by two cannons, repulse the Boers, leaving twelve of the enemy slain on the field. "Episodes of the Modder River Battles."—The Boers seize some English cannon, one of which explodes without, however, doing much damage among the victorious Boers. The Boer women load the guns and pass them on to the Burghers. Severe fighting and heavy losses.

MONTHLY SUPPLEMENT

To the "BRITISH JOURNAL OF PHOTOGRAPHY."

[February 2, 1900.

THE LANTERN RECORD.

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LANTERN MEMS.

WHAT has become of the lantern business this season? With the exception of a fair demand for lantern photographs of the scenes of the war, portraits of generals and celebrities in connexion with the South African War, and reproduction of the illustrations in the papers of the battle scenes and incidents, there is little or no demand for lantern work. The explanation, by general consent, is, that ordinary business is quite unhinged, and, although many opticians have had a very busy time in supplying binocular field glasses, telescopes, and compasses for use at the seat of war, other branches of scientific work have been at a stand-still.

* * * * *

If this explanation cannot be considered adequate, then those interested in the optical lantern will have to bestir themselves to bring about a better condition of affairs, as far as trade is concerned. Is it that some novelty is required? The introduction of animated photography, and the biograph and various other graphs, made a great change in the better class of lantern entertainments, and superseded to a large extent dissolving-view entertainments. No doubt the public like realism, and entertainments illustrated by triple lanterns, properly manipulated, such as used to be done by Mr. B. J. Malden, never failed to draw big audiences, but once the taste for moving photographs had become established the dioramic scenes and effects were at a discount.

* * * * *

BEAUTIFUL pictures will always be admired, and, if the effects produced are natural, the audience will always be pleased. Those who have any fine hand-painted and dissolving-view effect slides in their collection will do well to keep them, for they will enhance in value rather than decrease, as the number of first-class slide-painters is very limited, and, from what I can see, will get less. By slide-painters I do not mean those who can colour a photographic transparency, but rather the artist who can draw and paint direct on glass figures in miniature that can be enlarged so as to be seen by a large audience. It is a great gift to be able to draw so that the figure looks real, and not like a doll, or without anatomical form.

* * * * *

FORTUNATELY in landscapes and with scenes of travels, celebrated buildings, &c., photography still helps us to a large extent, and many beautiful effects of day and night for dissolving are now published

that never fail to be appreciated. If what lantern-makers and slide-producers are feeling now is not explained by the war scare, then some attractive novelties will have to be added to the optical lantern, and entertainments given with its aid to bring about a better condition of affairs. It is probably only a temporary wave, and, when peace is restored, then the optical lantern will once more take the position it is entitled to, and to which it was exalted some years ago.

* * * * *

As many lanterns as ever, if not more, are used for teaching purposes, but what seems to be different is the reduction in the number of private gentlemen who take to the lantern as a hobby. I sometimes think that the institutions, or churches, chapels, &c., which have benefited by the entertainments given by lantern amateurs have not had a representative to give the proper acknowledgment for the trouble and pains taken to bring about a successful result; in fact in some instances, they look upon the operator, who very often gives services voluntarily, as a mere showman. In the case of a siu he has simply to walk into the hall with a roll of music under his ar and, when the time comes, sing his song; but with the lantern operator it means a great amount of thought, and generally real hard work, to bring about the desired result, besides a lot of preliminary practice. If all this is appreciated at its proper worth, well and good, for, no doubt, a properly carried-out lantern entertainment is a great attraction, and the means of affording pleasure to a large number.

* * * * *

ANOTHER way of looking at the business side of the matter is that so many societies have their own lantern: and, in fact, the greater portion of them must be now supplied: hence the demand in that quarter must be getting less, while the members know they have only to take their transparencies to the society or club, and they can have them shown on the screen to their own or the members' edification.

* * * * *

WHAT can be done in the way of novelties for the lantern? I should like to see some advance made in the Aphengescope, or opaque lantern, and the lantern microscope brought more to the front; the long-desired and often-tried stereoscopic projection to be perfected and rendered possible or easy of attainment, in ordinary halls and with average audiences, without each having to be provided with special adjuncts, or only such as will be useful for other purposes, such as an opera-glass. The stereoscopic projection by polarisation, so to speak, deserved the praise it received at the time Mr. Anderton invented it and introduced it to the scientific world; but, as a commercial venture, I fear it has not "caught on." It may help towards the ultimate achievement, but the ideal projection will have to be as clear as that of an ordinary photographic view as shown by the single optical lantern, and perfect stereoscopic effect as seen in the hand stereoscope.

G. R. BAKER.

LANTERN MATTERS.

LIMES.

BUT few lanternists having any experience will be found who are not alive to the fact that, in every description of limelight projection, the question as to the quality as well as form of the limes employed is one of the first importance.

Since the earlier days of limelight projection when gases were used in a mixed condition under pressure from one bag, and then, later again, when increased safety was assured by storing the gases in separate bags, down to the present almost perfect system of working from high-pressure cylinders, but little alteration can be said to have been effected in regard to the limes employed during these different stages, and very many of the older handbooks and guides to lantern projection are still read as up-to-date authorities in this particular item connected with the limelight, notwithstanding that, during the last five years, quite a revolution may be said to have taken place in "optical projection." That much of what may be termed a distinct advance is attributable to the newer form of mixing jets, which in their turn have been designed by reason of the increased pressure derived by working from cylinders, is a fact patent to every one conversant with lantern displays, for the increased or practically unlimited pressure from cylinders has given us jets quite different in design, as well as those containing chambers packed to such an extent as would have rendered their employment quite out of the question in the old gas-bag days. Yet it is very questionable if a corresponding improvement has been effected in the matter of our limes and the method of using them, for many of our modern powerful jets are sorely handicapped, and seldom seen working to their best advantage, by reason of the failure of the limes employed to withstand the extreme blast from these powerful jets.

Twenty-six years ago, in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, under date January 23, 1874, there were given two illustrations of what at that time appeared to be the most serviceable form of lime cylinders to employ, and it is interesting, in these days of high-pressure working, to refer to the form of limes and method of using same advocated by Mr. Noton at that distant date, for the question naturally arises, if some similar method would not at the present day be well adapted for use with the powerful jets employed in cinematographic and other long-distance limelight projection.

Mr. Noton advocated the employment of solid cylinders of lime, one and a half inches in length by five-eighths in diameter. These cylinders, however, were manufactured without any bore down their centre, so that they could not be used with a jet furnished with the ordinary lime pin. This, however, was not his idea of how such cylinders ought to be held *in situ*, for Mr. Noton made a distinct feature of his method of employing solid cylinders by substituting for the lime pin a semi-circular trough or gutter, into which the solid cylinder was laid horizontally in a line with the axis of the lenses. This permitted the ends of the lime being exposed to the flame of the blow-pipe, and, as this trough or gutter was supported on a spindle capable of being rapidly rotated in its socket, either end of the lime cylinder was capable of being exposed to the flame, and Mr. Noton at the time remarked that, when any pitting of a lime at one end took place, by rotating the spindle the back of the gutter brought the used end of the lime into such a position as permitted its being scraped to a fresh flat surface again. Of course, at that distant date, the pressure employed was nothing like we use at the present time, and the limes were manufactured by Mr. Noton himself and, doubtless were of a very soft quality, but in this early experiment have we not the germs of what might be converted into an improvement in connexion with present-day practice?

As is well known, more recent improvements took the form of boring the lime cylinders, so that they could be used vertically on the lime pin, and this for many years has been the form invariably employed, simply because by rotating the screw of the jet a fresh part of the surface of the cylinder is brought opposite the flame, and, so long as the power of the jet employed was such as did not overcome the wall of the lime cylinder, this method of rotating a lime proved quite efficient; but, as has been stated during recent years, the increased power of modern jets becomes very destructive to the older forms of lime cylinders, and those of small dimensions are now found quite useless when used in conjunction with a really high-power jet.

A by no means uncommon size of lime cylinder is that of three-quarters of an inch in diameter, by one inch and five-eighths in length, down the centre of which runs a bore of one-eighth of an inch for attachment on the lime pin, and with this particular form and size of lime cylinder it is claimed Professor Faraday obtained the most brilliant light. The writer,

however, would suggest that, however admirable such may have proved in the past when employed with what may be termed low-pressure jets, the same would not be employed by any practical lanternist who appreciated the difficulty of keeping a steady light, say of one thousand candle power, straight on end in a single lantern for a period of one and a half hours, a requirement by no means uncommon at the present day.

It by no means follows, however, that circumstances would not arise in which such dimensions of lime cylinders would be preferable to those of greater diameter, for there is no question, when it comes to be a matter of selecting the best size and form of lime for use in such a lantern as, say, a bi-unial, where rapid dissolving has to be effected, then these limes, with their thinner walls and smaller heating surface, become very effective, for they unquestionably permit of a more ready response to the incandescent stage, which is a matter of much importance when dissolving effects are being rendered, and, of course, with bi-unial lanterns there is never the anxiety about changing a lime that is the case with single lamps. And here we have just a case in point where an operator's experience will guide him in the selection of the proper form and size of lime for the particular class of projection he is about to undertake.

With the introduction of modern powerful jets, more especially designed for cinematographic projection, it has been found necessary to increase the diameter of the cylinders; and these for some time have been manufactured up to one inch and a quarter in diameter, and this size has worked satisfactorily with powerful jets, the increased thickness standing the strong blast of the blow-pipe fairly well for a considerable time, provided the limes are in good condition, and in these limes the bore is slightly less than in those of former years; for speed in dissolving, however, they do not permit of a sufficiently rapid incandescent spot being reached, but for any single lantern work, where a continuous steady light is a *sine-quâ-non*, they are indispensable.

Against their use it has been urged that they are destructive to condensers by reason of the extreme heat they generate, doubtless by not allowing the flame to pass so readily around them as a lesser cylinder in diameter will permit; and not a few experienced operators decline to use them for this reason alone, preferring an intermediate size of cylinder, viz., those of one inch in diameter, and in which the bore for the lime pin is just sufficient to allow of its being attached to the jet, so that the walls of the cylinder are not weakened to any extent. It is claimed that this size of cylinder yields splendid results, and that such are a distinct improvement over those of one and a quarter inches in diameter.

In using these limes, an operator should never be tempted to tamper with the bores of the cylinder, for the common practice of boring out the hole for the lime pin is one that should be discountenanced at all costs. Such a practice never fails to weaken the walls of the lime, and to this treatment nine out of every ten break-downs during work is attributable.

For many years the lime pins of our jets were too large in relation to the size of the cylinders used, and it was nearly always the custom to widen the bores by means of a penknife or other equally unsuitable tool. Modern jets, however, do not possess this fault to the same extent, and any jet whose lime pin is too thick to permit of the bore of a standard lime easily passing over it should have the pin reduced rather than resort to the opening up of the bore of the lime, which never fails to weaken the walls of the same.

The above remarks, of course, refer to the employment of mixed gases under pressure. In cases where a blow-through form of jet is employed, the question of a lime giving out during an entertainment is quite as important, and seeing, as a rule, softer grades of limes are employed for blow-through work, a good deal of trouble is met with in this form of jet likewise.

Experienced lanternists, however, seldom favour the use of very soft limes, or, for that matter, use a blow-through form of jet at all. They pin their faith to the mixed jet, which is quite as safe and far easier to manipulate than the so-called safety, with its yards upon yards of rubber tubing connected at ever-varying distances, oftentimes over the heads of their audience as well as under their feet and which proves so attractive to many of our juveniles as tempts them to pinch, and, at times, give a show away.

T. N. ARMSTRONG.

WANTED AN OLD LANTERN: AN APPEAL.

In the JOURNAL for October 13 last, we printed the following appeal from the Head Master of the Orange-street Board School, Southwark, London, S.E.: "In this large Board school, situated at the very centre of the most poverty-stricken district of London, we find great difficulty in attracting the poor lads and interesting them in their lessons. They

to work before, between, and after school hours, and have no opportunity for relaxation or self-improvement out of school. I have induced the School Board to fit one of my rooms with cased-in black blinds, and am striving to awaken an intelligent interest among the boys by the free use of lantern lessons, but the slides at my disposal are very limited in number and range of subject. I am sure many of your readers have slides (or negatives from which I can make slides) of places possessing geographical, historical, or Biblical interest, or illustrating geographical arms, industries, &c., for which they have no further use, but which would be of great value for my purpose. I shall be most thankful to receive any which the kindness of your readers may induce them to send. I should also be glad of any discarded lantern large enough to allow the use of incandescent light (my own iron one being unsuitable), or lantern-slide making apparatus, and would gladly pay carriage if desired."

A week ago we were enabled, by the kindness of Mr. J. Bushby, of Penrith, to hand over some sixty or seventy excellent lantern slides to the Head Master of the school, who writes us on the subject as follows:—

"I am greatly obliged by your kindness in giving publicity to my appeal, but regret to say that up to the present the results have been rather disappointing.

"I have only received two packets of slides, and no one seems to have an old-fashioned large-bodied lantern to spare.

"I thought that, as they are of little use for modern exhibition purposes owing to lack of portability, &c., many must be thrown aside as mere lumber, and one would be of the greatest use to me as a fixture in my lantern room.

"I should be glad if you could spare the time to call on me here, to see what great assistance lantern pictures are in my school work and how I utilise them for nearly every subject of instruction."

We are sorry that the appeal met with so little success. It has, however, occurred to us that, by once more making it public, a selection of slides, and an old lantern, may be forthcoming from those of our readers who have no further use for them. In entertaining and instructing the poor children of the Orange-street Board School they would be put to the best possible uses.

RÖNTGEN WORK IN SOUTH AFRICA:

DR. HALL-EDWARDS TO GO TO THE FRONT.

We understand that Mr. J. F. Hall-Edwards, surgical radiographer to the General Hospital, Birmingham, has been appointed X-ray expert and surgical photographer to the hospital of the Imperial Yeomanry at Cape-town. Mr. Hall-Edwards was the first to obtain X-ray photographs in Birmingham after the promulgation of Röntgen's discovery, and the first in the kingdom to utilise the rays to facilitate surgical operations. He has devised a portable Röntgen-ray apparatus for use on the battle-field, but his present appointment is for service in the base hospital. The department of which he will take charge at Capetown will not only use the X rays as an aid to surgery, but will keep systematic records, by means of ordinary photography, of the cases treated. These will serve not only for immediate utility, but will be of permanent utility in the literature of military surgery. Mr. Hall-Edwards was sent for to the War Office a week or two ago, and some negotiations had taken place with regard to a possible appointment in connexion with the army hospitals, when he received the offer from Mr. A. D. Fripp, who attended the Prince of Wales after the accident to His Royal Highness's knee, and who is the leading civilian member of the Imperial Yeomanry surgical staff. The appointment was confirmed last week in London, and Mr. Hall-Edwards returned to Birmingham to prepare for his departure for the Cape with the rest of the staff, on February 5, in the *Majestic*. It is understood that the appointment at the General Hospital will be kept open for him until his return. Two sets of X-ray apparatus have already been given for use with the Imperial Yeomanry. An appeal is now being made for ordinary photographic apparatus and material, including cameras, plates, chemicals, and portable dark rooms. Another gift that would be specially welcomed is a dynamo to light the operating theatre.

A COMPACT ENLARGING APPARATUS.

Most of us, during our photographic career, have been seized with the desire to make enlarged prints from some of our negatives. Some have attempted it, with more or less gratifying results. Others probably have hesitated from various reasons, perhaps lack of funds, or imaginary difficulties of the process. To the latter I would venture to dedicate this short article.

I do not intend to go into the principles of enlarging. This subject

has been written upon so many times that it would be superfluous to go over the ground again. I shall therefore simply confine myself to giving a brief description of an apparatus I made for the purpose, trusting it may be the means of leading some reader to try this most fascinating branch of photography.

I do not claim originality for the idea, which is simply this: The negative is placed in the back of the camera, illuminated by gas enclosed in a box, the image being thrown on to a board, which can be moved to and from the lens as required. My way of carrying out the idea may, however, differ slightly from the usual methods adopted. It has, however, the advantage of cheapness, for, beyond cost of the three

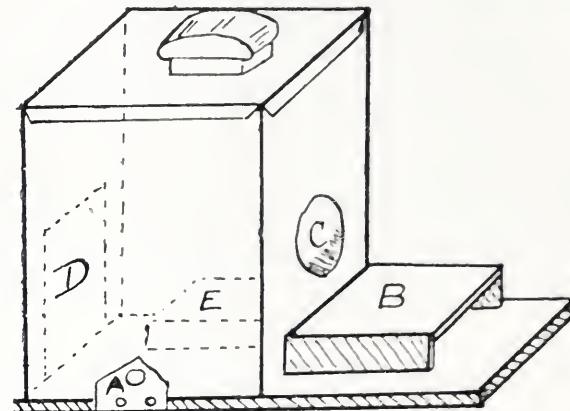


FIG. 1.

articles I shall shortly mention, the expenditure will be found very trifling. It can also be packed away in a comparatively small space, a great desideratum to amateurs who are unable to keep a separate room for their photography.

The most satisfactory way of illuminating the negative, so far as my experience goes, is with a condenser. Of course, daylight can be used, and is perhaps better with a dense negative, but it is so uncertain in its actinic value that it is necessary to test each exposure, whereas, with artificial light, having once ascertained the necessary exposure, any number of copies can be made with more certain results. Moreover, most amateurs have to do their work in the evening, and are therefore compelled to use artificial light.

At the outset I may as well state the principal articles it will be

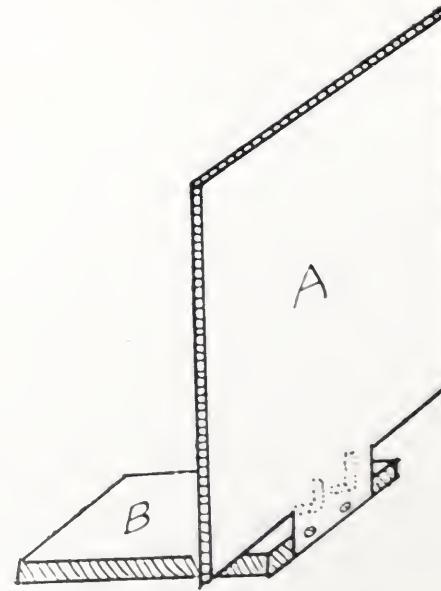


FIG. 2.

necessary to purchase, unless the reader happens to be possessed of a lantern. They are these: A condenser, an incandescent burner, and a lantern tray and jet to carry the burner. Of course a large condenser is preferable, but they cost a considerable sum. The ordinary 4-inch condenser used with the lantern will, however, be found to answer the purpose. If a half-plate view is to be enlarged, it will be necessary to make a reduced negative—a form of procedure which does not seem to have any appreciable effect on the resulting enlargement. The one thing to aim at is to get both the reduced positive and negative with plenty of detail, and not too dense.

We will first of all make the box to contain the illuminant (fig. 1). It

is a great convenience to make this to occupy as small a space as possible. I therefore selected millboard for the purpose, and made the box collapsible. The size is immaterial, so long as it is large enough. A convenient size is about 14 inches high by 12 inches long, and about 9 inches in width. Cut two pieces of millboard 14 x 12 inches, and two pieces 14 x 9 inches. These are for the four sides of the box. Join them together with bookbinder's cloth or some light-tight material in the following order: 14 x 12, 14 x 9, 14 x 12, 14 x 9 inches. In joining, be careful to allow about $\frac{1}{8}$ inch between each piece of millboard; this will form a sort of hinge, and will allow the box to fold up flat when not in use.

For the top of the box it will be necessary to have a piece of thin tin which must have a hole cut out on which to fit a cowl so as to ventilate the box and carry off the heat when the gas is lighted inside. If the box is made to the measurements named, a piece of tin, 14 x 11 inches will be required. From each corner cut out a square inch and fold over, forming a rim 1 inch wide. The bottom of the box must be made of wood. As it will be necessary to have some support for the camera when placed in front of the box for enlarging, make this piece to measure about 20 x 9 inches.

Place the enlarging box on the board in position, and, in order to keep it in place, screw two pieces of wood on the two edges of the board to fasten the box firmly to when enlarging. A couple of screw nuts will secure in position (fig. 1), A. In front of the box a raised platform must be made to place the camera on. The height of this will depend on the size of the camera used, but will in all probability range from 2 to 3 inches. A piece of wood or millboard large enough to support the

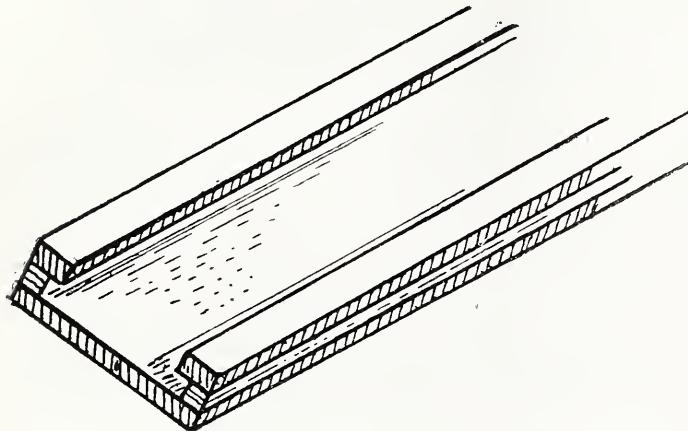


FIG. 3.

camera, and fastened on two pieces of wood the requisite height, will be found the simplest way of doing this (fig. 1), B.

Now cut a circular hole in the front of the box to carry the condenser (fig. 1), C. The position of this should be about 4 to 5 inches from the bottom, so that the centre of negative comes opposite centre of condenser. Now cut a piece out from the back of the box, about 8 x 6 inches. This is necessary for adjusting the light during enlarging, and can be covered over with a small curtain (fig. 1), D.

We shall also require the tray that carries the illuminant raised a little from the bottom. This can be done by making a raised platform, similar to the one in front that carries the camera (fig. 1), E. If two little strips of wood are fastened to the top of this platform to form a groove for the tray to move backwards and forwards, it will be found a great help in keeping the tray in position.

We will now turn our attention to the board on which to project the enlarged image (fig. 2), A. It is absolutely necessary that this should be perpendicular and at right angles to the negative. Get a block of wood, 5 inches wide by $\frac{1}{2}$ inch thick and 6 inches long (fig. 2), B. At one end of this place the board upon which we project the image, fastening it at right angles by two brackets. The size of this board will, of course, depend on the size of the enlargement required, but 15 x 12 inches will be found a convenient size. Be very careful that the brackets are at right angles, or it will throw part of the enlarged image out of focus. Previous to fastening, cut a strip about an inch wide from bottom of board at each end (see illustration).

We now have complete the box to contain the illuminant, and the board to receive the enlarged image. It is, however, necessary that this board should move in a straight line to and from the camera, or the image will be out of focus. To get over this difficulty take a piece of wood about 2 or 3 feet long and 6 inches in width. The length of this will vary with the focus of the lens being used, the longer the focus the longer the board. A 5-inch lens will require a board about the length named. Now cut two strips of wood $\frac{1}{2}$ inch square, and about 2 feet in length. Screw these on top of the piece of wood at the edges, so that, when the piece carrying the enlarging board is placed between them, it will slide smoothly up and down. Now get two more strips of $\frac{1}{2}$ -inch wood, this

time 1 inch wide by 2 feet long. Screw these on top of the pieces $\frac{1}{2}$ -inch square, and we shall have formed a groove in which the enlarging board will move to and fro (fig. 3). If this board is too long, saw it in half, and hinge the two parts together. It can then be folded over and packed away in a smaller space.

Our apparatus is now complete. To use, place the tray with the incandescent burner in the box at the back of the condenser, connect with rubber tubing to a gas-burner, and light up. Put the negative to be enlarged in the dark slide at back of camera, and draw both shutters, placing this on the raised platform with the negative next to the condenser. The grooved board should be placed right up to the board on which the camera stands. (These two boards may be fastened together with hinges if preferred, but it is not necessary. Be careful, however, in either case to cut off both ends where they join at right angles.) The distance between lens and negative, and lens and enlarging board, will, of course, depend on the size we intend the enlargement to be. This is, however, not a difficult matter, and can easily be ascertained. If any trouble is experienced, a glance at the tables of enlargements in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHIC ALMANAC will make it all clear.

J. H. BURKE.

THE PURIFICATION OF ACETYLENE GAS.

A GREAT deal is being said, written, and printed concerning the purification of acetylene.

Every user of the gas is aware of the fact that purification is a necessity if the use of it is to be a comfort, and not a nuisance, from the sanitary inspector's point of view.

When the present writer commenced to use this beautiful illuminant, he was informed that purification was hardly necessary, considering the short time the gas is required in taking a sitter. This was found to be a fallacy, as, with some carbide, the studio soon filled with a thick, smoky haze, which attacked the lungs of both sitter and operator to an extent sufficient to set them coughing, and to render it impossible to obtain another negative until the place had been thoroughly ventilated.

This being thus, he set about him to discover a means of preventing the appearance of these annoying fumes. It was found that they were caused by impurities arising in the generation of the gas, the said impurities being sulphuretted and phosphoretted hydrogen, and also ammonia. Of the latter very little remained, as the gas, after leaving the generating chambers, had to bubble through some forty gallons of water, which practically removed that impurity. There remained for consideration the sulphuretted and phosphoretted hydrogen only.

After making various experiments and seeking further information, it was decided to make a purifier on the plan recommended by G. F. Thompson in his book on *Acetylene Gas and Calcium Carbide*,* in which he states, in the closing chapter on purifying and drying, that, "under ordinary conditions, the gas will be thoroughly purified by being passed through material saturated with sulphuric or hydrochloric acid, and afterwards drying by passing the gas through calcium chloride."

For the information of the readers of this JOURNAL, a description of a purifier constructed merely to test the utility of the method advised, and found to be so efficacious that it has remained in use during the last three months, and is now working satisfactorily, is here given.

It was constructed from odd material at hand, and any one handy with the soldering iron can make one at a cost of not more than five or six shillings, and the cost of recharging whenever it may be necessary would not be more than a few pence.

The materials required are a 28-pound carbide can, measuring 16 inches in height and 8 inches in diameter, a 7-inch flower-pot and saucer, enough coke broken up to about the size of walnuts and free from dust to fill the flower-pot, a few feet of compo pipe, three $\frac{1}{2}$ inch brass unions, a small tap, a piece of perforated zinc about 6 inches square, a sixpenny box of glass wool from the chemist's, a tube of tin about 19 inches high and $3\frac{1}{2}$ inches in diameter, such as platinum paper is stored in, a small tin box 3 or 4 inches wide and about 1 inch thick—an old harness paste box will do—2 pounds of hydrochloric acid, and $1\frac{1}{2}$ pounds of calcium chloride.

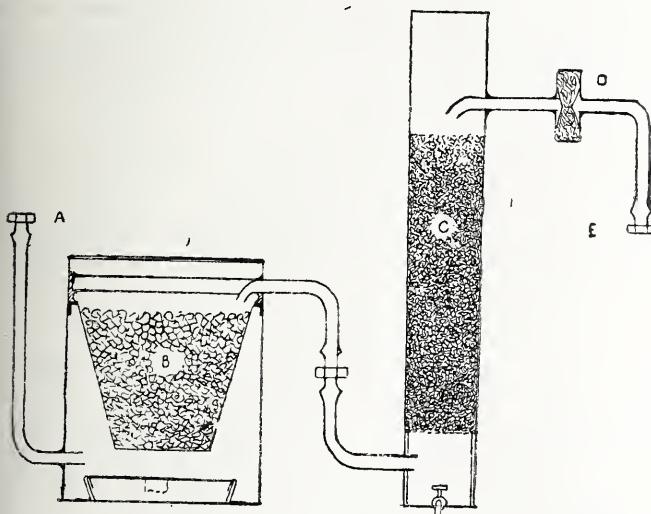
Proceed as follows: Cut the carbide can down to $10\frac{1}{2}$ inches in height, and pierce a hole about 3 inches from the bottom to take inlet pipe, and another, one inch from the top on the opposite side, for the insertion of the outlet; solder four pieces of tin in the bottom to hold the saucer in place—this is to catch any drip there may be from the flower-pot. Next make a tin collar, the outside to be large enough to just fit in the can, and the inside sufficiently large to take the flower-pot just under the rim. Solder this in the can so as to support the flower-pot at about 2 or 3 inches from the bottom, then take the flower-pot and drill 4 holes round the side at about 1 inch from the bottom—these are to break the gas into streams. Place the flower-pot in the can, the rim resting on the collar; fill in the space between the pot, and the side of the can with plaster of Paris, finishing off smooth all round, and, when dry, give it a coat of any enamel paint that may be handy; measure off sufficient pipe to reach outlet of generator from inlet of purifier when in position, and, inserting

* *Acetylene Gas and Calcium Carbide*, by G. F. Thompson, Consulting Engineer. Published by the author at Lombard Chambers, Brixton-street. Price, 3s. 6d.

one end of it, about 1 inch into the hole, made 3 inches from the bottom, solder in firmly, making a good joint; next, taking one foot of pipe and passing 2 inches into the top hole of can, solder it in the same manner as before, cut out a top to fit inside the can, and with the edge turned down $\frac{1}{2}$ inch all round.

Take an old marmalade jar and three parts fill it with hydrochloric acid—this had better be done out of doors, set the jar into an earthenware developing dish, put the coke, bit by bit, into the acid, dousing it under with a piece of stick, turning it out as it is saturated, and adding more acid as required until all is thoroughly soaked; allow it to drain a minute or two, and then transfer it to the flower-pot, filling it to within about one inch of the top; put in the top or lid, and, in order to make its removal easy for recharging, fill the interstices with plaster of Paris, as before. When dry, run solder right round, making it properly gas-tight, and your purifier is ready.

Now for the dehydrator: take the tin tube and punch a hole about 4 inches from the bottom, and on the opposite side a second about 3 inches from the top, to take inlet and outlet pipes, and a third as near the bottom as possible in the front, to take the small brass water-tap which is to allow of the removal of any moisture that may gather at the bottom. Next make a grid of perforated zinc, just small enough to drop down inside the tin, and supported on a tin sleeve or lining, so that the grid when in position is about an inch above the inlet hole. Solder on



A Inlet from Generator.
C Calcium Chloride.

B Coke saturated with Hydrochloric Acid.
D Outlet to Main Service pipe.

the tap, and insert the end of a piece of pipe about one foot long in the inlet hole, and a piece about three-inches in length in the top or outlet hole, soldering them both in place, take the harness paste box and punch a hole through lid and bottom in the centre, and barely insert the end of the short outlet pipe, solder it round inside; and over the end of the pipe, inside the box, solder a rather obtuse cone of perforated zinc, then take the top of the box and enough pipe to reach to your service main, putting a zinc cone over the end as before, fill the box loosely with glass wool; and, putting the lid on, solder round securely.

The object of the glass wool is to remove any bodily impurities there may be in the gas, and also it forms a strike-back trap. Should the flame from any cause do so, it would prevent the flame reaching the purifier and generator.

Fill the tube with the calcium chloride and solder on the cap or lid, joint your brass unions one between purifier and dryer, and the others between the generator and purifier and wool-box and main service pipe. Give the whole two coats of red enamel paint, and your task is finished.

When the time comes to recharge the purifier, disconnect it from generator and dryer, and run a hot soldering iron round the lid, take out the coke, wash it in a pail of water, resaturate and return it to the flower-pot, solder on the lid again, and recouple the unions. The cost is a mere trifle, and the benefit great. The accompanying sketch will help to clear any doubtful points in the description.

JESSE LANDON.

LONG-RANGE PHOTOGRAPHY.

MR. ERNEST MARRIAGE, who is so well known for his unique architectural studies, chanced on a singularly happy moment, as the President reminded the meeting, to deliver his lecture on "Tele-photography," which drew a large audience to the Croydon Camera Club lecture-room last week.

Mr. Maclean, in his further remarks while introducing the lecturer, drew attention to the great interest and discussion which had lately arisen as to the value of long-range photography for military reconnaissance,

and described a number of such photographs taken by Mr. Shelley, special correspondent of *The King*, the negatives of which he had seen, and from which he judged that, by the aid of a lantern, they would give much valuable information. He also alluded to the admirable treatise on the subject by Mr. Dallmeyer, and handed round for inspection a copy of the work in question.

Mr. Marriage, who was received with much cordiality, began by explaining, with the aid of lantern slides, such special forms of apparatus as he found best to use. A strongly made long-extension (but not treble extension) camera, and a very firm tripod, were the main *desiderata*. As regards length of exposure, it compares with that required for the ordinary image directly as the square of the linear magnification. How to reckon this last was also clearly explained.

Following these technical data, a large and varied display of slides from Mr. Marriage's tele-photographic studies were shown. Thus, sets of three or more were displayed to illustrate the magnification of the image obtainable with various "negative" attachments. Others illustrated the difference of definition existing between (a) a tele-photograph of a distant village and (b) a view of the same village taken with an ordinary lens and having the part included by (a) enlarged to the same dimension. The view (a) was considered the best; (b), no doubt, suffered somewhat because of the magnification of the grain in the film, which would accompany considerable enlargement.

NATURALISTIC PERSPECTIVE.

The effect of the tele-photographic lens in rendering perspective was next dwelt upon, and, although under certain circumstances there is a considerable gain in employing the above lens, the feeling of the meeting was that the lens is apt to err in a direction exactly opposite that in which the W. A. lens is at fault. A notable example of this faultiness was shown in a cow taken from the rear with its head turned round, so that the latter was seen in profile. In this case the diminishment in size which the eye is accustomed to see in subjects which recede from the picture plane, was not exhibited, and hence the cow's head, although forming that part of the animal furthest away from the lens, seemed to be about one and a half times as large as it should be.

Many other points and uses of this useful lens were illustrated with a number of striking, and, in many cases, charming lantern slides, several of which had been obtained with *The Naturalist's Hand Camera*. Special note may be made of a figure study, and of some botanical pictures exhibiting minute flowers, &c., in their native habitats. Mr. Marriage concluded his lecture with a brilliant series of pictures, illustrating architectural details of quaint and exquisite carvings, mainly of capitals in high positions, which few eyes can see *in situ*, and which the ordinary lens cannot do justice to.

At the close of a lecture listened to with marked attention, a considerable amount of discussion was held, and many questions asked, those taking a principal part in this being Messrs. Maclean (who explained that, when photographing objects over a mile away, the ordinary estimated exposure needful might be reduced to one-third), Rogers, Edwards (who observed that after this lecture he decided to answer the question, "Is Marriage a failure?" with a "No!"), Isaac (who as usual worked the lantern with much skill), Jeffrey, Jewell (who remarked upon the difficulties attending long-distance photography in hot climates, stating he had often seen at Melbourne racetrack the horizontal top of a long wooden enclosure, at a distance of about a quarter of a mile, represented by a dancing serpentine line), Wratten (who spoke of his experiences with tele-photography in 1897), and Salt.

At the instance of the President, a strongly emphasised vote of thanks was adopted by acclamation, accompanied by sustained applause.

RECENT ADVANCES IN RADIOPHOTOGRAPHY.

THE war seems to have, for the present, knocked the interest out of all other subjects, and such engrossing matters as those which advanced photography continually brings forward have to take a back seat. Even at the Camera Club, the last new developer and the most recent isochromatic screen are forgotten, and the members crowd round the fireplace at the end of the big room, where the latest telegrams from the seat of war or the fairy tales from Dr. Leyds are posted every half-hour, or as soon as they come to hand.

It might, therefore, have been anticipated that a discourse on such a recondite subject as the Röntgen rays would have failed to attract a sufficient audience, and that Mr. William Webster would have found in front of him a beggarly array of empty benches; but, happily, this was not the case, and by eight o'clock the members mustered in goodly numbers. There were many visitors, chiefly of the medical persuasion, also present, and these gentlemen took upon themselves the chief

burden of the interesting discussion which followed the reading of the paper.

Mr. Webster commenced with that awkward thing known as an apology. He lived at Blackheath, and the Blackheathens are much belated in the matter of electric lighting. Owing to the fogs, and to the somewhat slow travelling due to the South-Eastern Railway, Blackheath does not get its news very quickly, and therefore it was a long time before it dawned upon these dwellers in Kent that electric lighting was possible. After some years, wires were laid down, but the current which is to flow along those conductors is not yet ready, and therefore the beautiful experiments with the spectrum which Mr. Webster had intended to show to the Club could not be rehearsed, and could not be performed. An experimental lecture without experiments is a futile thing, and the lecturer therefore uttered maledictions upon the Blackheathen absence of electric current, revenged himself by boycotting everybody concerned, and made up his mind to trust to lantern slides alone for his illustrations.

Mr. Webster confined the first portion of his lecture to the consideration of various curiosities in the anatomy of the skeleton of the hand as revealed by radiography. Some years ago he showed several of his pictures to eminent surgeons, and it was acknowledged by them that this new method of showing the bony structure of the living hand must lead to serious modifications of the views held by anatomists as expressed in the text-books. These differences were associated more particularly with the gradual ossification of the structures, which is not complete in the human hand until the adult stage is reached.

Mr. Webster's radiographs, or skiographs, which were projected upon the lantern screen showed the gradual process of ossification very beautifully, from the infant hand to that of the adult. In the new-born child the bones are in quite a rudimentary condition, the carpal and metacarpal bones looking like so many ill-formed and detached pieces of limy matter. At two years of age the shape of these bones becomes more pronounced, and the little button-like outgrowths (epiphyses) begin to make their appearance between the shaft bones (phalanges) of the fingers. At four and a half years the buttons are much larger and distinct, and the carpal, or wrist, bones become far more accentuated. At seven years all the bones of the hand can be readily recognised, although their shape is as yet imperfect. The hand may be said to reach its perfect condition, so far as youth is concerned, at about the twelfth year, but we shall presently see that variations come in through external conditions. The button-like epiphyses are still prominent between the phalanges, but in the next few years they gradually join the shank bones until the adult hand is fully formed.

Radiography has taught our anatomists one thing at least that they never knew before, and that is the curious circumstance that the ossification process is hastened by hard work. One of Mr. Webster's photographs showed the hand of a boy of fifteen which was as fully developed as if he had been six years older; he was the son of a blacksmith. But the credit of the first observation of this kind is due to Mr. T. C. Hepworth who, four years ago, recognising that such an effect might be anticipated, radiographed the hand of Master Basil Gauntlett at the age of ten years, and proved that the three hours' daily practice at the piano had caused the same hastening of nature's handiwork. Mr. Hepworth was present at the lecture and called attention to this early observation of his.

Mr. Webster showed a photograph of the first Jackson's X-ray tube, and he rightly pointed out that this was a modification of Crookes' tube. Some of us are apt to forget that, without the early labours of Crookes, Röntgen's X rays would probably have remained undiscovered for a long time to come. With this same tube Mr. Jackson, of King's College, London, had seen the bones of his hand on a screen some time before Röntgen had astonished the world with the same observation. Mr. Webster had also a good word to say of the Apps induction coil. Apps was one of the first makers of these coils, and it is pleasant to know that his efforts have not been superseded by late comers.

Mr. Webster next approached the very interesting subject of the effect of the X rays upon the skin. It would seem that fond parents are very loth to allow their children to place their hands, or other parts of their anatomy, under the influence of these rays, and small blame to them, for reports of the dire injuries resulting from such influence have been rife ever since Röntgen made his first experiments. The lecturer himself had suffered from a kind of X-ray sunburn, and the mischief culminated in the loss of two of his finger-nails; but it is certain that these effects only come about when the skin has been subjected to the action of the rays time after time at frequent intervals. A single sitting, even though it may extend to a quarter of an hour or more, has no perceptible effect upon the epidermis. On the other hand, these mysterious radiations would seem to have a decidedly beneficial action under certain conditions. The superficial tanning of the skin which is brought about renders the surface immune to the bite of such insects as gnats and mosquitoes. A sun-tanned skin is, in like manner, proof against insect attack, and there is reason to believe that the radiant heat from prolonged exposure to the electric arc light confers a similar immunity upon the skin.

It has long been thought that the X rays may be found of therapeutic value in the cure of certain skin diseases, and Mr. Webster brought forward a case which seems to corroborate this view, although count may

not have been taken of diet and other hygienic conditions which prevailed at the time of treatment. It was a case of lupus. First we were shown a photograph of the patient as he was before treatment, with the horrible fungoid growth upon his nose. After some weeks' daily application of the X rays, the patient wearing a mask which protected every part of his face but the diseased organ during the application of the rays, he was, to all intents and purposes, cured. His later state was shown not only by a photograph, but, in still more convincing manner, by the patient himself, who was "on view" during the lecture. The consideration of this interesting case brought Mr. Webster's lecture to a conclusion.

Dr. Abrahams, who occupied the chair, in commenting upon the lecturer's remarks and illustrations, said that abroad, especially at Copenhagen, a number of lupus cases had been treated by exposure to sunlight, and about thirty per cent. of cures had been reported. He had some doubt whether such cures could be regarded as permanent, a thing which time alone could show. There was no doubt that radiography was of enormous service in the study of anatomy, and they all would have to correct the impressions gained from books.

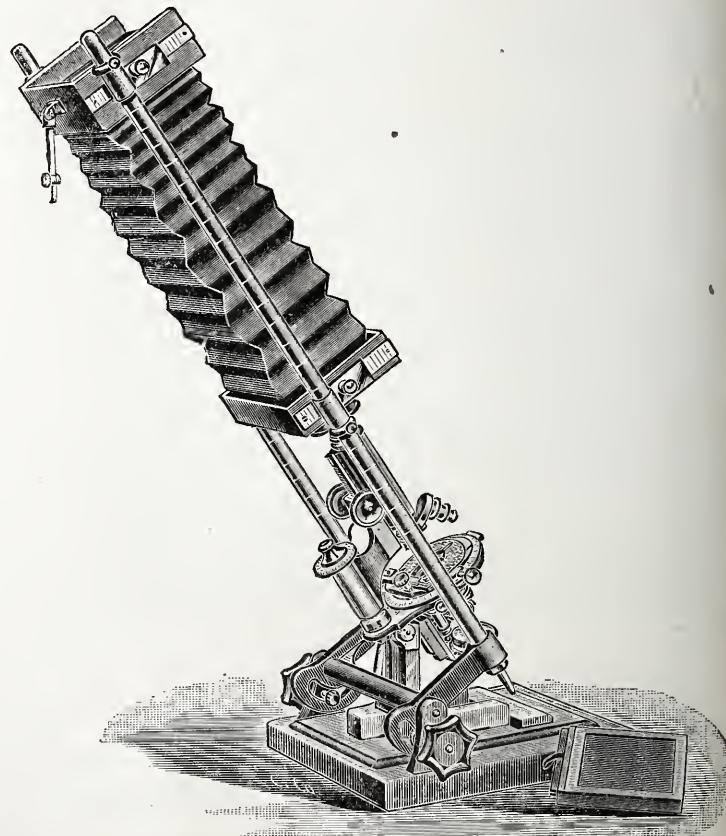
The President of the Röntgen Society said that there is no doubt that the text-books put the ossification of the centres very much too late. He was of opinion that Mr. Webster was wrong in depending so much upon what he might call the snap-shot principle in making his radiographic exposures. As a rule, an extended time could be given to the work with advantage. He also thought that Mr. Webster in his lupus case had used a needlessly powerful current, the same effects being gained in a case which had come under his own notice with a much weaker force. He questioned, too, whether the indiarubber mask described by the lecturer was a real protection to the other parts of the skin. He himself always used a mask of lead, which was quite impenetrable by the rays.

After Mr. Webster had dealt in a brief manner with the several points raised in the discussion, he showed a new form of reflecting lantern or aphengescope, which had been recently introduced by Messrs. Newton for throwing drawings and solid objects on a screen. The lantern body was of the old pattern, and it contained two incandescent (gas) burners, each furnished with a reflector. The projecting lens was a single one of about four inches diameter.

THE BAUSCH AND LOMB PHOTO-MICROGRAPHIC OUTFIT.

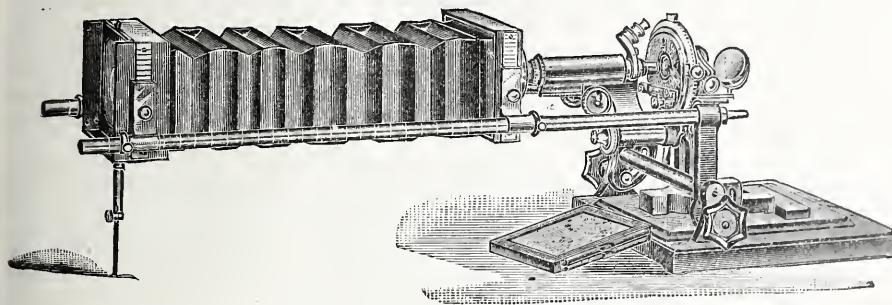
Agents: A. E. Staley & Co., 35, Aldermanbury, E.C.

AMONGST the many specialities of the renowned American house of Bausch & Lomb, for which Messrs. Staley are agents, may be mentioned the admirable photo-micrographic system shown in the illus-



trations. The camera, which takes either quarter-plate or 5 x 4, has all the usual motions; the bellows gives an extension of twenty inches. The stand is solid, enamelled, with nickelled fittings; there are double clamping

screws for vertical or horizontal positions; adjustable supporting arm for camera, and double dark slide. The light-tight metal connexions between microscope and camera are blackened inside and out. The microscope supplied is Messrs. Bausch & Lomb's newest model, with two eyepieces, and one-inch, two-thirds, and one-sixth objectives; sub-stage, with iris diaphragm and ray filter; triple nose piece; con-



densing lens, on stand; and Welsbach gas lamp, with metal chimney and iris diaphragm. The entire system is beautifully finished throughout, and we have much pleasure in bringing it to the notice of our readers, who will gain a clear idea of its external appearance from the illustrations.

COMMERCIAL SAMPLES OF CALCIUM CARBIDE.

The following is a translation from the *Annales de Chimie et de Physique* of a paper by M. Henri Moissan, the discoverer of electrical carbide:—

Although it may appear an extremely simple thing, yet the manufacture of calcium carbide in large quantities presents not a few difficulties. The precautions to be observed in the preparation of the mixture, the choice of suitable lime and carbon, the heat of the furnace, the arrangement of the large electrodes between which the current passes, have been in turn considered, and at the present time the best conditions are pretty clearly understood. The withdrawal of the large volumes of incandescent gas produced is still a difficulty, but one which, according to the most recent technological experiments, is on a fair way to solution.

At the outset of this industry, the materials used—the lime and carbon—left much to be desired. The earliest manufacturers of carbide used, as a source of carbon, coke containing much mineral matter as well as sulphur and phosphorus. The lime, too, was anything but pure, containing almost always silicate of aluminium and phosphates and sulphates. It is not surprising, therefore, that such a mixture, after ignition in the electric furnace, should have furnished a most impure carbide. It contained phosphide of calcium, sulphide of aluminium, and silicides, decomposable even by water. In the presence of a small quantity of water, this compound produced an extremely impure acetylene, containing phosphoretted hydrogen and sulphuretted hydrogen.

In order to increase their profits, or perhaps through ignorance, these firms produced a very impure carbide, and therefore a very impure acetylene. This low-grade product was the cause of the early difficulties in the application of acetylene to lighting, but it was soon understood that a pure lime and carbon, as free as possible from all mineral matter, must be used, and at the present time the manufacture is done under much better conditions. Carbides are now obtainable in commerce which have been thoroughly fused, are homogeneous, and exhibit the sharply crystalline fracture, with reddish-brown reflections, characteristic of the pure product.

It is to carbide answering this description that the acetylene manufacturer must give the preference. Although its appearance is so characteristic, the analysis of carbide is advisable. Many methods have already been given, and that of MM. Lunge and Cedercroft, in which they let fall a certain weight of carbide into water, appears to me to give good results. The great difficulty is to secure an average sample, the hardness of the material making this very difficult. Theoretically, one kilo of carbide gives 349 litres of acetylene (*i.e.*, one pound gives 5.6 cubic feet).—Translator).

In decomposing samples of carbide with milk of lime, saturated with acetylene, we obtained the following results, expressed at 0° C. and 760 mm. (= 32° F. and thirty inches).

	1.	2.	3.	4.	5.	6.	7.
Vol. (a)	292.81	294.10	301.30	304.61	307.72	316.41	318.77
(b)	4.70	4.72	4.87	4.88	4.94	5.08	5.12

a gives litres per kilo; b gives cubic feet per pound. If, on the other hand, the carbide is not the fused and crystallised variety, if it is porous and greyish, the yield is always less. With such samples we obtained the following figures:—

	1.	2.	3.
Vol. (a) ...	228.6	250.4	260.3
(b) ...	3.67	4.02	4.18

Without dwelling further on the impurities in acetylene gas, we will pass to consider the form in which the impurities exist in the carbide. We may, however, point out a fact already mentioned by M. Chuard, that acetylene contains ammonia. He found the percentage in the gas to vary from .03 to .06, and the nitrogen in the residue from .24 per cent. to .40 per cent. In four samples which we analysed we found total N.:—.02, .12, .15, and .31 per cent. Several of these carbides gave a small quantity of hydrogen phosphide, whilst others were free from it; but we have studied in particular the composition of the insoluble residue which the carbide leaves when decomposed by water.

In order to obtain this residue we decomposed the carbide with a solution of sugar in water, in this way keeping the lime in solution as saccharate. The small residue thus remaining (we used ten grammes of sample) was thrown on to a filter, washed first with sugar solution, and then with pure water, both liquids being free from carbon dioxide. It was then treated with alcohol and ether, and dried in *vacuo* at 40° C.

Examined under a microscope, this residue shows calcium sulphide, calcium and iron silicates, and white particles rich in lime and sometimes a little sulphide of calcium and graphite. It loses weight slightly in hydrochloric acid (1 in 10), iron, lime, and alumina passing into solution. Silicide of carbon and graphite remain unaltered, whilst calcium sulphide disappears. By treating with hydrochloric acid (concentrated), a certain proportion of lime, iron, and silicon passes into solution, but there is no relation between the insoluble matter and the yield of acetylene. The following are the results obtained by treating the samples as above described:—

	Per Cent. of Residue.				
	1.	2.	3.	4.	5.
Sugar solution	3.4	5.3	3.9	3.9	3.4
Hydrochloric acid (1 in 10)	2.1	1.9	2.4	2.4	1.4
Hydrochloric acid (concentrated)	1.7	1.7	2.2	2.2	1.1

By a use of this method, coupled with an examination of the residues under the microscope, we have gained much information as to the form in which the impurities exist.

Silicon.—This is present mainly as silicide of carbon. This compound is easily recognised under the microscope, its hexagonal crystals, green or blue, being extremely characteristic. Owing to its great density (3.12) and its equally great stability, it can be easily separated from other substances. If the carbide residue be treated alternately with boiling sulphuric acid and hydrofluoric acid, only graphite and carbon silicide are left, and the latter can be readily separated by means of bromoform (sp. gr. 2.9). Silicon sometimes occurs, as Le Chatelier has shown, as calcium silicide, tiny globules, showing a metallic fracture and consisting of iron, carbon, and silicon, being sometimes observable. Crystals of silicon, as described by Marsden, are also to be found. We have never come across any samples of carbide which, when treated with a small quantity of water, exhibited the spontaneous inflammability of hydrogen silicide, but it has often occurred that this gas was evolved when the calcium silicide in the insoluble residue was treated with strong hydrochloric acid.

Sulphur.—In the samples which we have examined the sulphur was present as calcium sulphide or aluminium sulphide. We detected the presence of calcium sulphide in some of the residues from treatment with sugar solution by means of a solution of lead acetate, solution acidified with acetic acid. Under the microscope the white particles of calcium sulphide became completely black. Calcium sulphide does not evolve hydrogen sulphide by the action of water in the presence of hydrated lime. This we proved by finely powdering a small quantity of calcium sulphide prepared in the electric arc, agitating with milk of lime and testing the filtered liquid with a lead salt. No black precipitate was produced. It is to be noted that all the carbides which we have examined give, with excess of water, a milk of lime, the clear solution from which gives a black precipitate with salts of lead containing sulphur and traces of phosphorus, a result due to the decomposition of the calcium sulphide in the presence of the milk of lime. Hydrogen sulphide does not, however, occur in acetylene when the carbide is decomposed in a plentiful supply of water, the lime produced tending to retain the gas.

In the preparation of carbide the sulphates contained in the lime are reduced, forming calcium sulphide, which is not decomposed by water. If, however, the lime contains aluminium silicate, silicate of carbon is formed, and, if there is sulphur, as sulphate or sulphide, sulphide of aluminium, decomposable by cold water with evolution of hydrogen sulphide.

M. Mourlot, by heating sulphide of antimony and aluminium in the electric furnace, has indeed obtained a fused sulphide of aluminium of crystalline fracture and perfectly stable at the high temperature. Carbide prepared under these conditions can therefore contain aluminium sulphide, and will give rise, in presence of cold water, to the evolution of

hydrogen sulphide. The sulphur cannot exist in the state of silicon sulphide, as we proved by heating to redness impure aluminium containing silicon in a tube in a current of hydrogen sulphide. The Al_2S_3 melted and a ring of sulphide of silicon sublimed into the tube. Hence it could not occur in "electrical" carbide.

When a carbide contains a certain quantity of calcium sulphide, it gives, on decomposition with water, traces of an organic compound containing sulphur, and differing from hydrogen sulphide. This can be shown as follows.—

The acetylene produced by acting on the carbide with excess of water is passed through potash bulbs containing a solution of copper nitrate, or potash, or lead acetate. It is then burnt, and the products of combustion led into an aspirator and agitated with a little water, kept at 0°C . In three experiments made thus, a small quantity of sulphuric acid was detected. The potash bulbs had retained the hydrogen sulphide, and had allowed a sulphided compound to pass over. An experiment made in the same way, but aspirating the air of the laboratory, gave no sulphate. In this experiment the first Liebig tube containing copper nitrate or lead salt blackened under the action of hydrogen phosphide, but contained after the experiment only traces of sulphur, and often none at all. The gas was therefore perfectly freed from hydrogen sulphide.

The weight of the total sulphur in the carbide gave us a percentage of sulphur in the three samples: .37, .43, .74.

Iron is in the state of silicide or carbo-silicide. Its percentage is very variable, and depends almost entirely on the purity of the carbon used.

Phosphorus is the most difficult impurity to deal with. The greater part exists as calcium phosphide, which is decomposable by water, but it exists also as tiny globules, metallic in appearance, and containing iron and silicon.

Carbon.—Some samples of carbide contain notable quantities of graphite. The graphite which we isolated was in thin scales, sometimes hexagonal, but most frequently of round, irregular shape. It exists in only small quantity, and retains silicon and calcium with great tenacity.

Lastly, as the existence of diamonds in commercial samples of carbide has been asserted, we made special experiments upon this point.

After treatment with water, followed by hydrochloric acid, the residue was subjected to the process, which we have already described, for the separation of diamonds in presence of all kinds of other substances. We isolated some transparent particles, round in form, and with no apparent crystalline structure. They were incombustible in oxygen in the platinum boat described in our memoir on artificial diamonds.* None of the samples contained diamonds.

THE "BIOKAM."

At the meeting of the London and Provincial Photographic Association, on January 25, Mr. Walter D. Welford showed and described the Biokam apparatus for animated photography. It is remarkable for its small and compact appearance. The film is twenty-five feet in length, giving 700 exposures. Used as an ordinary hand camera, the same number of single views can be secured. The films are contained in drums, which are attachable to the apparatus as required. The exposed films may be rewound into the drums if desired, enabling any number of films to be exposed without recourse to a dark room. The film is pierced with one slit-like perforation in its centre between each exposure. After exposure the film is wound upon a frame studded with upright pegs, of a size capable of accommodating twenty-five feet of film. Twenty ounces of developer is named as enough solution, but sixty ounces is nearer the mark. The dish supplied was also, Mr. Welford considered, too shallow. Printing is done by passing through the apparatus the negative and an unexposed film in contact, and developing as before. The camera is then quickly turned into a projecting apparatus. There are two lenses—one for taking and one for the projection of the pictures—both of very short focus. Used with the incandescent gas light, for which the apparatus is intended, there is every safety, but, of course, only a small picture is given.

Mr. Welford subsequently showed on the screen a number of pictures, including four by himself taken in Belgium, and others of street scenes—conjuring, &c.—supplied by the Company.

SPECTROSCOPES AND GRATINGS FOR COLOUR PHOTOGRAPHY.

In a recent number of *Nature* Mr. C. P. Butler, of the Royal College of Science, draws attention to the fact that Mr. T. Thorp, of Manchester, who has so successfully reproduced copies of Rowland's gratings, has been able to make an "echelon" grating on the principle suggested by Professor A. A. Michelson last year, but stated to be well nigh impossible on account of mechanical difficulties. The success of the operations,

adds Mr. Butler, depends on the shape, depth, and spacing of the grooves, and after many calculations and preliminary trials Mr. Thorp finds he can produce echelon films throwing the *whole* of the light into the first, second, or other requisite order, the direct image being practically suppressed.

In order to show us the perfection to which his films have attained, Mr. Thorp has forwarded us a small spectroscope with fixed slit, selling at 10s., a small grating selling at 10s., and a large grating (mounted films) which he purposed disposing of cheaply to purchasers of his spectrosopes for experiments in colour photography diffraction methods, the method being quite distinct from that of Professor Wood, to whom, however, adds Mr. Thorp, we are all indebted for the inception of the process.

Professor Wood, Mr. Thorp points out, cannot use rulings of more than about 3000 or 4000 to the inch, whilst by Mr. Thorp's method lines of *any* closeness can be successfully used. He has *only* one ruling, yet he is enabled to show diffraction pictures in most brilliant colours, natural or otherwise, and has already exhibited the spectroscopic apparatus, which he has made for experimental purposes only, before several societies in the North of England. Mr. Thorp has been working at the process for some twelve months, and believes he sees his way to a very simple and efficient form of apparatus for exhibiting the pictures, as well as a simple means of reproduction. The latter process is *un fait accompli*, but, as the principal point in connexion with the idea is the subject of a patent, he cannot for the moment go further into the matter. He is at present investigating a new form of ruling, which promises to be quite an advance, as its spectrum is almost as brilliant as a prism one, nearly all the light being thrown into one order.

We have found the little spectroscope Mr. Thorp has kindly sent us of the greatest use. It is well worth the 10s. charged for it. All those of our readers who are interested in the allied subjects of spectroscopy and colour photography, should procure Mr. Thorp's list from him at Whitefield, near Manchester. It refers in detail to his transmission diffraction gratings, prism gratings, spectrosopes, dynamometers, polarising solar eyepieces, and other instruments.

PHOTOGRAPHIC CLUB'S ANNUAL LANTERN ENTERTAINMENT.

The Annual Lantern and Musical Entertainment and Ladies' Night took place on Wednesday, January 24, at Anderton's Hotel, Mr. H. Snowden Ward in the chair. The entertainment was under the capable direction of Mr. E. A. Newell, who had provided an excellent programme, which was admirably carried out by Mr. Fred. W. Stephens, Mr. R. B. Hopkins, Miss Annie Swinfen, Mr. Chas. Volcard, Mr. Ager Grover, Mr. Musgrave Tufnail, and the other members of the Euterpean Quartette, with Mr. Thos. F. Noakes, accompanist. Lantern exhibitions were provided to vary the programme, slides being contributed by Mr. and Mrs. Welford, Mr. W. R. Stretton, Mr. Lewis Medland, Mrs. Catherine Weed Ward, Messrs. Chas. Reed, G. W. Tottem, J. R. Williams, and others. The entertainment was an unequalled success, credit for which must be given to the untiring efforts of Mr. Newell, seconded by the labours of the stewards.

REDHILL AND DISTRICT CAMERA CLUB'S LANTERN EVENING.

On January 24, the Club gave a most interesting lantern exhibition on a very large scale, at the Market Hall, Redhill, the subject being "Round about the Matterhorn and Aletsch Glacier." The lecture was given by Mr. Henry Speyer, a member of the Club. The Mayor of Reigate (Mr. F. E. Barnes, J.P.C.C.) took the chair, accompanied by the Mayoress. Mr. William Brooks (President of the Club) acted as lanternist, the lantern being in the gallery at the end of the hall, some seventy feet from the screen. The lecturer handled his subject in a very masterly manner; he has a very pleasing voice and a good style of delivery; his pictures show that his work (as an amateur) is of the highest possible order, and he knew his subject well, being an enthusiastic mountaineer. The lecture was interspersed by bits of dry humour. He took his audience from the Lake of Geneva in the lowlands, up to the highest peaks, and his cloud studies were perfect masterpieces of photographic art, and were loudly applauded by the audience; from start to finish the interest never flagged. The audience was one that any lecturer might be proud of, and was composed of the *élite* of Reigate and Redhill. A large number of reserved seats had been provided, which were soon filled and had to be largely increased. The lecture was in aid of the funds of the Club to purchase apparatus, &c. The services of both lecturer and lanternist were entirely free, and the whole was looked upon as a grand success.

After the lecture the Mayor proposed a vote of thanks to Mr. Speyer, the lecturer, and also to Mr. Brooks for acting as lanternist. The Club numbers nearly sixty members, and is still increasing. It is considered that an evening of this kind is the best thing to help a society on.

* *Le Four Electrique*, p. 174.

MONTHLY SUPPLEMENT

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[March 2, 1900.

THE LANTERN RECORD.

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LANTERN MEMS.

PHOTOGRAPHY in colours will always be a fascinating subject, and, though the discovery of the philosopher's stone in this respect is still in the dim distance, some advances have been made towards it during the past five years. Ives's name will always come to the top as one of the most earnest workers in the art of producing photographic representation in the colours of nature on the principles enunciated by the late Professor Clerk-Maxwell. The lecture by Professor R. W. Wood at the Society of Arts recently was full of interest, and the appreciative audience made up in enthusiasm for its comparative smallness in numbers. Previous lectures on this subject have taxed the resources of the attendants to find seating accommodation for those desirous of seeing the results of recent experimenters' work, and I quite thought I should have to be content with an odd corner in the lecture-room of the Society when I arrived just before eight o'clock.

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THE lecturer had his subject at his fingers' ends, and could tell us in a straightforward language what he knew himself about colour photography. He was not slow in giving credit to Mr. Ives and Dr. Joly for what they had done, and also to M. Lumière for his system of colour printing, but each of these was different in principle and method of working to the process he had developed, namely, the diffraction process. The results of this process, although very beautiful, could not claim to out-distance those mentioned, for it is not practical to project the result so that a large audience could see at once the beautiful colour subjects, as was done by Professor Lippmann, Mr. Ives, Dr. Joly, and others.

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THE essence of the success of the diffraction pictures lies in having the right number of lines to the screen to form the diffraction grating, and viewing the result from the exact point of view where the eye receives the rays representing the red, green, and blue-violet sensations in their proper positions. To obtain pure colours, lines from 2000 to 3000 to the inch have to be drawn. The former give red rays, while 2400 lines to the inch give green and 2750 blue. Pictures are taken of the same subject through screens of these different gradations of lines, and the film positives obtained from them put in superposition to make one transparency. In practice it was found that bichromated gelatine was too coarse in the grain to

give the best results, and so a solution of celluloid was poured on each of the positives, and, when dry, the very fine strip pulled off, and all three placed in contact above each other in exact register.

* * * * *

THE cost of ruling screens with such a number of lines is very great, and the risk of damage in using same is considerable, so it is interesting and satisfactory to know that excellent, if not equally good, results can be obtained from a photographic print from these refracted lines. In fact, a positive can be obtained from a positive, and so can be duplicated many times. The technical working of the process will be best understood by reading the article *in extenso* in the Society of Arts Journal, but it may be here interesting to state that the results shown justified all that was claimed for the examples.

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DIFFICULTIES of manipulation in working out the process occurred to Professor Wood, as is invariably the case with inventors, more particularly in getting screens ruled fine enough and of perfect regularity; but this seems to be surmounted now by screens ruled by Professor Rowland's engine at Baltimore. The examples shown in the library of the Society of Arts were most interesting and fascinating, the colours of the subjects being particularly brilliant. The device for seeing the transparencies stereoscopically was very ingenious. The two designs were each placed in front of a double convex magnifying glass, and at the focus of these lenses two horizontal slits in an opaque substance were made, and through this the positives were viewed. These slits were long enough to permit of persons of various interocular widths using them and in front of the slit two thin prisms are mounted to combine the two pictures, and so get stereoscopic effect. With all these pictures the light has to be in such a position that the rays fall at a certain angle on the design.

* * * * *

FROM the experiments made by Mr. Thomas Thorp of Manchester, it is possible to get diffraction gratings, or rather grooves of a saw-tooth section, of $\frac{1}{2000}$ of an inch in depth and $\frac{1}{1000}$ of an inch from ridge to ridge, and these, which are produced by a kind of steam-hammer process, are utilised by being copied in a celluloid casting, which then acts as a diffraction grating. The possibility of getting a suitable transparency for projection on the screen is now likely, for the work to this end depends on getting the light concentrated in one spectrum, and this much has been accomplished in verification of Lord Rayleigh's theory.

* * * * *

AN interesting subject has been thrashed out by Professor S. P. Langley, of Washington, U.S., viz., the percentage of light reflected from different surfaces, and taking black velvet as the most absorbent and a mirror as the least, and therefore highest reflective surface,

we have the percentages of reflected illuminant expressed as follows:—

Black.—Velvet, 0·4 p.c.; cloth, 1·2 p.c.; paper, 4·5 p.c.
Blue (dark), 6·5 p.c.; *Green (dark)*, 10·1 p.c.
Red (pale), 16·2 p.c.; *Yellow (dark)*, 20 p.c.
Blue (pale), 30 p.c.; *Yellow (pale)*, 40 p.c.
Green (pale), 46·5 p.c.; *Orange (pale)*, 54·8 p.c.
White (pale), 70 p.c.; *Mirror*, 92 p.c.

HENCE the purity of whiteness on lantern screens is a necessity to get the best results, and for certain special purposes and effects the silvered screens of Mr. Anderton's are beneficial; the table is also useful in connexion with photographic work, colours of walls, &c., it being stated that glossy or varnished paint is better than dull, and incandescent gaslight with a white varnish on the wall is the most economical illumination for a room.

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ONE of the leading weekly illustrated papers has "broken out in a new place," and now supplies lantern slides of the war pictures they publish at 1s. each, or hire them at 5s. a dozen. They also have a complete set with lecture that they hire out for 35s., and certain reductions for extension of time if more than one lecture is to be given. Dealers will be pleased to see there is no cutting of prices here, and the "penny per slide" scale, which can scarcely be worth while for a tradesman to bother with, does not apply in this case.

G. R. BAKER.

LECTURE SIGNALS.

THAT much of the success in limelight lecturing is attributable to a well and pre-arranged system of signalling between lecturer and operator is a fact well known to any one possessed of even a moderate amount of experience in limelight procedure. No doubt there are exceptions, in which signalling may be entirely dispensed with, such as where a lecturer has, by continuous practice with one and the same operator, made his subject and slides so familiar to the lanternist as will enable him to run through the entire lecture without requiring any change of signals from the platform; but with the general run of lecturers this will seldom be possible, and it is one of the greatest mistakes imaginable for any lecturer to attempt to discard the use of a signal of some kind or other when working with a strange operator. A glaring case of this kind recently came under the writer's notice. A gentleman prided himself that he had his lecture off by heart, having delivered it over a hundred times, and so modelled that any lanternist could, by merely paying attention to his words, know just when to make a change. Yet, notwithstanding the operator was a man of wide experience, the usual breakdowns, resulting in the recall of several slides, had to be made. This is just a case in point, and goes far to prove that, no matter how conversant a lecturer may be with his subject, it is impracticable to attempt delivery without adopting some method of signalling when a strange lanternist is operating.

Lantern signals, as a rule, may be divided into two classes, viz., those which appeal to the sense of vision, and those which are heard by the operator, and each of these methods can be carried into effect by a variety of means.

Speaking generally, the methods employed under the latter system embrace quite a number of devices whereby sounds are conveyed to the lanternists, such as the knock on the floor from the butt end of a pointer, and in the hands of some lecturers this proves a very effective method, for, when cleverly practised, the attention of an audience is seldom distracted from the subject, as is more or less the case when a noisy heel, or, what is even worse, a distracting "cric, cric," or castanet, is employed. How such a system of signalling ever became so much in use has puzzled many, for it has fatal drawbacks, as witness the exuberance of mischievous boys when they possess a signal of the same description as the lecturer. Another method that has, within recent years, become very popular, is an electric signal from the platform to the lantern, but of these there are good and very bad systems. It is by no means uncommon, where such is in use, for the signal to be so noisy as to make a fair resemblance to the whirring of a covey of partridges; whilst, on the other hand, it is possible to so arrange the system as to merely raise and lower a small arm, or semaphore, contained in a small box on the lantern stand. This is absolutely devoid of any noise, and is, all told,

far and away the best method yet devised for signalling a change of slides, its one and only drawback being that, except in fixed positions or halls where a wire can be permanently laid, some trouble is experienced in arranging to run a wire for one night's use in, at times, awkward situations. Several of our best lecturers in former years preferred to dispense with any special provision for signalling, and a favourite method with the versatile Andrew Pringle used to be the mere tapping with the blade of his penknife on a glass tumbler. There are, of course several other methods coming under the category of sound signals, which it is quite unnecessary to mention.

On the other hand, perhaps by far the better system is where a lecture so prearranges matters that his signal for a change of slide is only known to the lanternist, the audience being unable to detect the cue. This method has for many years been the one adopted by the writer, and it has invariably worked satisfactorily with every lanternist, be he stranger or familiar with the lecture that was being delivered. In silent signalling of this description, one of the easiest and surest signs to convey an intimation that a change of slide is desired will be found in merely raising the right hand and seizing or touching the right lapel of the coat. Any lecturer trying this simple dodge will be surprised at the ease and naturalness of the motion, which at times may be termed even graceful. It has also the advantage of keeping a lanternist's attention engaged upon the lecturer during his delivery, and this is the method the writer now invariably adopts; and he has never met with even a strange operator but who was favourably impressed with its effectiveness and simplicity. Some lecturers who likewise prefer a silent method of signalling make a practice of having ready at hand a sheet of ordinary writing-paper, and by merely turning the same, or slightly wafting it, thereby attracting the lanternist's attention. Others, again, make a rule of standing somewhat erect and placing the thumb of the right hand in their waistcoat pocket, or against their watch-chain buttonhole. Of the more mechanical methods of silent signalling by vision mention may be made of using a reading lamp having a red signal disc; but this may be said to be obsolete, except in cases where the entertainment takes more the nature of a lantern reading than a lecture. If a method of silent signalling be desired, there is no better sign than one or other of the two dodges previously mentioned; their great advantage lies in the fact that the right hand can be used to give the signal, no matter in what attitude the lecturer be at the desired moment, and it never attracts the attention of the audience from the subject.

Operators, as a rule, have a great deal to put up with at the hands of those lecturers who imagine they know more than any one else in limelight lecturing; and I often think there is no more conceited individual in the world than the half-fledged limelight lecturer, who knows far less than the man at the lamp, but who poses as one possessed of a deep knowledge of this class of entertainment. Over and over again have I witnessed fiascoes clearly attributable to the lecturer, or rather reader, himself, and which would never have occurred at the hands of an experienced speaker. It is safe to assume that any one who knows his part will never so recall a slide, or draw the audience's attention to any misplaced picture or mistake, for which he himself is invariably responsible, but which a greenhorn will take care to lay at the door of his operator. Such mistakes will occur with the best men; but they know better than to pay attention to such trivialities, and therefore go on with their lecture, and speak to the picture or subject on the screen. This is just one case in point where an inexperienced lecturer gives himself away before his audience, and at the same time acts unfairly by his operator. A ready speaker will at all times be able to turn such little mistakes into their proper groove in such a way as never to draw an audience's attention to them.

T. N. ARMSTRONG.

PHOTOGRAPHY AS AN AID TO SPECTRUM ANALYSIS.

In the current number of the *Photographisches Centralblatt*, Dr. E. Haschek gives an extremely interesting sketch of the above subject, which we abstract somewhat fully.

Newton had used prisms to prove that not only could light be refracted, but that it could also be dispersed, and, further, that the spectrum thus formed could be again combined into white light, and that the individual colours were no longer compound, but simple, and could not be further split up. He merely used a hole in a shutter through which the rays of light fell on to the prism. The renowned optician, Frauenhofer, was the first to improve on this simple arrangement by using a slit instead of a hole, and projected the image of this by means of a lens on to a prism and thus obtained a sharp spectrum.

When using the sun as the source of light, he noticed numerous dark lines crossing the spectrum, and further argued that they were independent of our atmosphere in that they were the same independently of the height of the sun. He then sketched the spectrum, and to the most prominent lines he assigned the letters of the alphabet, and they have always been called Fraunhofer's lines, and by these letters ever since. He further noticed that, when examining some artificial lights that one considered colourless showed a brilliant yellow line, which was coincident with the particular dark line in the solar spectrum, which he had called D. These dark lines were subsequently frequently noticed, and various explanations of their cause given, and many spectra of coloured flames were also examined.

This, then, was the position of the question when Kirchoff and Bunsen attacked it, and to them may be ascribed the foundation of spectrum analysis. Kirchoff enunciated the statement that a body absorbed those lines which it emitted at the same temperature, and that glowing solid and liquid bodies gave continuous spectra, but that gaseous substances give line or banded spectra. He further stated that any body brought into a gaseous state to incandescence gave a discontinuous spectrum peculiar to itself, by means of which it could be recognised. If, moreover, we had a mixture of luminous gases, each constituent would give its spectrum, and the composition of the gases could be determined.

These facts were applied by Kirchoff to the solar spectrum, and he argued that we have in the sun a solid or liquid body, the light of which was stopped by an atmosphere of vapour. The question which Kirchoff now attacked was, Are there present in the solar atmosphere the same substances as we have on earth, or are they others? This question could naturally only be examined by means of the elements, as their compounds must, at the temperature of the sun, be disassociated. In order to settle the question, he examined numerous terrestrial substances, and found their lines coincident with the solar lines. Thus hydrogen, sodium, iron, nickel, cobalt, magnesium, and many other substances were found in the sun.

Spectrum analysis does rather more than this, for, if we examine a terrestrial substance, we shall find numerous lines which may be ascribed to known elements, but there may be lines present of unknown origin, and they then prove the existence of a new element. Thus, in 1860, Kirchoff and Bunsen discovered the elements rubidium and caesium in certain water, and these lines were to be seen when only one drop of the liquid was placed in a gas-burner, but it was necessary to evaporate to less than 44,000 grammes of the liquid in order to obtain 16·5 grammes of the mixture of the chlorides of rubidium and caesium, which gave the characteristic lines. This is a striking proof of the sensitiveness of the new method and of its value to chemistry. In a similar way Crookes, in 1862, found thallium, in 1863 Reich and Richter found sodium, and in 1875 Lecoq de Boisbaudran gallium. The work of Kirchoff and Bunsen was continued by numerous investigators, and, amongst others, Huggins examined the spectra of the fixed stars, and proved that in these some of the earthly elements, and especially hydrogen, were present, and thus was proved the common chemical composition of the universe.

Kirchoff and Bunsen had drawn all their measurements of the lines to the empirical scale of the apparatus they used, and it was extremely difficult to reduce all the readings of other instruments to this. It was therefore extremely desirable to adopt some definite standard, and the wave-length was chosen. Fraunhofer had measured wave-lengths, but Angström was the first to make its use general, and after him is called the unit by which wave-lengths are measured, which is the ten-millionth of a millimetre, Angström's unit. He measured, by means of a grating, a series of standard lines, from which he reduced all others, and chose as the normal spectrum the grating spectrum, because in this the relative distribution of the colours is independent of the apparatus, and the distance of two lines is simply proportional to the difference of their wave-length. Unfortunately, the measure that he used was false, and it was necessary therefore to undertake a new estimation of the wave-lengths, and this was done by Thalén, and more recently, by Müller and Kempf. Here, however, was a great trouble, for, beyond errors of measurement was a variation in the standard lines used.

Now Rowland appears on the scene, and, rightly recognising that it was not of so much importance to know the absolute value of the wave-lengths as to know their exact relative numbers, he took the mean of the best known measurements of the wave-lengths of the sodium lines, and on this number based his system. If his numbers were once proved wrong, they could be put right by simple multiplication with a factor which was the same for all wave-lengths. With the aid of the values

of the wave-lengths for the sodium lines, Rowland estimated the wave-lengths of numerous lines of the solar and electric arc spectra, and these are the standard wave-lengths of all modern measurements. The apparatus he used, and which he had made, was the concave grating.

Possibly it would be as well to explain what the optician means by a grating. If we imagine grooves cut in a flat, transparent surface, so that equidistant transparent and opaque lines result, the incident rays of light will be bent by the opaque lines, and this in proportion to the wave-length; thus the light is again resolved into its coloured constituents, and with this, in opposition to the prism, the violet is dispersed the least and the red the most; thus there is formed not only one spectrum, but, symmetrically to the direct image which is caused by undispersed light, a whole series of spectra, which are called of the first, second, third, &c., order. There is thus a certain weakening of the light of the grating spectrum compared to that of the prismatic spectrum, and it is obvious that it is immaterial whether the grating be used in reflected or transmitted light; the case is the same, as there are accessories, such as mirrors or lenses, required to produce real images of the slit, which is what the spectrum lines actually are, therefore there is again a loss of light, and whole parts of the spectrum may be actually absorbed, as, for instance, the ultra-violet by glass. Rowland ruled the grating now direct on to a concave mirror of speculum metal, and thus made the concave grating, which, without any accessories of lenses or mirrors, formed real images of the spectral lines. By perfecting his machinery he has been able to rule 14,438, and latterly 20,000, lines to the inch.

With such a concave grating he has measured the standard wave-lengths and the Fraunhofer lines in the solar spectrum to the number of about 20,000, which are given to seven places of decimals. The accuracy of this is about 1000 of Angström's unit, or up to the 10,000 of a millionth of a millimetre, which, for a line in the violet with the wave-length of 4000 \AA , is accurate measurement up to 0·02 Angström with an error of 0·00005 per cent., an accuracy which has never been attained in any other measurements. To make this quite clear, it would mean that a distance of 40,000 kilometres would be accurately measured to within 50 centimetres, which is the exact measurement of the circumference of the earth on a meridian to half metre. Not only has Rowland accurately measured the wave-lengths, but also the intensity of the lines and their character, and compared them with the emission lines of nearly all known elements, so that we now know the composition of the solar atmosphere almost as well as though we had analysed it in the laboratory.

This work of Rowland was rendered possible not only by his excellent grating, but also by the employment of photography as an aid, particularly in the ultra-violet and for very faint lines, the measurement of which is extremely difficult. All the work since his, such as that by Kayser and Runge, as well as the work of Eder and Valenta, has been done by using photography.

All this work is done as follows: Two exposures are made on one plate, one of the substance to be examined, the other the standard spectrum, which is usually that of iron. It is best to make these exposures so that the two spectra partly overlap. Now, how are the measurements made? There are two methods, one of which we may call the subjective, the other the objective method. The first is measurement by means of a comparator. On a slit which passes along a ruled measure a microscope is fastened; the slit is, by the aid of a screw, moved along the spectrum; in the microscope the cross wires are focussed on the line, and the position read off on the measure. The position of the standard lines and that of the line to be measured is read off on the divisions of the comparator measure; the wave-lengths of the standard lines are known, also the difference of the wave-lengths in ratio to the distance of the lines, and inversely, assuming that the spectra have been taken with a grating, and the value of the wave-lengths can be reckoned from the numbers measured direct. But this work takes up an enormous amount of time, and Rowland has had a screw cut which moves his slit at one revolution two lines of the wave length difference of Angström's unit. This, however, does not do away with all reckoning, as the actual coincidence cannot be absolute.

The second method, the objective, is that which has been used by Professor Esner and Dr. Haschek, and it is simply a projection method. The spectra are projected on to a screen and enlarged, so that the lines which have the difference of the Angström's unit wave-length are exactly at 1 cm. from each other. For measuring, the standard lines are focussed on those parts of one of three millimetre scales affixed to the screen, which correspond to their wave-lengths and the wave-lengths of the strange lines can then be simply read off. The accuracy attainable with one measurement amounts to 0·02 \AA , thus about one-tenth of the

accuracy of Rowland's measurements, which it must not be forgotten are the mean of several readings, so that errors are reduced. By the objective, during the last five years, the lines of sixty elements have been determined in the Physico-chemical Institute of the Imperial University of Vienna. The total number of lines ascribed to individual elements amounts to about 50,000, the total number of those measured is at least double that. Already all the metals, even the rarest have been investigated, and only arsenic and the metalloids have now to be examined.

What, now, are the results that have so far been learnt from spectrum analysis? The merest superficial glance at the spectra teaches us that the number of lines varies from element to element. These numbers of lines, which have been determined for any element, are a periodic function of the atomic weight of the kind that, with increasing atomic weight of the elements, there are found at tolerably regular distances spectra very rich in lines and spectra very poor in lines. Those richest in lines are uranium, with 5270; tungsten, with about 3000; molybdenum, with 2800 lines in the ultra-violet region between the wave-lengths, 4700 to 2000A. These numbers apply to spark spectra. The number of lines of the arc spectra, which one can learn from the work of Rowland, Kayser, and Runge, & Hasselberg, are generally smaller; and only about two-thirds of the spark spectra follow the same law.

As a further result, we have learnt the difference between the arc and spark spectra. Even from the above it is clear that there are in the spark spectrum lines which are wanting in the arc spectrum, and not always the weak ones, and *vice versa*. Frequently the strong lines of one spectrum are weak in the other, or wanting altogether, so that their character may be entirely altered. It is obvious, therefore, that for examining substances by the aid of spectrum analysis it is always necessary to work in that method in which the elemental basis was made.

The alteration of the intensity of the spectrum lines is not, however, the worst thing to be contended with; much worse is their change of position. It was for a long time a moot point whether such could be the case, and this could not be settled with the incomplete prismatic apparatus. Rowland, again, settled this point. Michelson had suggested the wave-length of light as the unit of length, and tried to express the length of the metre in wave-lengths. The measurements made for this purpose showed differences to Rowland's—differences which could not be ascribed to errors in working—and the reason was that Michelson had used the spark, whilst Rowland had used the arc spectrum. Humphreys and Mohler examined the question, and they found that under pressure the wave-lengths were increased—that is, they were displaced towards the red. This displacement is proportional to the pressure and the wave-length of the line in question, and is, moreover, different for different elements.

Displacements of the lines also take place without pressure from causes inherent in the source of light itself, as in the fixed stars. It was pointed out by Doppler for sound waves, that, if we approach a wave centre with a certain velocity, we shall pass more waves in a certain unit of time than if we were in relative rest, or even if we were moving away. If the wave-centre approaches us, the same happens, and we get the tone of the sound, becoming gradually shriller; and, in the case of light, as the wave-centre approaches us, there will be a shortening of the wavelength, and *vice versa*; and from the amount of this displacement and the wavelength of the line we can estimate the rapidity of the procession or retrocession of the source of light, so that by spectrum analysis we learn not only the nature and composition of the fixed stars, but also their rapidity of movement in our line of sight.

DENSITY IN LANTERN SLIDES.

THE lantern-slide man has a tendency, most likely in his endeavour to get (using gelatine lantern plates) a satisfactory tone, or rather colour, to pile up the density of his slide. He is aware probably, from experience, that no very rich tones are to be had unless the initial deposit, from action and the developer, is fairly dense. This desire for colour is the reason, no doubt, why gelatine slides are so often unsatisfactory when subjected to the lantern test.

In comparing densities of slides by the various processes—gelatine, collodion, or carbon—it must not be forgotten that the gelatine film, be it ever so thin, will never equal collodion; also, that a "carbon" slide may have the appearance of being dense and yet be very transparent when viewed through the lantern. In the preface to my little book on *Lantern-slide Production*, Mr. J. P. Gibson cautions the worker against over-density. There is more in this than meets the eye. The slide

which looks extremely well as a transparency for decorative purposes will be far too dense for the lantern.

Lately, when making a set of slides for a lecture, I noticed this matter of density very particularly. The negatives themselves presented a respectable variety. There were negatives taken in the summer, bright and pleasing, and others of the "grey-day" order, and some wofull thin. Well, from the usual average negative I got the usual average slide, clean and of good colour; from the thin greyish negative I made the best possible positive, and that best was what one would expect from a short exposure, developed up strongly, the film then cleared, and the picture toned—in short, a slide clear and clean, but very far from dense. Then, again, there were a few slides from dense negatives, which displayed their origin, being strong, so far as concerns the principal objects the distances having been allowed to take their chance. The slides were handled by several men of average experience, and generally voted "far too thin." Now, this all depended on the way you looked at them. My way is to select the slides by means of the light afforded by an ordinary paraffin reading lamp, with opal shade, and it will be found that, if the detail, under such conditions, is all clearly visible, we may safely disregard mere detail, as such. As a matter of fact, the slides were, when shown in the lantern (oxyhydrogen), a very good lot, and those with the thinnest deposit were by no means the least satisfactory. I may remark here on the desirability of a perfectly clean screen. It is not such a difficult matter to get clean slides, and it is hard to have them shown, as they are sometimes, on a screen which exhibits all the marks of rough usage.

There is no doubt the thin slide, by the gelatine process, shows up the best on the screen, but I can imagine that the objection to a thin deposit will be mainly on the score of colour.

J. PIKE.

WHY LANTERN EXHIBITIONS ARE NOT MORE POPULAR.

BEING a somewhat old lantern amateur, I always read your Lantern Notes with much interest, and sometimes wish I could be present at the lantern evenings of the photographic societies, as, no doubt, some very fine slides are to be seen there; but the very indifferent quality of the usual commercial slide, such as I often exhibit for lecturers, schools, missionary meetings, &c., is, I think, a full answer to the often-repeated question why lantern exhibitions are not more patronised. Most of the slides that come into my hands are hired from the stocks of London houses, who make a business of letting slides on hire, and it is quite safe to say that seventy-five per cent. of such slides are rubbish. If of the old hand-drawn and painted order, they are most crude and rough, so that, when exhibited with a modern lime light and lenses, which really define, they are anything but pictures; and, if of the newer kind, produced by photography, the bulk of them are badly at fault from over or under-exposure or development; some are heavy and muddy, others thin and flat, and many of the sets from life models are most clumsy and ill-finished; as a rule, flesh is rendered dark and heavy, and colours of the draperies taken on the ordinary plates are rendered too dark and heavy also, and then, when the slides are attempted to be coloured, the effect is worse still. This is particularly noticeable in the slides of soldiers of the line, of which I have seen several lately. Perhaps worst of all are those slides which are bad photographs of the wash drawings from the illustrated papers, with no vigour or contrast about them, roughly coloured in some cases, in others simply poor, grey photographic transparencies, which are no pleasure to exhibit, and I should think are largely the cause of the lack of interest so much complained of. But given a good set of slides, with a good narrative and a good speaker to deliver it, I believe that now a lantern lecture is one of the surest means of drawing a good congregation. If I knew where to obtain a really fine set of slides illustrating the present war with a good interesting reading, I believe that good work might be done in this Weald of Kent towards the relief fund, but such slides as have passed through my lantern at present are not nearly good enough.

E. WILLIAMS.

Hawkhurst.

ACETYLENE—THE ORDER IN COUNCIL.

THE following is the text of the Order in Council prohibiting the admixture of air or oxygen gas:—

Whereas acetylene when in admixture with air or oxygen is specially dangerous to life or property by reason of its explosive properties. Now, therefore, be it ordered and declared as follows:

Acetylene, when in admixture with atmospheric air or with oxygen gas, in whatever proportion, and at whatever pressure, and whether or not in

admixture with other substances, shall be deemed to be an explosive within the meaning of the said Act.

And whereas it is in the judgment of Her Majesty expedient for the public safety that acetylene, when an explosive within the meaning of this order, shall be prohibited. Now, therefore, be it ordered and prescribed that acetylene declared to be an explosive by this order shall be prohibited from being manufactured, imported, kept, conveyed or sold.

Provided that nothing in this order shall apply to acetylene in admixture with air when such admixture takes place only in a burner or contrivance in which the mixture is intended to be burnt.

A CHAPTER FOR AMATEUR LANTERNISTS.

I TRUST that the following brief description of one or two articles, I find very useful in giving lantern exhibitions, may prove of service to some reader who may have a lantern but has not the requisite means whereby to purchase such articles on the market.

Moreover, there is always a certain amount of pleasure in making our own apparatus, and, if it is not always finished off in such a workmanlike manner as things we buy, still it often answers the purpose quite as well, if not better.

I have found it very necessary, in giving an entertainment to children, to have the lantern fixed firmly, so that a chance kick from some troublesome youngster did not wreck the whole apparatus. The ordinary three-legged stands are rather expensive, and also not so firm as they might be, so I therefore set about making one that would stand rough usage without being too cumbersome. I will endeavour to give a short description of it, so that any reader, if he desires, can make one like it.

Get two pieces of wood, 20 inches long by 8 inches wide. One of these should be an inch, and the other $\frac{1}{2}$ -inch in thickness. Place the thin one on top, and fasten together with a couple of hinges at one end. Purchase a strong thumbscrew, about 6 inches long (fig. 1, A). Bore a hole

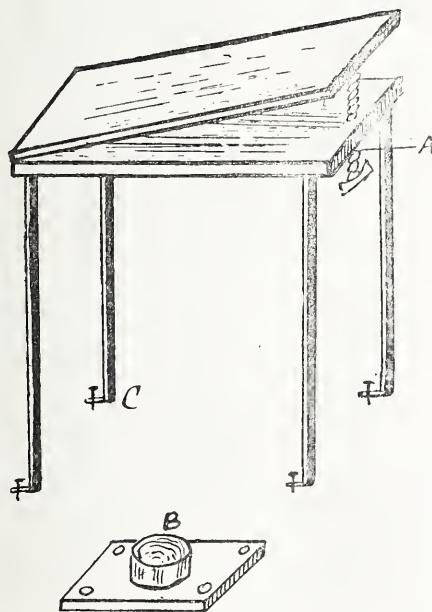


FIG. 1.

in the bottom piece of wood and sink in the worm of the screw. These two pieces of wood are to serve for a platform on which to screw the lantern, and by turning the screw underneath it will enable us to raise the lantern to any required height. The lantern can be kept in position by fastening with a small thumbscrew through the hole that is usually provided in the front of all lanterns, of course having previously sunk the worm of the screw in the exact position in the top piece of wood.

And now for the legs, the length of which will depend somewhat on the illuminant used in the lantern. If limelight is used, they can be made shorter, as the lantern can be tilted much more than if an oil lamp is used. I find also that the acetylene light will not allow so much tilting, as the flame is liable to damage the condenser if raised too much. A convenient height when limelight is used is about 4 feet 6 inches, but, if an oil lamp is used, about a foot longer. If the lantern box is made of wood, the legs may be still further shortened by fastening the box on to the lantern platform, and then screwing the lantern on to the box. By this method the length of the legs can be reduced about a foot.

The next thing is to get a gas-fitter to let you have four pieces of gas-piping, and at one end of each piece make them to screw into four sockets. On the end of each socket get him to braze an iron plate with four screw

holes (fig. 1, B). Screw these four sockets underneath the thick piece of wood forming the platform at the four corners. Have the other end of the gas-piping flattened out, and about $1\frac{1}{2}$ inches turned out to form a sort of foot to stand on. In these pieces have a small hole bored large enough to take a small screw or bradawl (fig 1, C). Our stand is now complete. To erect, screw the four legs into the sockets on the lantern platform, and either screw or fasten with small bradawls the other ends into the floor. Fasten the lantern on to the platform with the small thumbscrew, and the apparatus will be found quite firm and stable, and can be left without coming to grief. The expense of all this will be found very small, the gas-piping and work only costing a few shillings.

Another very necessary requirement is the possession of a good screen. Of course, if the lanternist travels about, he is compelled to have one that will fold up, and the best substance for this is good white linen. The brilliancy of the picture is, however, much increased by using an opaque screen. These are rather expensive to buy, and are also rather cumbersome to carry about, and, unless the exhibitions are given in the same hall, I should hardly like to recommend the purchase of one. Should, however, the reader be in the habit of using the same place for his entertainments, it will be worth the trouble of making one. They are usually made of linen, faced with white cartridge paper (fig. 2, A). Unless the screen is to be only a few feet square, it is not advisable to attempt to paste the paper on to the linen, but buy it already done. I purchased mine at a wholesale map-mounters. It is apparent to all that this cannot be folded up, so it is necessary to mount it on a roller the requisite length. At the other end a good stout lath will be necessary. If it is intended to hang the screen up from the walls or rafters of the hall, nothing further will be required, but very often this cannot be managed. It is then absolutely necessary to make some sort of stand to erect the screen on. There are

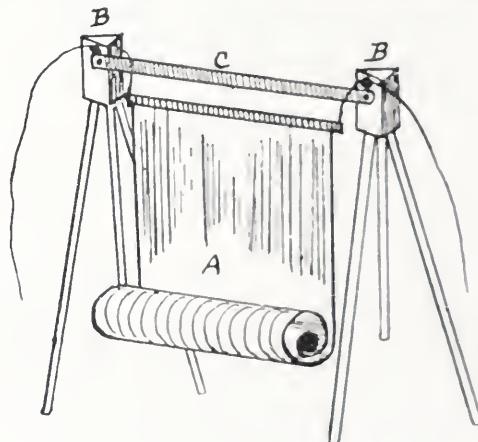


FIG. 2.

several ways of accomplishing this, but I will here mention one that seems to me to meet all requirements without being too cumbersome.

Cut two pieces of wood about 4 inches long in a triangular shape (fig. 2, B). These pieces should be about 2 inches in thickness. Now get six long pieces of good hard wood about 1 inch square. The length of these pieces will depend on the size of the screen. A screen 8 feet square would require these pieces about 9 feet long. Three of these should be fastened with hinges on the three sides of each of the triangular pieces of wood. The reason for this is, no doubt, apparent to the reader.

By opening the legs we have an arrangement similar to the ordinary tripod used for supporting the camera, but on a much larger scale. To prevent the legs slipping, fasten a small spike on each leg, or else place a piece of rubber at the bottom. To keep the stand firm, fasten a piece of wood about 1 by $1\frac{1}{2}$ inch on the two triangular pieces (fig. 2, C). The length of this piece will depend on the width of the screen, which it should slightly exceed. This should be fastened with two thumbscrews.

The next business is to fasten the screen to the support in such a manner so that it will pull up and down at will. The best plan is to fix two small pulleys on to the triangular pieces of wood. Fasten two long pieces of thick cord each end of the top of the screen (viz., the end with the lath fastened on), and pass the cord through the pulleys; erect the supports, pull both cords, and the screen will be raised into position, unfolding itself during the operation.

The foregoing remarks have been confined to the making of necessary apparatus, which I hope will render the task of the lanternist who has not too much money to spend on apparatus a little easier. As this article is written for those with little experience, perhaps a hint or two on the best way of getting over a few difficulties may not be out of place. It sometimes happens that the hall in which the exhibition is to be given is a long, narrow one. If the apparatus is placed in the centre of the room, the screen is partly eclipsed by the operator and lantern. This is more especially the case if an oil lantern is used, as with this illuminant the lantern cannot be tilted too much, and it is therefore necessary to have rather a high stand. To get over this difficulty, place the lantern and

stand on either side of the hall, and throw the pictures on the screen from that position. In order to get the pictures in focus, place the screen sideways a little, so that it is at right angles with the lantern. By doing this the operator does not in any way obstruct the view of the audience, and the difference will be hardly noticeable.

Another little hint: When tilting the lantern, always alter the screen in a corresponding degree, so as to get it at right angles, viz., move the bottom further back and fasten in the position required.

J. H. BURKE.

ACETYLENE.

PERADVENTURE it is winter time, and on the wrong side of the shortest day; there looms before you some months of almost endless nights, with murky days of the shortest duration sandwiched in between.

The number of sitters who have been just too late are on the increase, and, of course, you are too honourable to perform upon them with an empty dark slide.

You scratch your head—that is, if you are addicted to the habit—and hum a line or two of "The Absent Minded Beggar;" you look, perhaps, down the columns of your day-book, and think that if you had been able to have taken the last three sitters, you might have turned a middling day into a passably good one. The post comes in, and, amongst your letters, returned proofs, and re-orders, you find an illustrated price-list of acetylene gas apparatus; you scan it through eagerly, and have a vague remembrance of paragraphs in the JOURNAL on the subject.

The list will probably tell you that acetylene gas is far ahead of any other illuminant; in fact, equal to sunlight, and almost as cheap; the exposure required to take a negative is only two to four seconds, moreover, it is so portable that you can take the apparatus about with you in your waistcoat pocket to balls and parties, and earn a mint o'money in next to no time; in addition to your ability to use it in your studio, you can light up your shop, your reception room, your dark room, your every room; you can copy and enlarge with it, and work miracles generally.

No new fittings required; the old ones will do, with new burners. All you have to do is to buy a generator and studio outfit, send for the gas company's man to take their meter away, fix the generator, put in the new burners, light up, and you will have your place one blizzy-blaze of light at a cost of far less than coal gas, that is—ahem!—candle power for candle power.

To continue, you decide to go in for it; you send an order for the generator, the studio light, and a supply of nipples and carbide, not forgetting a cheque for something like twenty pounds, more or less. Meanwhile you call in the carpenter to erect a small house some distance from your insured buildings to contain the generator, and the plumber to run the pipes into the studio, and wherever else you fancy you would like the gas; you send your fire-insurance policies to the head office to get them endorsed, permitting you to use acetylene gas in buildings they cover; also to the local authorities for a licence to keep more than five pounds' weight of carbide on the premises. The inspector will call to see where you intend to store it, you will pay 5s.. and get your licence.

When the generator, &c., arrives, you are like unto a little child with a new toy, in a dicken's of a hurry to try it. The plumber is fetched poste haste, and unpacks and fixes the apparatus while you carefully read the directions, after filling it up with water and mixing a Winchester of glycerine with the water to keep it from freezing. You charge the carbide holders, turn on the taps as directed, and the gas-holder begins to fill. Rushing into the studio, you turn on all the taps to burn out the air in the pipes, and presently the light comes up bright, white, steady, and beautiful; you long for night to come, so that you can begin making negatives and a fortune.

Well, slowly but surely, and only too quickly for the printer, the night does come. You light up your window, your shop, your reception room, your studio, your dark room, your every room, and there is no mistake about the light, it is an illumination. You place your assistant in position, and propose to take his picture; you focus it up, put in the plate, giving it three seconds' exposure, proceed to develop, and you get—what? Nothing; that is, nothing of any use.

You stick up a couple of spare reflectors, and expose again, giving double exposure, with almost the same result; nothing daunted, again you try, giving an exposure of ten seconds, and the result is a negative of the soot-and-whitewash order; and, in desperation, you try again, giving a seemingly never-ending exposure of twenty seconds, and at last you have a printable negative, but nothing like a daylight one.

Next you try a head and bust, and, by putting the reflector close up to the sitter, the light nearer to his head, and exposing for fifteen seconds, you get a negative which, after retouching, could not be distinguished from one taken by daylight.

But what's all this smoke? Your model is coughing his head off, you commence to do the same yourself, and you see that the studio is full of a thick penetrating haze that plays on your lungs. You open the ventilators, turn out the lights, and go into the shop, to find that it is in the same condition; also there is a strong smell of onions or something pervading the atmosphere; you hold a taper to the taps of your gas brackets that you never knew to leak with company's gas, and find that

they catch fire round the tap in almost every case. Clearly, old fittings will not do. You make up your mind to call in the plumber in the morning. Later on a friend comes in, and you are explaining the light to him, when all at once the burners commence to send up a dense cloud of black smoke, which deposits soot on everything. Taking a lantern, you place it outside your generator house, so that its rays are cast inside, and, on opening the door, you find that the charge is exhausted and the holder empty. Being too tired to do more, you close for the night, only to find in the morning that the frost has done its work, and your generator frozen up in spite of the glycerine.

Disappointed and annoyed, you wire to the makers regarding the haze and the black smoke, and a reply reaches you to the effect that you omitted to order a purifier, and that you ought to use nothing but non-carbonizing burners.

The assistant is despatched by train for the purifier and purifying material and a dozen or two of non-carbonizing burners, and, while he is away, you swaddle up your generator house in sacks and matting, and, by gentle degrees, with warm water contrive to thaw the ice, and so unlock the machine. This done, you wash out the carbide-holders, which you find to be a dirty business, and, if your nostrils are delicate, an offensive one. You dry and recharge them, and hope for better times. By-and-by the assistant returns, and the plumber fixes the purifier and burners into their places. The day wears on, and, as it draws to a close, customers, who have been few during the bit of sun-shine during the fore and afternoon, come in a bunch. There is perhaps a group of two for three-quarter cabinets, a gentleman, in khaki for the first time, who requires full-length ten by eights, and a lady who desires fancy-lighted head and bust whole-plate plats. They are booked, and you say to yourself, "Now for it."

There is still a little daylight left, but certainly not enough to take a negative. You proceed to place your group of two in position, and, on looking at the focussing screen, you cannot see to focus nicely; so the acetylene is turned on, and by its aid you can make it painfully sharp if you wish. Everything being ready, you expose, and, as there is a certain amount of daylight left, you give six seconds; on developing, you find the negative to equal a summer negative of good quality. You next take the gentleman in khaki, with just as good a result. By this time it is quite dark. The fancy-lighted head delights you by the excellent effect of light and shade, and you find that, by moving the light around, almost any effect can be obtained. Moreover, the long exposure does not seem to inconvenience your customer one bit, and you think your money well spent, after all.

It takes some little time to find out what the light will do, and what it will not do; and, if you attempt only the possibles, you can have nothing but praise for the excellent illuminating powers of acetylene gas.

It will, on dull days, help you to get bright, clear, crisp negatives of anything, by assisting the daylight; when the day is drawing to a close, you can go on for at least another hour; and, when the daylight has quite gone, you can continue taking head and bust, and some three-quarter figures, when they happen to be favourable to the light, till morning if you choose; you can copy by it, and it is also very useful in the lantern.

It will not, by itself, take a group or full-length figure, that is if you want them equal to daylight work; and, of course, babies and animals are out of the question on account of the long exposures necessary.

Ten minutes' instruction will be sufficient to enable your man-of-all-work to relieve you of all trouble with the recharging of the generator beyond the drawing of a cheque occasionally for more carbide, which, although it rarely gives the five feet per pound, as stated in the lists of the various manufacturers, is still fairly cheap, as the cost of your light per sitter will be found to average about one penny; and, when once you are used to it, you will have nothing but words of praise for your installation of acetylene gas plant.

JESSE LANDON.

ON THE PART PLAYED IN PHOTOGRAPHY BY THE ACCOMMODATION OF THE EYE.

[Abridged from a paper before the Union Nationale at Rennes.]

THE eye accommodates itself to every object which it sees in turn, according to the distance by which this object is separated from it.

In looking at a picture or a photograph this accommodation is the same for all the planes represented, and depends only on the distance of the surface from the eye. It is the principal cause which militates against the illusion which the artist seeks to create.

This illusion of space represented on canvas would have no existence at all but that the picture falls within a zone of constant ocular accommodation, a region the depth of which varies with the distance of the eye.

The eye, in fact, resembles every other optical instrument in having a certain depth of focus, and therefore, at a given distance, a certain depth of field in which the accommodation of the optical organ is practically constant.

In order to obtain the maximum effect of relief in the different planes of the subject it must be placed in the position so that the foreground coincides with the picture, the distance depending on the distance away of the point of view of the observer. The depth of this region corre-

sponding to a given foreground can be easily calculated in terms of the physiological qualities of the eye. Its mean value is about 1 millimetre (.04 inch), for a distance of 5 centimetres (2 inches); 8 millimetres (.3 inches), for 20 centimetres (7.8 inches); 5 centimetres (.2 inches), for 40 centimetres (16 inches); after this it increases rapidly. At 1 metre (practically a yard) it is 50 centimetres, at 2 metres (2 yards), 3 metres, 50 centimetres (19½ inches). It is infinite at a distance greater than 3 metres.

As in photography, lenses of comparatively short focus are always used; these regions of accommodation are very small. The objects which make up the foreground are always considerably reduced in the image. This reduction is one-fiftieth if the apparatus is placed fifty-one times the focus of the lens from the subject. The eye sees them in the print as if they were objects of one-fiftieth the size, photographed at a distance equal to the focal length of the lens. The region of constant accommodation of nature is fifty times the depth of that which corresponds to this focal length. Hence the further off the foregrounds are, the more truthful will be the relief of the planes of the picture. The eye, however, will replace nature itself by a reduction of nature on the scale of the foreground.

In the case of a portrait, the illusion of relief is perfect if the portrait is obtained life size (either directly or by enlargement), and, if the focal distance is such that the zone of constant accommodation is at least ten centimetres (four inches), otherwise our imagination cannot reveal to us anything but the picture of a doll.

The part which accommodation plays in stereoscopy is still more important. Here the complete illusion of relief is possible when the foregrounds are of natural size, the two points of view separated as are the human eyes, and the lens of such focal length that the whole of the scene falls within the zone of constant accommodation corresponding thereto. Otherwise than has been described, the relief of natural objects can only be obtained in the case of objects smaller than life, as the foreground is more distant; in the case of objects larger, as it is nearer than the focus; and in all cases, in order that the effect may be natural, there must be a proportion between the focal length of the lenses and their distance apart on the one hand, and between scale of reproduction of the foreground and the depth of the region of constant accommodation corresponding to the planes of the subject on the other.

RECENT PATENTS IN COLOUR PHOTOGRAPHY.

DR. SELLE'S PROCESS FOR PHOTOGRAPHS ON FLEXIBLE SUPPORTS.

[No. 4290 of 1899.]

The following is Dr. Selle's own description: "I take a rigid waterproof plane of desired size, for instance, a glass plate, preferably somewhat larger than the finished print is to be by at least half an inch each way. One surface of this plate I coat around the edges to a width of, say, a quarter of an inch, with a solution of gelatine of, for instance, ten per cent. strength. I now take a sheet of paper, one side of which, at least, should be covered with a waterproofing material, and, after cutting it to the size of the glass plate, I place it on top of the latter (a waterproofed side being uppermost), applying pressure so that the edges of the paper may adhere firmly to the gelatine on the glass, care being had to expel any air from between the paper and the glass plate. If a non-waterproofed paper is used, then the latter should be cut slightly smaller than the glass, and should be placed for a few minutes in water prior to being put on the glass support. The paper being quite dry, and adhering to the glass plate, I cover it with a thin layer of an impervious material, which is as transparent as possible, for instance, collodion. On this film, when dry, I spread a very thin layer of plain bichromated gelatine, and allow it to dry. I then expose this plate to the action of light under either of the three negatives, say, for instance, the 'red' negative. The transferring of the image from the negative to the paper beneath it, i.e., the printing having been accomplished, the plate is washed in cold water, and is then placed in a bath consisting of the appropriate solution of, for example (if the 'red' negative was used first), five per cent. methyl blue, until the image is fully developed. The plate is then taken out of the bath and allowed to dry. When quite dry, the aforesaid coating operations with collodion and bichromated gelatine (which are here termed 'sensitising') are repeated. The plate is then printed under another negative, for instance, the 'green' negative, then washed, and placed in a bath consisting of the appropriate solution, say a three per cent. solution of fuchsin (red) until the image is fully developed. I thus have the red image on top of the blue image. The plate, after drying, is sensitised for the third and last time; it is then printed under the 'blue' negative, washed and developed in a bath consisting, for instance, of a seven and a half per cent. solution of helianthin (yellow). When dry, the photographic colour print on paper is finished; it is then cut all round within the edges of the gelatine, which was applied to the glass as first mentioned. The paper carrying the print will then come clear off the glass, and can be mounted like any ordinary photograph. The superimposition of the three negatives during the three printings is easily accomplished for the second and third negatives by holding the plate up

to the light, and making the contours on the negative coincide with the contours of the image on the plate beneath it; the plate and negative are then, during printing, held together by means of strong spring clips, instead of being placed in a printing frame. In case where thick opaque paper is used, it is desirable, as is done in multi-colour printing, to make corresponding register marks on the negatives, which will become subsequently reproduced on the positives, and serve to remove the difficulty of obtaining a true register."

CAPTAIN LASCELLES DAVIDSON'S THREE-COLOUR CAMERA.

[No. 3550 of 1899.]

The camera is constructed with a front plate, A, having the three lenses, B, B¹, B², all of the same focus. These lenses are each provided with the colour screens, B¹, B², B³, arranged behind the lenses, the colour screens being of the requisite colours required for three-colour photography. The camera is completed by means of the bellows body, C, and the movable back plate, D, adapted to receive the dark slide holding the photographic plate and being provided with a hinged ground-glass screen, E, which can be turned up out of the way when the dark slide is in place. For the purpose of dividing the camera into three compartments flexible partitions, F, are provided, having a certain amount of springiness, so that, when released, they will collapse and allow of the colour screens, B¹, B², B³, being got at easily. These partitions, F, are provided with rigid bars, G, each fitted at their ends into slots upon the back plate, D. These partitions, F, being of

Fig. 1.

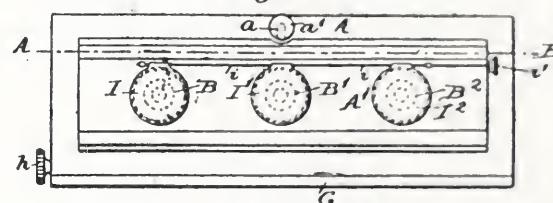


Fig. 2.

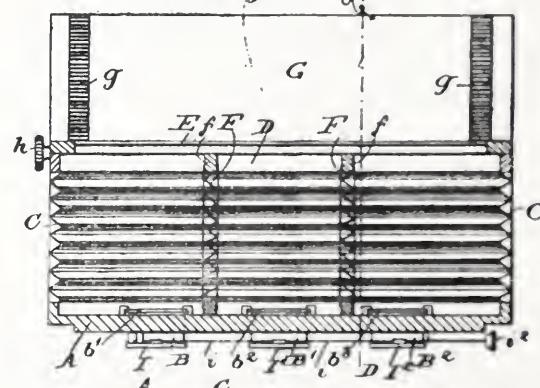


Fig. 3.



a flexible character, will therefore extend or collapse in accordance with the movements of the bellows body, C. The front, A, of the camera is attached to the baseboard, G, and the focussing is effected by the movement of the back, D, which is operated by pinions engaging in the racks, G, upon the baseboard, G, the milled head, H, serving for rotating the pinions. In order to effect slight adjustments of the lenses, B, B¹, B², they are mounted on a sliding frame, A¹, fitting in grooves in the front, A, of the camera, and the longitudinal slot, A, in which a milled screw, A¹, engages, allows of a slight vertical adjustment.

Shutters, I, I¹, I², are fitted to the lenses, B, B¹, B², and are connected together by means of a rod, i, operated by a milled head, i¹, so that all three lenses can be exposed simultaneously.

These lenses are provided with differently sized apertures and with stops, in order to allow for the differences required for the particular colour screen in use in each lens.

COLONEL OSBORNE POLLARD'S THREE-COLOUR CAMERA.

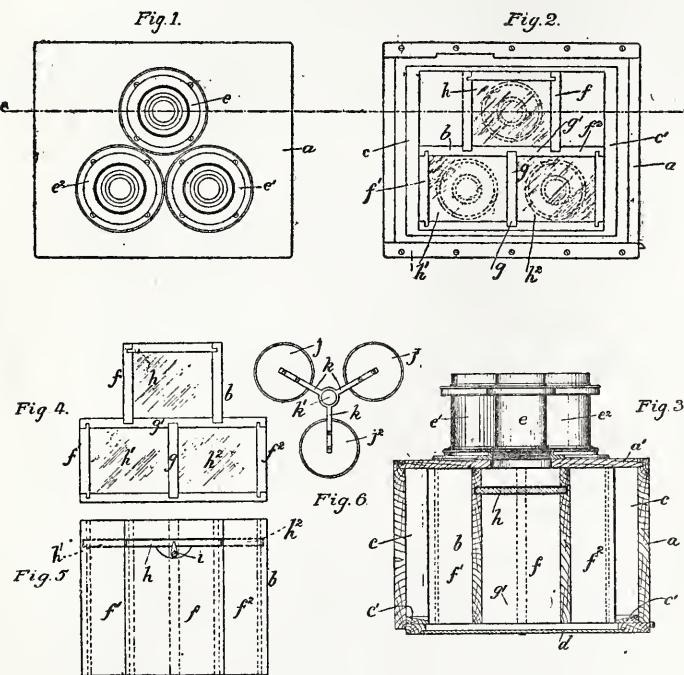
[No. 14,364 of 1899.]

The instrument consists of a rectangular body, A, with a removable inner body, B, which fits into place with a sliding fit. C are guides for the inner body, and c¹ is a guide frame at the back of the main body, A.

d is the usual ground-glass focussing screen; it is only shown at fig. 3. *e*, *e'*, *e''*, are three lenses arranged at the front of the camera, the lenses *e'* and *e''* being arranged one beside the other, and the lens *e* above and intermediate of the other two.

The inner body is divided into three boxes or chambers, *f*, *f'*, *f''*, divided off from one another by means of division pieces, *g*, *g'*. It will be seen that the arrangement of the chambers corresponds to the arrangement of the lenses, that is to say the chamber, *f*, is above and intermediate of the other chambers, *f'*, *f''*. At the front end of each chamber is a colour screen, and these colour screens are fitted removably in place, the colour screen, *h*, for the upper chamber, *f*, being passed through a slot at the upper side of the chamber, and held in place by means of a button, *i*, whilst the colour screens, *h*, and *h'*, for the chambers, *f'*, and *f''*, are passed through a slot at the side of each chamber, and are held in place in a similar manner to the screen, *h*. The screens consist of coloured glass, the screen *h* being red, the screen *h'* blue, the screen *h''* green.

What is claimed for this camera is that in colour photography three exposures can be made at the one time without the intervention of a



reflector as has hitherto been practised, and also that the camera can be used either for colour photography or ordinary photography as desired.

The front board, *a'* (see fig. 3), of the camera is removably fitted in place in the usual manner with cameras having movable front boards, so that, when it is desired to use the camera for ordinary photography, the front board with the three lenses thereon can be removed and replaced by a front board with a single lens thereon. The inner body is, in such cases, also removed, so that the camera can be used in the same manner as an ordinary camera.

Owing to the law of parallax, the camera, with its three lenses, is always in focus, that is to say, no focussing is required, as the camera can only be used for objects situated beyond a definite point, the point varying with the focal length of the lenses used.

The three simultaneous exposures are made by means of three caps, *j*, *j'*, *j''*, for the lenses. The caps are connected together by radial bars, *k*, which are connected together at the centre, and provided at this point with a knob or handle, *k'*. If so desired, a shutter may be used instead of the caps.

The necessary difference in the duration of the exposure for each of the colours is regulated by the size of the aperture of each lens.

PROFESSOR WOOD AT THE CAMERA CLUB.

THE February lecture programme at the Camera Club has been crowded with good things, and was of such a varied character that it may safely be said that he must be a man of singularly barren mind who could not find in it something to arouse his interest, if not enthusiasm. If he had no liking for "the discharge of electricity through gases," he could revel in "Niello work," and, if he did not like that, he could linger over "Some Aspects of Ancient Egyptian Art." If his tastes were not with pyramids and mummies, he was sure to discover something more to his palate in one of the other lectures announced, and, when all failed, he could secure a ticket for the Club House Dinner, with Sir William Abney as

its guest, which closed, on Tuesday last, the lectures for the month of February.

There is only one man who is entitled to grumble, and that is the individual who is mad on photography, the man who button-holes you on the staircase and asks how many grains of bromide you put into your developer when the temperature is something below 32° F.; the photographic bore that you flee from as you would from the wrath to come. There is method in his madness, at least, when he points to the programme and howls out in his agony, "Is this a photographic club, or is it a —?" You wait not for the completion of the sentence, but suddenly remember that you have an appointment in the billiard-room upstairs, and find yourself presently in the midst of a discussion with the marker as to the merits of the new pockets which have been fitted to the table.

Perhaps it was in deference to the aspirations of the mad photographer that one of the announced items of the February programme was postponed, and Professor R. W. Wood, of Wisconsin, was asked to give an account of his new colour process. Anyhow, the Club found itself, on Monday last week, listening with great interest to a lecture which embraced more than one subject, and with another Wood—Sir H. Trueman Wood—occupying the chair in his customary tactful manner.

The main subject with which Professor Wood dealt was his colour process, and as this has elsewhere been described in detail—for it is not the first time the lecture has been delivered—we need not enter into particulars. But we must say a word of acknowledgment as to the happy manner in which the lecturer presented his remarks. It was a clear exposition of a very difficult subject. Although the lecturer was not a good draughtsman, as he himself confessed, he handled coloured chalks with such deftness that he was able on the blackboard to make his meaning apparent even to those who knew nothing about the vagaries of diffraction gratings. Never at a loss for a word, he spoke rapidly, and was always ready with some apt and homely illustration which helped to point his remarks. There was also a piquancy in the unconscious introduction now and then of an unmistakable Americanism, as, for instance, "I shall be glad to answer any questions when I'm through."

In addition to the colour process, Professor Wood showed a zone plate, which he had obtained by copying by photography the concentric rings ruled upon a large sheet of cardboard. He explained the rule for making such a diagram, and showed how the zone plate could be used instead of a lens, both in the telescope and in the camera. In the former instrument it was possible to see details with it in the lunar craters, and with the latter he had taken some photographs with a zone plate which were projected upon the screen. These pictures of marshy ground and wintry trees were interesting curiosities, and he pointed out that, in consequence of the zone plate possessing two foci, the detailed images of the twigs were accompanied by a blurred image which looked as if the design had been rubbed in those places by charcoal and stump. Barring this peculiarity, the pictures had much the appearance of pinhole photographs, and the method may commend itself to those who are seeking something of a smudgy character for the next exhibition of advanced art.

But perhaps the most interesting, and certainly the most wonderful, pictures which Professor Wood showed were in connexion with a recondite subject which he originally brought before the Philosophical Society a year ago, namely, the photography of sound waves.

It is easy enough to photograph waves and ripples in water which are comparatively slow in movement and evident to the sight. With waves and ripples in the ambient air, which no man can see, and which travel at a rate of a thousand feet per second, it is very different. Professor Boys was, perhaps, the first to photograph anything of the kind, and he did so unwittingly. In his marvellous pictures of flying bullets can be seen the wave of compression bowed out in front of the missile, and the wave of rarefaction behind it, in addition to the beautiful ripple in the rear. Sound waves are of much the same character, only they are spherical in form, and Professor Wood set out with the expressed intention of securing them in his camera. The apparatus was simple, and consisted of an electric spark apparatus to give the sound or snap, and another spark to give the necessary light by which to secure the image. Nor was he content with the simple wave. His photographs showed the phenomena of reflection and refraction, and some showed how the wave was retarded by being partly sent through carbonic acid gas, or hastened by transmission through hydrogen. A beautiful example was that in which the photograph showed the wave striking a series of steps, and bounding off each so as to meet the ear with the periodicity necessary to produce a musical note. Professor Wood's lecture aroused much interest, and the vote of thanks passed at the conclusion of the evening was something more than a mere formality.

THE Paris Exposition will be brilliantly illuminated at night. There will be 3116 incandescent lamps at the great entrance gate in addition to twelve very large arc lights; on the cupola and minarets there will be eight search lights, and sixteen simple reflector lights upon the pylons. The Alexander III. bridge will be lighted by 508 incandescent lamps of 117 candle power. The electricity building will be lighted by 5000 incandescent lamps, eight search lights, and four plain arc projectors. On the water palace there will be 1098 incandescent lamps.

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THE LANTERN RECORD.

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LANTERN MEMS.

WHAT would the lecturer do without photography? This is the more emphasised every time one attends a scientific or technical meeting, for diagrams, no matter how skilfully drawn or produced, can never portray so faithfully as photography the salient points, and, even if details that are hidden from view in an apparatus have to be explained, a photographic projection is always more satisfactory than a diagram. This being a truism, some will say, Why refer to it?

* * * * *

IF the actual apparatus, machine, or instrument, cannot be shown to the audience or its size prevents its being seen by a large number of persons, the optical lantern and a photographic transparency then provide the necessary means, and, although some affirm that photography "can deceive," the majority will be perfectly satisfied that the view before them is correct and enables them to see the general design or examine details.

* * * * *

AT a lecture I recently attended at the Auto-mobile Club, I was impressed, from the photographs shown, by the wonderful progress that has been made in the design and construction of motor cars and carriages since I saw the demonstration organized by Sir David Salomons some two or three years ago at Tunbridge Wells; and, having seen the cars at Brighton that took part in the first trial run, I was doubly interested in Mr. Sturmey's capital paper on the subject of Motor Locomotion. That the auto cars have come to stay there is no question, and photographers will be adopting this method of travelling wherever something more has to be carried than can be comfortably placed on a bicycle or pedal tricycle. The trial of auto cars in the 1000 miles run at the end of the month, and the Exhibition to be given, before and after the same, in London and in the provinces and large cities during the actual progression from Bristol to the north and back to London, should create an interest in them and make still more popular.

* * * * *

I COULD not help contrasting the comfort of such places as the Auto-mobile Club and the Camera Club with some of the meeting places where scientific papers are read, and, although for a strictly technical meeting, lasting from one hour to an hour and a half at the outside, one can put up with the straight-back seat, cold rooms, or other discomforts, it is this sort of thing that is distinctly a draw-

back to a society that caters for the social as well as the technical side of a section of the scientific world. Enthusiasm is a good thing in new societies, and one ought not perhaps to find fault with having too much of a good thing; but certainly I had, and I think many others had, too much of two good things the other evening. Either of them by themselves was a feast, but both together after ten hours' ordinary business was too much.

* * * * *

A SOCIETY has been formed called the Optical Society, and Dr. R. M. Walmsley, F.R.S.E., gave a Presidential address which reviewed in a most interesting manner the work accomplished by opticians and in the optical world with its many allied branches, and particularly dwelt on the wonderful scope in what he called the "borderland of optics." This included photography, electricity, and X-ray work, and quite a long list of sections that the optician had to be versed in, or in which it would be wise for him to be well informed; while the modern requirements of military men and travellers enabled him to dwell on the improvements in prismatic field glasses, range-finders of various types, and other instruments—altogether a most useful *résumé* of work done, and which will be of value, not only to the optician, but all who are interested in scientific matters.

* * * * *

A MOST useful paper was read by Mr. Dixey on "The Centering of Spectacle Lenses," and illustrated by diagrams and apparatus. The technique was interesting to all, and the information given for the benefit of the junior members of the optical industry should be of great value to them. Opticians who make photographic lenses know the value of perfect centering, but spectacle-sellers often do not pay that attention to the correct centering of spectacle and pince-nez lenses that is so essential, for it must be borne in mind that for the best results a different centre is required for lenses used for looking at near objects to that for distant objects; in fact, when the higher powers or shorter-focus glasses are used for near work, a great gain is obtained, not only as regards the improved definition, but also in the comfort of seeing, by having the lenses decentered.

* * * * *

THOSE who, like myself, have had over thirty years' experience in all branches of a scientific optician's, and had some thousands of cases of eyesight-testing, can endorse this, and emphasise the necessity for all who have eyesight that is not perfectly normal to be most careful in the use of glasses. Nearly every case has some peculiarity, and must be taken on its own merits and arranged for separately. A glance at a file of prescriptions, arranged after a series of refraction tests, both with the optometer and Snellin's types, show what a wonderful diversity there is in the human eyesight.

* * * * *

THE *Globe* says, in its "Echoes of Science," that Professor Raoul Pictet, of Geneva, whose name is identified with the early lique-

faction of air, has now discovered a means of separating oxygen from nitrogen in air at ordinary pressure. It is a practical application of "liquid air," and the commercial apparatus can supply 500,000 cubic feet of oxygen, and over a million cubic feet of nitrogen, for an expenditure of 500 horse power. In addition, there will be a by-product of 1500 pounds of liquid carbonic acid, which, we may add, is now made by brewers for the market. Oxygen will be useful instead of air for heating up coal furnaces. It can be stored in steel tubes and transported to consumers. Nitrogen can be employed for the production of nitric acid and ammonia. The Pictet process is to be introduced into New York." Will this affect the supply of oxygen for lanternists' use? is the natural question asked.

G. R. BAKER.

LANTERN MATTERS.

A PLEA FOR LONG-FOCUS OBJECTIVES.

WHEN arranging for a lantern exhibition one of the first questions to arise is, What size of disc would be the most suitable for the occasion? and, seeing that the size of disc, or, what is practically the same thing, the size of the picture is controlled by two factors, viz., first, by the distance the objective is from the screen, and, secondly, the focal length of the objective employed, it follows that there is always more or less margin at an operator's disposal provided he has plenty of floor space at his command; and, this being the case, a large amount of useful work may be conducted with an outfit which possesses only one objective. It is generally admitted, however, that the most pleasing effects in lantern projection are obtained when matters are so arranged as to provide a disc which is as nearly as possible in size a fourth of the longest distance of the hall, and this standard of proportion will be found to apply to large and small rooms alike, and is one that nearly every lanternist of note has accepted as the proper one to work up to. A little thought will enable any one to see how nicely the rule will apply to both public halls and private rooms alike. Take, for instance, a small public hall of, say, fifty feet in length. Here a twelve-feet disc would be the most suitable; while, on the other hand, a private room of, say, sixteen feet in length, would be nicely suited with a four-feet picture.

In working up to this standard of one-fourth the greatest length of the room, it stands to reason that, if very or moderately short-focus objectives be employed, the lantern must be placed at a short distance from the screen. On the other hand, with lenses of longer foci, an operator must arrange his lantern at a greater distance; and here, again, a most important question arises, viz., What is the most suitable focal length of objective to employ in all-round working?

To answer this question, consideration must be given as to the most suitable distance to place a lantern in the room or hall.

When lenses of short focus are employed, it nearly always happens that the lantern has to be placed in a position where it is surrounded by the audience, and this is objectionable in more ways than one, for not only is much discomfort experienced by those spectators sitting in the rear of the lantern, but much useful floor space is taken up at what is nearly always the best point of sight, and which would be better placed at the disposal of the audience. On the other hand, when long-focus objectives are employed, they will permit of the lantern being placed at the back of an audience, and allow of a much greater amount of ease and comfort to an operator, as well as not interfering in any way with the point of sight of any of the spectators.

An idea prevails that a better light is provided when the optical arrangements of a lantern are such as permit of the disc being projected from a point somewhat near the screen. This opinion, no doubt, was held by a goodly number of operators several years ago, when gas bags were almost universally employed in lantern projection; but, with the introduction of compressed gas in cylinders and greatly improved forms of mixing jets, these old-fashioned ideas have ceased to exist, for, with the enormous pressure from cylinders, there is certainly no reason why the utmost brilliancy should not be attained when working from a stand-point at a considerable distance from the screen.

In the days of gas bags a good portrait combination of about six inches focus was looked upon as a most useful lens to employ in lantern projection, and one of our leading authorities on limelight matters is found expressing it as his opinion that, where only one objective finds a place in a lantern outfit, a lens of six-inches focus will probably be found the most useful for any one to employ.

Others, again, who do a large amount of professional work and whose opinion is equally worthy of consideration, simply by reason of their being expert lanternists, seldom think of employing an objective of such

short focus as six inches, and these are found steering what may be termed a middle course in preferring an objective of about eight-inch focus, and it is with either one or other of these objectives most lanterns are now supplied to amateur operators, notwithstanding they but seldom allow an operator to work so as to conform to the standard of yielding picture in size proportionate to a fourth of the room without inconvenience to spectators. In what may properly be termed "Home Working," for instance, a by no means uncommon size of dining, sitting, or drawing-room will be found to consist of twenty feet in length or thereabouts, a fourth of which would be five feet, and to yield this size of picture in such a room a lens of nearer twelve-inches focus will be found necessary; although much shorter-focus lenses are regularly found doing duty in such places, of course yielding much larger pictures, which are too often specially noticeable by the inferior definition which those short-focus lenses yield. Speaking generally, if pictures are to be provided that approach in size a fourth of the longest part of any hall or room, then it will be found that a twelve-inch lens will come nearest yielding the same with the least amount of inconvenience to spectator of any size of objective, simply by reason that it will permit of the lantern being placed at a considerable distance from the screen. A very little calculation will show how nearly a twelve-inch lens fulfils the requirements of the rule laid down, viz., providing a picture a fourth of the size of any hall. Take, for instance, a large hall of, say, eighty or hundred feet, and when either of these distances is multiplied by three and divided by twelve in conformity to the standard formulæ, in each case working from behind an audience, we get a disc always in a proportion to one-fourth the longest distance. The larger the hall, of course the larger the picture necessary, and, no matter what be the size of the room in which an exhibition has to be given, a lens of twelve-inches focus will be found to work almost exactly to the standard size so long as transparencies of three inches in dimensions are being projected, and for many years I have found a good portrait combination of twelve inches focal length the most generally useful of all projective lenses.

Circumstances will arise in which, owing to obstructions in the line of sight, as well as peculiarities in the shape of a building, a shorter focus lens would be desirable; but this objection holds good in the same degree with short-focus lenses as with long, and it often happens a long-focus objective enables an operator just to cut clear of some obtruding object, such as gas bracket, &c., where with only a shorter focus the same would yield nasty eyesores on the screen. With, however, a really good long-focus portrait objective an operator has the power of manipulating the combination as will enable the objective to be utilised as a shorter-focus objective. In most treatises on lantern projection the information is given that, when an objective is required of longer focus than the entire portrait combination is yielding, the front lens may be utilised by unscrewing the back lenses of the combination and using in their place the front lens only, convex side next the slide. This generally provides a fairly good single-lens lantern objective of nearly double the focus of the entire combination, and when used with a suitable stop at the proper distance in front of the lens, so that the stop merely cuts off the more oblique rays, very fair definition is obtained and also very good illumination; few, however, if any, of these handbooks on lantern projection give the information *how to manipulate a portrait combination so as to shorten its focal length without adding an auxiliary lens to the same*, and, when the entire combination is of about twelve inches, can with the greatest ease be reduced to a focal length of about eight inches or so.

To accomplish this shortening of focus, unscrew the back portion of the combination and then remove entirely the inner portion and use the lens with the front and back lenses in their regular place without the flint concavo-convex, which has been removed from the back. Exception may be taken to this procedure on purely optical reasons, but in practice it will be found to work remarkably well, and my twelve-inch objective has often been so used, giving really good definition without any stopping down even.

A twelve-inch portrait combination is therefore probably the most serviceable lantern objective any one can acquire. It should be borne in mind, however, that, when long-focus objectives are employed, care should be observed in seeing that the condensers are of rather long focus than are generally fitted to lanterns carrying six-inch objectives.

T. N. ARMSTRONG.

THREE-COLOUR PHOTOGRAPHS APPLIED TO THE CORRECT DELINEATION OF NATURAL HISTORY SUBJECTS.

The above is the title of a most interesting paper read before the Croydon Microscopical and Natural History Club by Mr. Saville Kent, F.L.S.

Z.S., of which the following is an abstract. The three-colour process, as its name implies, involves the employment of three-colour printing only in conjunction with a proportionate abbreviation of time occupied in its mechanical accomplishment, compared with the older and more laborious system of chromo-lithography.

It is, moreover, an essentially photographic method, three separate negatives of diverse but scientifically gauged intensities being taken of each subject, and the combined colour printings or positives from these negatives having a corresponding but complementary colour ratio.

The scientific principle upon which the very remarkable colour reproductions now obtainable have been rendered possible owes its origin to the late Professor Clerk-Maxwell who, as long since as the year 1861, demonstrated the fact that all the colours of the solar spectrum, and concurrently all those of nature, are the equivalents of an admixture in varying proportions of the three primary colours of the spectrum, viz., red, green, and blue-violet; and it is only of late years that Clerk-Maxwell's discovery has been found capable of practical commercial application. Among those who have contributed most extensively to both the theoretical and practical utilisation of this three-colour photographic process, the names of our own countryman, Captain Sir W. Abney, Frederick Ives, of Philadelphia, Professor Joly, of Dublin, and Lumière, of Paris, are most eminently notable.

Mr. Ives's investigations led to the production of that ingenious instrument the photo-chromoscope, or kromskop, as it is most popularly called, by which negatives taken through red, blue, and green-coloured glasses are viewed by means of reflectors through glasses of the same tint, with the most realistic fidelity. Mr. Ives has also invented a kromskop intern, by which through coloured glasses similar realistic images can be projected on the screen; but, after all, these are but intangible images, which cannot be represented without the aid of the complex and costly instruments devised by their inventor. To meet popular requirements and general application, natural colour pictures or lantern slides that are available, like monochromes of the ordinary type, for individual handling and examination or for projection by any ordinary optical lantern, have been the desideratum.

Substantial progress has now been made towards the achievement of his much-desired goal. Ives himself was among the first to produce such tangible natural colour lantern pictures. Mr. Bennetto, of Cornwall, has produced noteworthy results; in both cases the positives are printed on three transparent primary colour carbon tissues, which were then superimposed in correct register. Lumière, of Paris, has employed stained collodion films consecutively printed in correct register on top of one another with the accomplishment of the same object. There yet remains to be mentioned the very ingenious adaptation of the three-colour process invented by Professor Joly, of Dublin. In accordance with his system, the three primary colours are all included in alternating microscopically minute parallel lines ruled on a single original or *taking* screen, and, in the reverse or complementary order, in a corresponding viewing screen, which has to be bound up in perfect register with each resulting positive. But the aggressive prominence of the ruled colours is undoubtedly a fatal obstacle to the utilisation of the Joly process or the colour registration of subjects requiring scientifically accurate production of their minute details.

Neither of these systems, however, fulfils the requirements of easy practical application and scientific accuracy that is in demand, but the following process, according to Mr. Saville Kent's personal experiments and experience, does appear to hold out the most encouraging future prospects. Modifications of the Ives transparency system have been devised by Mr. Sanger Shepherd, the essential details of whose process will be found in THE BRITISH JOURNAL OF PHOTOGRAPHY for December, 1899. The practical applications of this Sanger Shepherd lantern-slide process are so far assured, that all the materials and instructions for its employment are now obtainable through all the ordinary commercial channels.

Mr. Saville Kent then proceeded to illustrate his subject by means of slides thrown on the screen, which were the outcome of his own experiments with this process, explaining first that the negatives from which they were produced were all taken in trifolia colours through a set of coloured screens as shown, and the positives printed from the three consecutive negatives taken have, in corresponding order, to be printed on stained the complementary colours of blue, red, and yellow, and are then carefully superimposed to produce the natural colour replica.

The slides now shown will demonstrate the practical utility of this process for the correct delineation, or perhaps, rather, counterfeiting, the natural aspect of the objects photographed, and these slides, fifty in number, illustrate all the leading branches of national history. Among

floral objects, the orchids come largely to the fore, dendrobium, masdevallia, cypripedium, and eattleya being specially noteworthy. Various tropical butterflies associated in nature with these orchids were included in this series. More ordinary floral types, including a bright crimson bloxinia, associated with a brilliant blue morpho butterfly, a vase of lilac, and several groups of tropical waterlilies, of abnormal plant form, two typical species of the genus stupelia, or so-called passion flowers of South Africa, the one, *S. variegata*, resembling a spotted star-fish, and the other, *S. psomoensis*, clothed with brown furlike hair, were of special interest. It was explained by Mr. Saville Kent that the carrion-like odour of these flowers attracted flies, who in that last-named species more particularly deposited their eggs freely upon them, apparently under the impression that the malodorous blossom with its hairy clothing was the skin of a defunct quadruped. A group of scarlet-and-white spotted fungi from the Shirley Woods, for which the exhibitor was indebted to Dr. Franklin Parsons, concluded the botanical series.

Among the various forms of butterflies and moths, that of our familiar Red Admiral, *Vanessatalanta*, complacently resting on a cabbage-leaf, was more particularly admired.

Mr. Saville Kent then showed some lizards from Australia, Algiers, and Egypt, of which he has an extensive collection, and also the so-called Deguexin from Central America, which he has demonstrated has the habit of running bipedally, after the manner of a bird.

Fish were found to lend themselves very appropriately to this three-colour photographic process, and very fine examples were shown of gold and silver carp, a red-spotted plaice, and a John dory in the act of engulfing a small rock fish. A very successful group, called *A Spring Idyll*, consisted of a bank of primroses with a couple of brimstone butterflies toying over them, while, ensconced in a sheltering corner of fern leaves, a young leveret was inquisitively watching the sporting butterflies.

Bird life too was well illustrated. The so-called Australian wrens, showing brilliant blue, black, and scarlet coloration, and the little emu wren, of a more sober brown, formed appropriate subjects for this process. These were photographed in connexion with Australian acacias and other flowering plants indigenous to their native habitats. A justly admired peacock's feather, in which the characteristic tints were most realistically reproduced, brought Mr. Saville Kent's highly appreciated lecture to a close.

ORTHOCHROMATIC PHOTOGRAPHY AT THE PHOTOGRAPHIC CLUB.

On March 21 Mr. E. Sanger Shepherd gave a lecture, under the auspices of the Affiliation, upon the subject of "Orthochromatic Photography." He commenced by showing upon the screen a glaring example of a difficult subject for reproduction by photography in its true values, namely, a picture coloured in crude yellows, reds, and blues. For the ordinary plate no more difficult subject could be chosen. The next slide showed the best out of eight negatives taken on ordinary plates in an attempt to photograph the test object, and this, as might be expected, was a ghastly failure looked at as a representation of the luminosities in the original. The reason so bad a translation is obtained lies in the fact that the ordinary plate is sensitive to only a very small proportion of the spectrum. A comparative slide was shown in which at the top was a rough imitation of the spectrum, under this a photograph of the spectrum representing the luminosity of the spectrum of white light to the human eye, the maximum being in the yellow, decreasing rapidly towards the red, and gradually the other way to the violet end. Under this was a representation of the preceding negative in the form of a curve. It is very difficult to illustrate in a book, by half-tone or varying densities, the differences in the density of different parts of a negative, so that, as a rule, a curve is plotted to convey the desired information. The enormous intensity of the yellow of the spectrum in comparison with the blue and violet was plainly shown. The next slides showed comparative results on the spectrum plate and an ordinary plate, greatly to the advantage of the former, which gave a far nearer approximation to correct rendering of luminosities than was possible with the ordinary plate.

The principle underlying orthochromatic photography is that certain dyes added to the emulsion alter the spectrum sensitiveness of the plate. The dyes fluoresce and render the emulsion capable of being influenced by light which would otherwise fail to affect it. The new Cadett plate is practically sensitive through the whole length of the spectrum, and that evenly. At this point a most instructive series of plates was shown. Against the spectrum plate, which, as mentioned before, has an almost

even sensitiveness throughout the spectrum, were matched various commercial brands of plates. In one there was a gap in the green, where no action had taken place, but a high red sensitiveness, so high that red light was unsafe for development and a green light was substituted. In most of the tests shown the blue was far more intense than it rightly should be for its luminosity. One plate showed red and green sensitiveness fairly, but too strongly in the blue. It becomes necessary in such cases to lower the action of the blue to allow the red and green to catch up. This would be done with a colour filter, and the whole brought into harmony. It was seen from the experiments and explanations that the Cadett spectrum plate provided the best means with which to begin experimenting for the perfect rendering of colour values in nature according to their luminosities. Mr. Sanger Shepherd then went at length into the method of adjusting screens and measuring the results advocated by Sir W. de W. Abney, which was of great service.

By these and other means it becomes comparatively easy to make filters which will give action in any part of the spectrum. Mr. Sanger Shepherd then showed the method of measuring the luminosities of any colours by means of adjustable sectors of black and white card, the relative quantities of which are adjustable, mounted with the colour to be tested on a spindle and rapidly rotated by an electro-motor. The black-and-white blending produce a grey, the depth of which can be altered by increasing or decreasing the white sector, until it matches the luminosity of the test colour. Mr. Shepherd then projected several single slides, made by superimposing three dyed films representing the three primary colour sensations, naming the screens used and the complementary colours in which they were printed.

In answer to several queries, he strongly warned those taking up orthochromatic or colour photography against the use of hydroquinone for development. It possessed the peculiar property of bringing up the parts of the image formed by blue light at an early stage, and, although the other colours caught up in time, there was the disadvantage that the time of development, which was important in this work, was materially altered. The question of dark-room illumination was rather a bogey. Plates would not be appreciably affected by the use of a fairly bright light if one followed the custom he now adopted, namely, of developing all negatives for colour work inside of three minutes.

Where a proper safelight is used, the plates may be exposed to it for fifteen or twenty minutes during development if conditions so require. As a rule, his negatives were completely developed in forty-five seconds. Metol was used, and with it anhydrous carbonate and anhydrous sulphite of soda. The latter being rather difficult to obtain, crystals may be substituted, but each batch of developer should then be tested, because the amount of water in the salt varies considerably with different samples. For colour work he never used bromide. The amount of sulphite used had a bearing upon the time of development, and the influence of different quantities was enormous, as does the amount of water it originally contained. Two samples from the same firm, recently used, gave in one case a negative of full density in one minute, while the other gave only a ghost of an image.

Some discussion ensued respecting the origination of the principles of orthochromatics, and Mr. Mackie gave credit to the late Dr. H. W. Vogel. The tale was that Col. Stuart Wortley had an idea that, by staining the plate, halation might be overcome. He sent some plates so dyed to Dr. Vogel, who noticed that they showed quite a different colour sensitiveness to undyed plates. Following this discovery to a logical conclusion, he laid the basis of orthochromatic photography, and he only regretted that his due reward had not been received from all quarters.

A vote of thanks to Mr. Shepherd concluded the meeting.

PHOSPHORESCENT SULPHIDE OF STRONTIUM.

ACCORDING to a French contemporary, M. Josè Mourélo has presented to the Académie des Sciences an account of his method of preparing a phosphorescent sulphide of strontium. The same experimenter has previously shown that certain substances, such as carbonate of manganese and sub-nitrate of bismuth, in small proportions, have the property of exciting the phosphorescence of strontium sulphide. In his recent experiments with sulphate of manganese he has succeeded in obtaining a brilliant phosphorescence. The method of preparation is as follows: A mixture is made of 100 grammes carbonate of strontium, 30 grammes sulphur, and 0·2 gramme sulphate of manganese, pure and anhydrous; these are well mixed and put into an earthen crucible, well closed. The crucible is heated to a bright red for three hours. In this manner a sulphide of strontium is formed which is almost white, hard, and

possessed of an intense yellow-green phosphorescence, which may be excited by the exposure of a few seconds to diffused light. The experimenter describes several other methods of preparation, by which he has progressively arrived at results even more satisfactory. He takes, for instance, 100 grammes carbonate of strontium, adding 50 c. c. of water in which has been dissolved 2 grammes of dry sodium carbonate and 0·5 gramme fused chloride of sodium. After desiccation the mixture is calcined, and to the impure strontia resulting is added 30 grammes of sulphur and 0·2 gramme sulphate of manganese. By submitting this mixture to an intense heat a sulphide of strontium is obtained whose phosphorescence is more brilliant than in the former case, and it is excited with less exposure to light. The experiment which has given the best results is the following: With 100 grammes of carbonate of strontium is mixed a solution of 0·2 gramme sulphate of manganese in 50 c. c. of water; to the mixture is added 30 grammes of sulphur, 0·5 fused sodium chloride, and 2 grammes sodium carbonate. This mixture, heated in a crucible to bright redness for three hours, gives a sulphide which is rather white, hard, and granular, possessing a very great phosphorescent power, it being excited by the smallest exposure to diffused light.

CURATIVE PROPERTIES OF LIGHT.

ACCORDING to a contemporary, Dr. Mount-Bleyer, of New York, is of opinion that pure air, sunlight, and concentrated electric light will improve any case of tuberculosis. The best thing a man dying of tuberculosis can do is to buy an old greenhouse, put some blue glass in the roof, and walk around naked in the sunlight. But even this treatment can be improved upon. I was led to my electric-light cure, proceeds the Doctor, by my experiments on animals. Then I took men and women who had tuberculosis, and placed them in houses especially constructed with blue glass roofs; in fact, I built a solarium at Liberty, N.Y., a great glass building, which looks like a horticultural conservatory. My patients were drooping plants, which I attempted to nurture. They walked around in the rays of blue sunlight, and improved wonderfully. Most of them got well. Then, I argued, if blue light was so beneficial to consumptives, why not provide it for them artificially and in concentrated form? I procured a powerful arc-light concentrating lantern. Its candle power must have been 10,000. I used it on my consumptive animals, sending its rays through blue glass. The effect was remarkable. The beasts were made well much more quickly than in blue sunlight. It was equally beneficial to human patients. Next I dispensed with the blue glass. Instead, I caused the light to pass through large jars filled with chemical fluids, which absorbed all the light rays in the lower end of the spectrum, for I found that only the blue, the indigo, and the violet rays exert an influence on the movement of the spores. If a vessel containing a deep coloured solution of ammoniated copper oxide, which transmits only blue or violet rays, be placed between the source of light and cultivated spores, the spores are seen to react, just as they will when placed in contact with ordinary white light. On the other hand, they do not react at all to light which has passed through bichromate of potassium solution, through the yellow vapour of a sodium flame, or through ruby or red glass. I am able, therefore, to control the reaction of spores under light rays merely by interposing various solutions in the path of the light. Now, there is no difficulty in passing the rays through the human trunk to the lungs. We know that the cathode rays force their way through opaque bodies that ordinarily arrest the transit of sunlight. Röntgen has told us that, unlike sunlight, these cathode rays do not undulate in waves, but pass, as it were, backward and forward. To this, probably, is due their penetrating power. So we have the means of projecting the rays, with all their therapeutic properties, right into the lungs of the consumptive; in other words, it is possible to operate on his lungs without opening his body. Light is inimical to the development of the harmful organisms. The action of light entirely destroys the bacteria or reduces them to a condition of torpidity which they require months to overcome. A 22,000 candle-power light has been built for the doctor, with which to treat persons suffering from tuberculosis.

PRACTICABLE PHOTO-MICROGRAPHY.

[From the *Journal of Applied Microscopy*.]

By "practicable" the writer means simply possible and successful day in and day out—with all kinds of objects, tissues often miserably stained, thick sections lacking contrast, bacteria or the evasive *Amphipleura P.*, or even that *bête noir* of a generation gone by, the *podura scale*.

Photographic annuals, text-books, and even catalogues are sounding the praises of cheap and simple apparatus to the unwary victim, who begins to believe "any one can do it," and wastes time, money, &c., and then declares the whole thing a failure, and sticks to "diagrammatic drawings" for ever as the correct thing. So that, after many years of work, with many failures and a few successes, the writer will not be thought over-conservative if he advises only the best in the way of work room, apparatus, luminant, and technique.

Van Heurck may have done good work in photographing diatomaceæ with a vertical camera, but Nelson has far surpassed him in the same field with a horizontal apparatus.

The writer possesses a vertical camera, made from Van Heurck's model, but it has only 420 mm. space possible between plate and ocular, so that various magnifications can only be obtained by high-power objectives or, what is worse, high eye-pieceing. One recent experience will illustrate, the writer being called upon to photograph a specimen of "hydatid mole" cut at 25 micra, poorly stained, where only high magnification (400 diameters) would satisfy the author of the article—and the syncitium cells alone well differentiated, the rest of the section a myxomatous tangle. High-power objectives and oculars would do nothing in such a case, but a 12 mm. 65 n.a. apochromat, with No. 3 projection ocular and 1800 mm. camera extension, gave a fair negative, and was published.

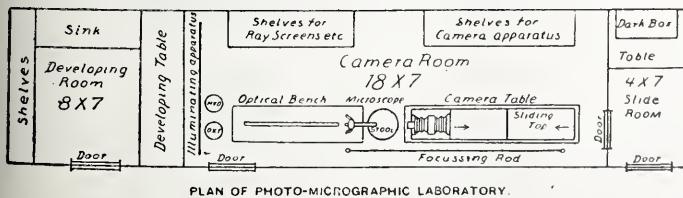
While fairly good work has been and will be done by our best workers with comparatively poor apparatus, it does not pay in these days of nerve stress for a valuable worker to sacrifice himself trying to do the impracticable when it is not necessary, and an occasional success does not compensate for many sad failures, with loss of time, money, and vitality.

What the writer means by "best" will be explained most simply by a brief description of his own work place, apparatus, light, and technique, as he possesses them.

Work place : a cellar with cement floor, brick walls, plastered ceiling, and running water; no vibration. The room, or rooms (three in number) are arranged side by side, 30 feet long, 7 wide; the first, plate-loading room, 4 x 7; next, camera room, 18 x 7; and last, the developing and printing room, 8 x 7, with no communication except from plate-loading room to camera. The developing and loading room are usually combined, but we find it better to have separate rooms and avoid possibility of hypo dust, &c., on plates. The rooms are all built with hollow walls of dull black paper on a wooden frame, ensuring perfect ventilation and being light-tight. The temperature does not vary 15° the year through, and no frilling or fogging of plates occurs because of excess of temperature.

As to apparatus, we have already given our decided preference for horizontal table and camera, so only need give brief description: two tables end to end, 18 inches apart, one, 5 feet long, carrying light, optical bench, and microscope; the other, 6 feet long, carrying only the camera, fastened rigidly together after proper alignment.

The optical bench carries illuminating medium—either Welsbach gas lamp or oxyhydro zirconium light, as the case may be, the first for low-power work and careful arrangement of microscope and object to be photographed, preliminary to high-power work and use of more powerful illuminant; the oxyhydro light can be slipped on in place of the Welsbach, and in a minute we are ready for exposure.



PLAN OF PHOTO-MICROGRAPHIC LABORATORY.

While we have a very fine heliostat, most of our work is done at night for various reasons, and oxygen and hydrogen under pressure are all that are needed—far better than electric arc lamp for our work. Hard lenses are used for some ordinary work, as the zirconium is very expensive and breaks easily.

The optical part of the bench consists of the usual collecting lenses of Jena glass, with light filters, cooling cell, iris diaphragm shutter, &c., all movable on the rail.

The microscope, which is used for no other purpose, sits on a sole plate, which is rigidly attached to the table, and is adjustable in all directions—English model, tripod foot, made by Watson & Sons, especially for this work, having mechanical stage and all possible improve-

ments. Between this table and the camera table is a stool at the proper height for easy observation and manipulation of the microscope. The focussing rod runs at the left side, independent of the camera, the full length of the camera table, moving the fine adjustment of the microscope by means of a loose leather pulley running on a grooved wheel 3 inches in diameter, without the slightest strain on the microscope. The camera table proper is 6 feet long, with a sliding top 7 feet long, to which the camera is fastened, running on its own rails—the whole top sliding smoothly on wooden runners to and from the microscope as needed, so that one can sit down comfortably at the microscope, select the desired area to be photographed, then move the camera up to the tube of the microscope, clamp all rigidly together, and proceed.

Before describing the camera, we will bring before our readers a simple piece of apparatus, possibly original with the writer, which has been found such a help that we are glad to publish it.

Running on the camera rails back of the entire camera is a wooden frame carrying an 8 x 10 photographic plate, exposed for a minute to white light with a white paper before it, in other words "fogged white," left undeveloped, giving a pure white surface with just enough grain to show details exquisitely. The top of the table carrying the camera is marked off carefully, showing various magnifications with different objectives, with and without oculars, and to use this screen the whole camera is closed up close to ocular of microscope, plate-holder and inside diaphragms of camera removed, the screen moved to the mark showing desired magnification and the image projected upon it in far less time than it takes to write.

The only light in the room coming through the microscope, the section can be studied, rearranged if necessary, cells accurately measured, as the screen is ruled to mm., equality of illumination guaranteed, &c., then this screen is removed, and the camera back with plate-glass focussing screen slid into the same mark, the final focussing done with achromatic focussing lens on plate-glass focussing screen, plate-holder substituted and exposure made—no failures, simplicity in every detail, with fullest assurance that one knows just what is being photographed, having seen its actual details projected on just the same surface as the sensitised plate which is to be made into the negative.

The Camera proper is the large "Complete" horizontal one, made by Messrs. Bausch & Lomb, with several improvements kindly made at our suggestion, giving a camera extension from 400 mm. to 2000 mm., more than answering any demands that can possibly be made upon it.

The plate-holder is perfect, and with a plate-glass focussing screen cross-ruled to mm. can be used for the most critical work, magnifications being obtained with a fairly complete battery of objectives from 25 to 4000 diameters, using no higher than 2 mm. immersion objective and No. 6 projection ocular.

To the question arising in the mind of our reader, Why is such a camera extension necessary? we reply simply that high magnifications (all over 200 diameters of some objects can only be obtained by the use of low-power (12 mm. and lower) objectives of best n. a. with long camera extension, for in photo-micrography "depth of focus" or "penetration" means everything, and as this valuable quality (absolutely necessary in sections over 5 micra thick) decreases with increase of n. a., we must compensate by special technique in other ways.

CHAS. H. POTTER, M.D.

POLARISED LIGHT.

In the course of a recent lecture on this subject at the Royal Institution, Lord Rayleigh said that double refraction, the first phenomenon that led up to the discovery of the polarisation of light, was observed by Erasmus Bartolinus. A crystal of Iceland spar or a thin slice of tourmaline is generally employed in order to get double refraction of a beam of light. If, for experiment, a thin slice of tourmaline be arranged in a lantern so that it allows light to pass through perpendicularly, two images may be obtained. If another thin slice be now added, the light passes through partially; but, on turning round the second at right angles to the first, the part where they overlap is quite dark. This experiment shows the many-sided character of polarised light. In considering wave-motion, three main characteristics have to be borne in mind: (1) the wave-length, which has nothing to do with the direction of the light or the distance traversed, but is applied to the distance from the crest of one wave to the crest of the next; (2) the velocity of propagation; (3) the periodic time, the distance which a wave advances in unit time.

The vibrations of light are transverse, and not like those of sound, longitudinal. This statement is seen to be correct, because otherwise

the phenomenon of polarisation would be unexplained. When the refracted and reflected ray together make a right angle, then the best conditions are obtained for getting polarised light. Brewster formulated a law which is of great importance, the angle of incidence of light on water must be such that the tangent is equal to the index of refraction. Light may be oppositely polarised; it should be mentioned that in this connexion the opposite of north and south is east and west, and not south and north.

In order to demonstrate the polarisation of light, a board about thirty feet in length may be placed in a vertical position. At a distance of about three feet from the top a bar is fixed transversely at about three inches from the board, so as to allow a long rope hanging from the top of the board to pass between it and the bar. The rope may be manipulated from the ground; on giving it a succession of shakes at right angles to the board, waves are set up which are stopped by the bar; but when the rope is shaken in a direction parallel with the board, from side to side, the waves pass beyond the bar. By shaking the rope in a circular manner, a compound wave runs along it, part of which, the perpendicular component, is stopped by the bar, but the remainder, which is a horizontal wave, travels beyond the bar. Again, if the bar be replaced by a grating of parallel bars arranged at right angles to the board, and the rope similarly shaken, it will be found that waves perpendicular to the board pass through the grating, and horizontal waves are stopped by it.

These preliminary experiments form an introduction to the subject of the polarisation of light. Just as a circular motion set the rope vibrating with a compound wave, so light may vibrate transversely in two directions—say, north and south, and east and west. Light, on passing through one Nicol's prism, vibrates in one direction only; on passing it into a second Nicol's prism arranged at right angles to the first, no light passes through, since that which was vibrating in the second direction is now cut off.

THE LATE PROFESSOR PEPPER.

PROFESSOR PEPPER, who recently died at his residence, Colworth-road, Leytonstone, is best known to fame as the exhibitor of "Pepper's Ghost," which, when it was produced at the old Royal Polytechnic, realised 12,000*l.* in the first six months. He was not the inventor of the idea, which was brought to him by an engineer named Dircks, but he was responsible for its popularisation. The mechanism of the idea was as follows: A stage was used on which living actors walked. Underneath the stage was an arrangement of mirrors fixed at certain angles which threw a phantom representation of a real man upon the stage above. This phantom was cast on a sheet of transparent plate glass in front of the stage, so that, when the real actors passed behind the phantom, they gave the effect of passing through it and yet not obscuring it, the most creepy sensation in ghost-land. When this novelty first came out, it was a huge success; but it has already been supplanted by newer and more up-to-date methods. Professor Pepper was for many years a lecturer at the Royal Polytechnic Institution; he travelled with his show in America and Australia, and became public analyst in Brisbane.

In an interview with Mr. J. N. Maskelyne, published in a daily contemporary, that gentleman said he knew Professor Pepper very well. "He was the first person to bring ghost entertainments before the public. The scenic ghost was not his own invention, though, as many people imagine. We owe that to a civil engineer named Dircks, who took the idea to Professor Pepper, and he, seeing its possibilities, at once patented it. Being the first to bring the ghost before the public, he made a great deal of money out of his displays. He used to license travelling showmen, who all placarded their caravans, as some do to this day, with gilded letters announcing 'Pepper's Ghost.' Pepper himself did not travel with caravans, as is popularly supposed. He gave his entertainments in public halls. Originally he had been a chemist, and for many years he was a lecturer at the Polytechnic. He tried his hand for a time with ghost shows at the Egyptian Hall, but he seems to have lost heavily over the transaction. Afterwards he went over to Australia with his scheme for creating rain by throwing explosives into the clouds. That also was an unsuccessful venture. When he returned to England, he asked me whether I could find him anything to do here, but by that time he was too much out of date to be of service as a public entertainer. The fact is, Pepper's methods for creating illusions are quite obsolete, and could never hold their own for any time before an intelligent audience. He simply got his ghosts by a simple arrangement of glasses and mirrors, but now we never use glass to get illusions, for the most ingenious effects which can be produced by glass could be detected at once by any one in the audience acquainted with the principle of optics. There is no doubt Pepper's ghosts in their day were very successful. They were novel and could be made very amusing. In fact, I enjoy them myself to this day, but, you see, too many people know how it's done to make such shows of any use nowadays. When Pepper first began, speculation was very rife

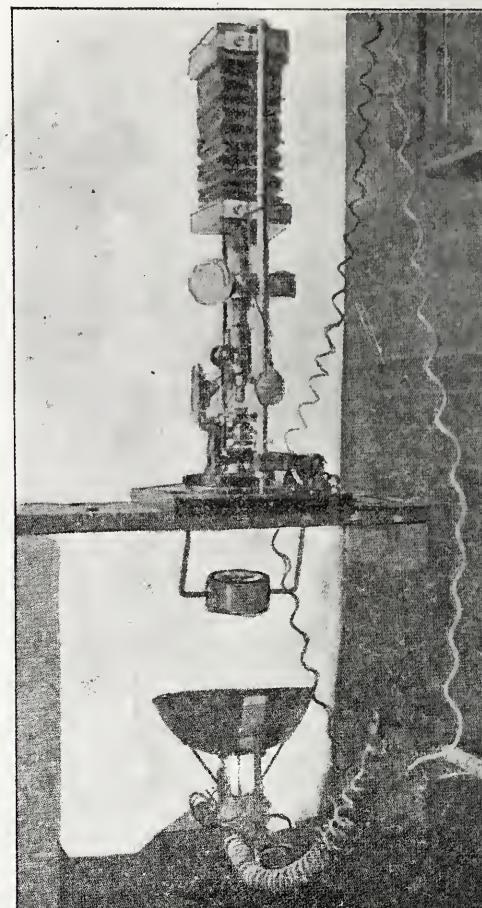
as to how he got his effects, and, as Spiritualism was then very much talked about, it used to be said that the ghosts had something to do with spirit media."

A NEW APPARATUS FOR INSTANTANEOUS PHOTO-MICROGRAPHY.

THE subject of photo-micrography is alike important to both biological and physical science. It involves not only accurate and interesting work with microscopic organisms, but from the physical, which includes the photographic side, much care is required in the selection and manipulation of the proper microscopic lenses, in connexion with the source of light employed, stain used upon the subject to be photographed, if a mounted slide, and the chemistry necessarily connected with the handling of the photographic plate itself, in order to obtain the best results, says Prof. A. C. Scott, in *The Scientific American*.

The different general methods employed in this work, together with proper magnification for certain forms, kind of illuminant, with ray filters, exposure, and character of plate, require separate treatment, as the chief object of this article is to describe a new apparatus for making instantaneous photographs of living microscopic animals.

After having worked upon photo-micrography for some time for the



Apparatus for Instantaneous Photo-micrography.

purpose of obtaining photographs of microscopic slides for illustration with the optical lantern, and having determined the conditions requisite to the production of good results with mounted slides, the thought occurred to the writer that, if an instantaneous photograph of a living organism could be made, it might be valuable to the biologist and instructive to the physicist.

It will at once be apparent to those who have worked along this line, that a powerful light is necessary for instantaneous work; in my own work with the apparatus an arc light consuming 2200 watts is employed, which gives, in the position used, about 4000 c. p. This light, as will be seen from the picture of the apparatus entire, is placed at a distance a little greater than the focal length of a condensing lens, so that the intensity of light upon the object and objective is considerably greater than would be the case without the lens. Of course a different position of the lens and light would magnify the intensity of the light greatly, but that is undesirable beyond a certain limit, as the heat would be detrimental to the microscope objective.

With the proper arrangement of the light the essential feature in making instantaneous photographs is the combination shutter and

view tube, which is made to be clamped by means of three thumbscrews to the draw tube of the microscope. This apparatus is fastened on after the ocular has been inserted in the draw tube. The mechanism of the apparatus is as follows:—

Upon a movable brass plate inside a light-tight box (shown in fig. 1, just below the camera bellows) is a 90° prism, mounted in such a way that all of the light which passes through the microscope is projected upon a piece of ground glass at the end of a cone, which may be lengthened or shortened in order to give correct focus to the object here, when it is properly focussed upon the ground glass of the camera directly above the microscope. Next to the prism is a hole in the brass plate for allowing light to pass from the microscope directly to the photographic plate, when the prism is moved by means of a spring and pneumatic release, and finally a sufficient amount of the solid brass left to cover the opening when exposure has been made.

To take a photograph, the microscopic animal is placed in a drop of water upon a suitable glass plate, the light is turned on, and the shutter so set that the object may be focussed upon the ground glass of the cone. The plate-holder is inserted and the dark slide drawn, leaving the plate exposed inside the camera bellows. The movements of the animal are easily seen upon the ground glass, and, when the desired position is obtained, the shutter is released, the prism moves out of the way, and the light passes to the plate. Cramer's isochromatic plates have given the best satisfaction with this instantaneous work. Although the apparatus is not perfected to the writer's complete satisfaction, exposures as short as one-fortieth of a second have been very satisfactory. Neither of the negatives whose prints are shown with this article had more than one-thirty-fifth of a second exposure. It seems perfectly possible, with good microscope objectives and the best arrangement of illuminant, to obtain thoroughly satisfactory negatives in one-hundredth of a second.

The apparatus may be of some value other than photographic to biologists from the fact that it allows one to study the movements of a living microscopic organism with both eyes with perfect ease, instead of by the common one-eye method, which is apt to be tiresome.

THE JOLY, WOOD, AND LIPPMANN PROCESSES FOR PRODUCING PHOTOGRAPHS IN COLOUR.

[*Transactions of the Edinburgh Photographic Society*]

It has long been the ambition of photographers to produce pictures that will bear towards their subjects the same relation as regards colour that ordinary photographs do in respect to form, and they have spent endless labour in their efforts. Whether the goal towards which their energies are directed is, from an artistic standpoint, likely or desirable to be attained is not a question to be discussed here; but that such a process, if perfected, would, at all events, be useful as a record of things as they were, is self-evident. The results hitherto, in spite of the ingenuity that has been exercised, are only partially successful, and are probably not final, though they may represent finality along the lines on which they have been produced. It is not, however, to the artistic or utilitarian aspect of the case, but to the physical theories on which the processes are based, and upon which only it is possible to work with success, that I wish to draw your attention to-night. As exemplifying the main lines of attack, I have selected three processes, viz., the Joly process, depending on the three-colour theory of vision, and requiring the selection of properly tinted filters and screens; the Wood process, also depending on the three-colour theory, but in which the final picture owes its colour to the diffraction of white light, and not to pigments or dyes; and, lastly, the Lippmann process, in which no act of selection or pigment is required, but where the colours are impressed by themselves according to a process of interference.

Light is believed to be a wavelike disturbance of the all-pervading ether, the waves spreading in all directions from luminous bodies being excessively small and of various lengths. When these waves fall on the retina of the eye, they cause a sensation which we call colour, the different lengths of waves producing different colours. The sensation of white light is, as shown by prismatic decomposition, ordinarily produced by the action of light waves of all the lengths, or, in other words, by a mixture of the different colours roughly called red, yellow, green, blue, and violet.

It has long been known that it is possible to produce to the eye the effect of all colours without having recourse to light of all the wave-lengths, but by using appropriate mixtures of light of three wave-lengths only—a red, a green, and a blue-violet. For example, an excellent yellow that contains no yellow rays results from mixing the red and green, whilst white light is produced by mixing all three. Further, if black is added to the three colours, i.e., if the light is more or less dulled, any shade or tint of colour can be produced, e.g., emerald green can be produced from sixty-three per cent. green, fourteen and a half per cent. blue-violet, and twenty-two and a half per cent. black, whilst peacock-blue is four and a half per cent. green, eight and a half per cent. blue-violet, and eighty-seven per cent. black, and so on.

Working on this theory, Clerk-Maxwell invented the three-colour pro-

cess of photography, which he described and exhibited in 1861. His method, which has been elaborated by Ives, is as follows: Three negatives are taken, each through one of the appropriately coloured screens, and give a record of the rays of those colours that can pass through the screens. Thus one screen allows those rays to pass that will afterwards be expressed as red; another, those that will be represented by blue-violet; and a third, those that will appear as green. Taking the plate exposed under the red screen, those rays that pass cause a blackening on development at the places where they fall on it, and similarly with the other two plates. When the positives are made from these negatives, more or less clear spaces are left wherever the original coloured rays struck, so that, if lights of the right colours are passed through each of the positives and then combined, they will produce the tints and shades of the original, if the screens are well chosen and the plates duly sensitive to the different colours.

It should be noticed, in passing, that the "taking screens" or colour filters through which the negatives are taken must be of somewhat different tint to the screens giving the colours to the positives which are combined to form the finished picture, on account of the fact that, whilst all the spectrum rays assist in producing the colours of the object, their effect is to be reproduced by the combination of three only. Thus, the red and green-taking screens must each pass some spectrum yellow, or light of this wave-length will not be represented, as in the finished photograph it is formed by the combination of a pure red and green. Again, the red light has a slight effect in producing a sensation of green, and so must be represented in the "green negative" to some extent.

Unfortunately, Clerk-Maxwell had neither the photographic nor the colour facilities available now, or the production of photographs in colour would have been in almost as forward a state forty years ago as it is to-day, for, in spite of the ingenious apparatus of Ives for making the three negatives and combining their effects, the process is difficult to carry out and the apparatus cumbrous and expensive.

Joly, who works on identically the same theory, seeks to avoid these difficulties by taking only one negative, which is exposed in an ordinary camera, but behind a screen composed of the red, green, and blue-violet, in stripes about $\frac{1}{30}$ of an inch wide, thus producing a record of the light passing through the different colours in similar stripes. The positive from this negative, when seen through a viewing screen similarly ruled in red, green, and blue-violet, gives the coloured picture. Thus, in the photograph of a red object, the negative is black at the red lines, and clear at the blue and green, whilst the reverse is the case in the positive, which, being clear opposite the red lines, and nowhere else, transmits red light from the viewing screen only.

Again, with a colour that is reproduced by combination, such as yellow, the lines in the positive that will be opposite green and red will both be clear, and so red and green stripes are transmitted, which, being so narrow and close together, blend and appear as yellow, and not as red and green. Dull colours are reproduced by the particular lines on the positive being only partially clear, whilst for white all the lines are unobstructed, and the result, which from the loss of light, though not pure white, is at all events a delicate grey.

An almost identical process has been brought forward by M'Donough in the United States, which presents some improvements. The ruling is finer (300 or 450 lines to the inch), and mechanically more perfect, whilst the light filter, which is necessary to aid the isochromatism of the plates in all these processes, is made so as to be variable with the quality of the light. The colours in the lines in M'Donough's screens are paler than in Joly's, which to a certain extent reduces the loss of light inherent in these processes, but probably at the expense of richness of colour. The loss of light, which can be obviated in transparencies by brilliancy of illumination, is very marked in the application of this process by M'Donough to printing coloured photographs, where a process block of the positive is superimposed on a screen printed on the paper; but, owing to the imperfect transparency and purity of the pigments, white and the high lights are represented by rather dull colours.

In order to get over the difficulties arising from using coloured viewing screens, i.e., their costliness, cumbrousness, and liability to fade, Professor R. W. Wood, of Wisconsin University, makes use of the phenomenon of diffraction to produce the colours in the positive, though his process still requires colour filters, as in the Ives process, to make the negatives.

It is necessary, in order to understand how colours are produced by diffraction, to refer to the theory that the difference between different coloured lights lies in the lengths of the waves of which they consist. Now, if a coloured light, say red, passes through a very narrow slit and falls on a screen, that which meets the spot directly opposite the slit will appear as a red band, as the waves from both sides of the slit arrive at the same time and in the same phase, but with light that falls obliquely on the screen it is different, as the light from one side of the slit has farther to travel. If the extra distance is half a wave-length farther on one side of the slit than on the other, the crests of one series of waves arrive at the same time as the troughs of the other set, when they neutralise each other, and darkness results. Still farther to one side, when the extra distance becomes a whole wave-length, the waves get into step again, another band of red light is formed, and so on. With blue and green rays the same thing happens, but nearer the central band, as

their waves are shorter, so that, if white light is used, the red will appear at one place, the green at another, the blue at a third, and so on, so that a spectrum is formed. If, therefore, you look at such a slit from one point, it will appear red; if from another, blue; and of other colours according to position.

Now, the narrower the slit, the farther to one side must the rays be diverted in order to get half a wave-length out; so, by having slits of appropriate width, it is possible to have red, blue, or green light directed to the same point. Instead of single slits it is better to use a grating of many slits side by side, when the same thing happens, but more light is transmitted and the colours are more brilliant.

Wood's process depends on this. He takes three gratings, one of which, with 2000 lines to the inch, when looked at from a certain point, appears red; whilst another, with 2400 lines, appears green; and a third, with 2750, appears blue. He exposes a plate coated with bichromated gelatine under the 2000 grating and a "red" positive obtained as in the Ives process, and then under the "green" positive and the 2400 grating, and finally under the "blue" positive and the 2750 grating. The gelatine is then washed in warm water, and appears as brilliant gratings of 2000 lines to the inch in the red parts of the picture, of 2400 in the green, and 2750 in the blue, whilst, in the colours that are produced by mixture such as yellow, two or more gratings are superimposed.

If this plate is looked at from the appropriate position, the picture appears in its natural colours, red where the grating is 2000 lines to the inch, and so on. At the places where the gratings are superimposed, the effects seem to vary; sometimes they act as required—e.g., for a yellow part produce red and green, which blend and appear as yellow; but occasionally this is not the case, probably on account of a grating of 2000+2400 lines being formed which would not transmit yellow to the point of view.

The photographs can be reproduced by simple contact printing on bichromated gelatine plates, each of the copies being a positive, as also are their reproductions, and require no added "viewing screen" in order to see the colours. Though not strictly producing colour photographs, Wood's process is half way on the road to it, especially as it is theoretically possible to produce the positives directly in the camera by exposing a plate successively behind red, green, and blue colour filters, if these are ruled with the appropriate gratings.

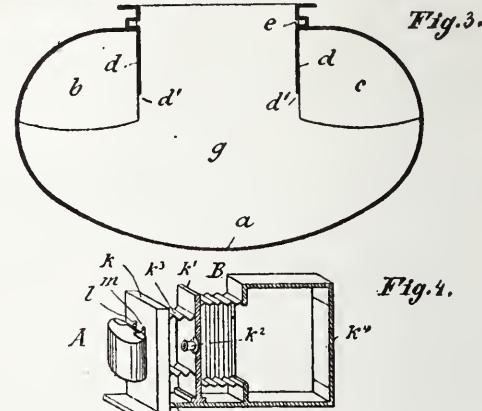
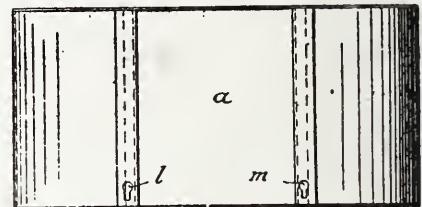
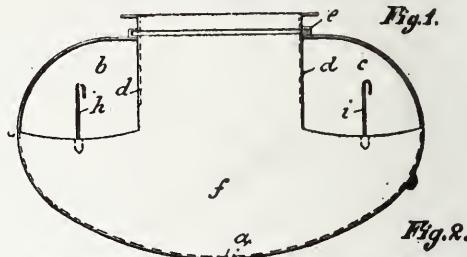
Wood's process is thus an advance in some respects on the processes based on that of Clerk-Maxwell; yet it still requires the selection of appropriate colour filters and gratings.

Lippmann, however, avoids such trammelling complexities, and, though his process is extraordinarily difficult to carry out, yet the results are genuine colour photographs produced by the action of light alone without any mechanical assistance whatever. The method on which he works depends on the following considerations: If light waves are made to return exactly on the course by which they come by reflection from a plane surface, the advancing waves blend with the returning waves, and produce a disturbance which resembles an ordinary wave in rising and falling, but differs in that it does not advance. Now, if these "stationary" waves of a particular coloured light are formed in a photographic film which, as a rule, is thick enough to hold about one hundred of them, they affect the sensitive material mainly at their crests, and so, on development, a series of blackened layers are obtained in a sort of ladder-like formation. Finally, on supplying a film with this structure with white light, only those rays that fit in as regards wave-length with the distance between the deposits will continue to exist, all others sooner or later "getting out of step" and being extinguished, so the original colour is reproduced. The same sort of thing will result with rays of other colours, the only difference being the distance between the steps of the ladders, and, though it is rather difficult to form a mental picture of the complex state of affairs when a mixture of coloured rays falls on the plate, yet experiment shows that order, and not confusion, results. Thus, if a plate with a transparent film is exposed in a camera with its glass side towards the lens and with its film backed with a mirror of mercury, a photograph is produced that shows the object in its natural colours. Such a photograph cannot be reproduced by printing, as might be expected from a consideration of the theory, and can only be seen in colour by reflected light. However imperfect the result, however difficult the process, the fact remains that such a photograph reproduces the colours of nature without having recourse to pigment, and shares, with the other processes I have mentioned, the proud position of being elaborated by following the one sound line of research on which success can be expected or deserved—I mean, by working on and developing the consequences of theory.

J. TUDOR CUNDALL, B.Sc.

ployed for thin negatives, in order to properly subdue the reflected light. The cover, *f*, and the bottom, *g*, of the apparatus leave openings to the light chambers, *b* and *c*, free (see fig. 1), and the neck only extends partially into the apparatus, that is to say, as far as *d*¹, *d*² (fig. 3), in order to allow as many light rays as possible to fall upon the mirror without passing directly into the said neck.

Any strong light can be employed in the light chambers, *b* and *c*, as the sources of light. Where electric light is not available, I advantageously employ magnesium light. For suspending the bands I pro-



vide suitable hooks, or the like, in the chambers, such as *h*, *i*, shown in fig. 1.

To connect the illuminating apparatus to the negative carrier, *k* (fig. 4), of the camera, the former can be furnished with two eyes, or the like, *l* and *m*.

The apparatus is employed as follows: that is to say, assuming that the negative carrier, *k*, the lens-holder, *k*¹, and the lens, *k*², are fitted in position, and the bellows, *k*³, secured to the lens-carrier, *k*¹, the negative (with the film side turned to the lens) which is to be enlarged is pushed under the springs of the negative-carrier, *k*; the illuminating apparatus, *A*, is suspended by means of the two eyes, *l*, *m*, to the hooks provided on the negative-carrier, *k*, and the apparatus is then ready for use. After the necessary magnesium bands or strips have been suspended in the hooks, *h* and *i*, in the illuminating chambers, *b* and *c*, and the silver bromide paper to be employed arranged in the back, *k*⁴, of the camera, the two magnesium bands are ignited from below, the rays of light proceeding from the light chambers, *b* and *c*, striking against the reflector, and being reflected evenly upon the negative, so that a regularly illuminated picture is obtained.

In the Photographic Section of the Bath Century Exhibition, now open, the highest award, the gold medal and diploma, has been won by Mr. Graystone Bird, of 38 Milsom-street, Bath, who also received a symmetrica anastigmat lens given by Ross, Ltd., of London.

MESSRS. NEWTON & Co. ask us to note that they have some very fine Scripture slides for the Easter services. The newer series of slides are a set of fourteen "Stations of the Cross," from some finely executed examples of wood-carving. The figures are cut in very bold relief, and stand out almost stereoscopically on the screen. They have also a large number of Scripture slides for Lenten services, which at this time of year are used in many of the churches to illustrate services of sacred song. They have also eighty-eight slides from the well-known pictures of the Passion by J. J. Tissot, as well as 150 from pictures by other famous artists.

ENLARGING CAMERAS.

[Patent No. 6588 of 1890.]

THE invention of Herr Stalinski, of Baden, who says:—

The illuminating apparatus, *A*, is made of a curved, or somewhat reniform, shape, the inside of the front, *a*, of which forms a reflector. At the back and laterally there are provided light chambers, *b*, *c*, whilst in the middle there is a flat neck, *d*, having an internal groove or fold, *e*, which serves for the insertion of a disc when the apparatus is to be em-

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THE LANTERN RECORD.

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LANTERN MEMS.

PHOTOGRAPHIC lantern slides have played an important part in educational development during the last thirty years, and one of the workers deserving of the utmost credit for the thorough manner in which the subject has been tackled is Mr. F. York, who, with his recent years, has produced hundreds of sets of slides on geography, history, physiology, microscopy, and the sciences of air, light, and heat, while history and entertaining subjects have been overlooked. The figures represented by the output are so lifelike that I think they will be of interest to lanternists.

In the space of twenty-seven years the number of slides produced reached a total of 2,103,555, and the glass used for them, if laid end on end, would reach 215 miles, or about the same distance as London to Plymouth. The weight of this glass would be 4 tons, and, if carried by rail, would require 13 trucks with a carrying capacity of 8 tons each. Placed one on top of each other, a column would be formed 4 miles high, or 21,120 feet. This height can better be understood when it is stated that Mont Blanc is 15,220 feet, or 3 miles high.

The secret of this firm's success is due, after the comprehensive nature of the selection and arrangement of the photographic production, to the lectures or readings published to accompany the sets of slides, for not only do they save the time of those giving lectures and entertainments, but provide useful information in a readable, and, speak, palatable, form that assists the amateur photographer. He has gone over similar ground and taken snap-shots or photographs of the places visited. They thus form the foundation for a lecture in which personal experiences are introduced.

OTHER old and earnest worker in the lantern-slide world is H. N. King, who for as many years as I can remember has produced photographic prints and transparencies of the Royal Palaces and old English homes, and was honoured a few years ago by being granted the royal warrant of appointment as photographer to Majesty the Queen, having worked for Her Majesty for over 20 years. Recently I have had the pleasure of inspecting some stereoscopic transparencies, and very beautiful they are. There are thousands of people at the present time who have never seen

through a stereoscope at all, and tens of thousands who have not had the advantage of viewing a glass stereograph through a stereoscope. There must be quite a fair percentage of the rising generation who would like to possess some of these beautiful and realistic records of historical buildings, cathedrals, and palaces and artistic works contained in the latter that can only be seen on rare occasions.

Mr. HORATIO NELSON KING has had privileges that few others have ever had, and the consequence is that he has been able to photograph rooms in palaces and show places to which the public never have admission, so that those who purchase photographs from Mr. King's negatives get something unique as well as artistic. The stereoscope and stereoscopic slides if properly pushed should be popular again; any way, I know of nothing that gives so much enjoyment to a party of friends as a nice selection of stereoscopic slides, and at a *soirée* one of the most popular exhibits is a revolving stereoscope with 50 glass stereographs inside *properly* lighted by a good lamp placed behind the ground glass. The oh! of the firework night at the Crystal Palace is reproduced with the addition of "how beautiful!" "how real!" and "how splendidly everything stands out."

MR. KING and his son have taken up in recent years the ever-popular subject of the "Soldiers of the Queen," and have a number of very good examples of the cavalry and infantry of the Household Brigade, and many typical slides of military life, some showing "Tommy" at work, and others at play, while a good one represents a Lifeguardsman, in full home service regiments, shaking hands with a comrade in khaki "ordered south." The demand for generals and soldiers who have become famous or popular during the present war is still considerable, and will be until the much-desired ending comes by the occupation of Pretoria. Next season should also be a good one for lantern-slide dealers, as the officers and war correspondents and others that are at the front will want to give their friends illustrated lectures of their doings and experiences. Such, however, was the case after the Egyptian and Soudan wars, and no doubt it will be with the Boer War.

THERE has been nothing very new in the lantern world this season, and all invention seems to be stopped, as far as ordinary apparatus is concerned, the optical lantern and dissolving-view apparatus being eclipsed by the cinematograph and apparatus for showing animated photography. It is not to be wondered at, when one sees representations of scenes from the war and popular events portrayed by the biograph and other good apparatus, and the reception given to them by the audience. At a recent visit to one of the halls of variety at the West-end, the only word that could express the applause that followed the exhibition of the pictures was "enthusiastic."

FOR educational work at colleges and schools the lantern is largely used, and now and then the projection microscope and polariscope, but I should like to see these two latter adjuncts of the lantern more popular among amateurs, for nothing could be more wonderful than the microscopic beauty of all nature, whether insect life, botany, or biology, and the best way for the audience to see this is with the projection microscope, or, failing that, by photographic transparencies taken from the actual object by means of the microscope.

G. R. BAKER.

LIMELIGHT MATTERS.

MODERN JETS.

DURING the last ten years many improvements have been effected in the construction of limelight jets, and, although it can scarcely be said that any change of principle governing the manner in which the gases are burned, or the heat from the blow-pipe generated, has been introduced in the modern forms of jets, still it may fairly be said that almost a revolution in their form and construction has been introduced. No doubt these changes are attributable, first, to the universal employment of high-pressure gas cylinders; and, secondly, to the adoption some years ago of "saturators" in lieu of hydrogen or coal gas; and, although the life of the saturator has been a short one (for but few even of our best limelight operators are now found using them), still there is no doubt their introduction, to a certain extent at least, had much to do with the radical changes introduced into some of the forms of our more modern jets.

When the convenience attending the use of the earlier form of saturators began to be appreciated, there soon followed numerous experiments in regard to the best form of jets to use in conjunction with them, and it was soon apparent that there was room for improvement by reason of the different densities of the two gases, a more complete system of mixing the two gases being necessary where a saturator was employed than would be the case where coal gas or hydrogen was being utilised. This soon led to the manufacture of jets having much larger chambers, and in one particular form of jet an entirely different form of chamber was introduced, a design—to a certain extent, no doubt—found necessary to enable these large mixing chambers being used in ordinary lantern shells.

It is well known that with all mixing jets it is essential to employ a larger mixing chamber if it is desired to employ a really large bore; for, if an increase of light is desired, it can only be obtained by increasing the heat from the blow-pipe upon the lime, and this increase in heat in turn can only be attained by burning more gas. In the earlier forms of mixing jets the size of the mixing chambers was seldom larger than a half-inch in diameter, and the bore of the nipples used in conjunction therewith somewhere about the one-twenty-fifth of an inch, and during the days of gas bags, where pressure may be said to have been limited as well as constantly varying during an exhibition, these old-fashioned jets were considered to be working very well when they were yielding a light of from 350 to 450 candle power. Experimenters soon grasped the fact that, if large bores in the nipples were to be employed, not only must the mixing chambers be increased in size, but their form required special consideration also, so that a fairly continuous and uninterrupted flow of gas was allowed to pass to the orifice of the jet; this led to the abandonment of the earlier form of box chamber with small circular cavity for the larger, round, and upright form of chambers in which all square corners were rounded off, and by means of which a more silent light was procured even when a considerable increase of gas was put through the jet. The outcome of these experiments was soon seen in the round upright chambers which have been employed up till the present time. In the passing of more gas through a jet, of course there must be a corresponding increase of pressure, and in many of these what may be termed improved forms of jets with an increase of pressure beyond, say, twelve inches, as was the case in the days of gas bags with such jets, they were very prone to become "roarers." This defect in even the best jets soon led up to what is termed the packing of a mixing chamber, whereby the two gases were mixed in the most perfect manner. Of the numerous devices employed for a thorough mixture of the gas before the same is emitted from the nipple of a jet, perhaps none have ever surpassed, if indeed equalled, that devised by Mr. Lancaster, and which is still largely employed, even in the best of our most modern jets.

Mr. Lancaster's method consists in employing a large number of alternate rings and perforated metal discs and circular pieces of gauze; these occupy the entire space of the mixing chamber, and, if ordinary care be

bestowed upon the form and finish of the nipple, a silent light is assured and this packing enables, in fact requires, a considerable increase of gas pressure to employ such jets to their full advantage. In the days of gas bags it was sometimes difficult to obtain this pressure, but with the introduction of the compressed cylinder with its unlimited pressure there is no doubt that the form of packing employed in a jet is a matter of first importance, provided those jets are to be made to yield their ultimate power without becoming noisy. The difficulty of roaring or hissing in limelight jets may be said to have been entirely overcome in the form of our more modern jets, and, whenever this is found in a really high-class jet of quite recent construction, it can nearly always be traced to some defect in the nipple or its orifice. I can well remember having my attention drawn to a particular jet that was made by one of the very makers of the day. This jet had worked well for a time, but, owing to some carelessness on the part of an inexperienced operator, the original nipple was ruined, and a new one, on being substituted, proved a roaring indeed. On close examination the new nipple showed no signs of being in any way deficient, yet it would not, under a good pressure, yield a silent light. A closer examination revealed the fact, however, that a friend had been tampering with the thread of the screw inside the nipple; this had been increased. The thread for the screw of the connecting pipe reached down the pipe only about three-eighths of an inch, the thread of the nipple inside extended to three-quarters of an inch, so, when the nipple was screwed home on the connecting pipe, there was a distance of three-eighths of an inch of clean-cut corrugation, that had crept and churned up what ought to have been a perfectly smooth bore of gas. Of course, the jet was blamed, and the maker also, while at the time the fault lay entirely with the user himself. On the nipple being adjusted so that there was no roughness inside to intercept the flow of gas from the mixing chamber, the light quieted down nicely under the full pressure. In mentioning this circumstance it will be shown what a very little suffices to upset the even balance of a good jet; the nipple in question is one and a half inches in length, and, since the defect has been made good, I have obtained easily a light equal to fifty hundred candles with it. With a much shorter form of nipple the same defect is also liable to occur, and, in every case where a well-made jet is prone to be noisy, it should be examined at this point, and, if the connecting pipe does not deliver the gas up and beyond the screw thread inside the nipple, it should be made to do so.

It has been pointed out that, if increased light is desired, more gas must be burned.

This brings into consideration the most useful size of aperture to employ in a nipple. Speaking generally, all high-power modern jets bear much wider apertures than is really required for ordinary lecture projection. These jets are, no doubt, designed for cinematographic work, and hence are required to yield a very great amount of heat upon the lime, so as to produce the utmost amount of incandescence where somewhat dense films are being projected on the screen; hence the bore of what may be termed a powerful jet will range from the fifteenth to the eighteenth part of an inch, and in some other forms even wider apertures are used. Competent operators, however, generally shirk a large bore and rather coax a jet with a somewhat smaller aperture, by reason of the increased comfort a smaller aperture will yield in all-round work. The heat that is generated when even a fifteenth of an inch bore is employed is very great indeed, in fact, often uncomfortably so, and such large bores cannot be practically employed in the small shells so much in vogue in lanterns a few years ago; in fact, most of the modern form of jets cannot be used in these shells at all. The increase in size of the mixing chamber, and in some forms of the newer jets the length of the pipe from the chamber to the nipple, preclude those jets being used in any but specially suited lanterns. In the one case this means that the length of pipe does not permit the jet being placed in conjugate with the short-focus condensers generally fitted to those lanterns; in the other, the height of the nipple will not permit of the light being centered through the condenser.

In ordinary lanterns it will be found the centre of the condenser is about four and a half inches from the floor of the shell, and nearly all the high-power jets (with perhaps one single exception) are so constructed that the nipple is much higher than that distance. This fact ought to be borne in mind by any one who contemplates using a new jet of the class in an old form of lantern. I have known a serious breakdown from this cause alone when a trial had not been made beforehand.

The heat generated by a high-power jet is very different from that given off by the older patterns, and larger shells in the lanterns, as well as longer-focus condensers, must be provided if they are to be used with any degree of satisfaction.

Of course, nipples of different sizes can at all times be kept at hand, so that to a slight extent will these smaller-sized nipples alter the size of the jet inside the lantern. A very useful aperture to have is a bore of about the twentieth of an inch. This yields, with a closed chamber, a light of great intensity, and where a short supply happens to be, or where only a moderately small disc is required, a nipple with a bore of the one twenty-fifth of an inch, or even less, will prove a friend in need. All jets ought to be so finished as to permit of the nipples being easily screwed off and on without loss of gas at their junctions, even when red lead is not used.

A very noticeable factor in modern jets is the increase in their weight, and it seems as if there is really no need for the great weight that is now employed in their construction. This increase in weight has brought about an increase in size of the pin as well as the heads of attachment, and in one form of jet the maker has hit upon a happy idea of making the upright attachments movable. By this means the jet can be beautifully balanced on its upright pin at any angle, according to the length of the body of the lantern, or can be turned altogether if it be desired. Another manufacturer makes a feature of having his jet supported in the centre only at a fixed point.

In all cases rigidity is well provided, either by the improved upright pin or by the entire absence of it in some of our jets.

In providing for a silent light, manufacturers are now enabled to apply a much greater resistance to the flow of gases than was formerly possible, and the packing of different chambers varies considerably. In former times, when a pressure of, say, nine to twelve inches was common, the chambers were either but slightly packed or contained no gauze at all. Now, with fine adjustment taps, which permit of the full pressure of the cylinder, if desired, being utilised, or, as in the case of regulators, a common pressure of two and a half pounds, all kinds of material are employed to pack the chambers. These in some cases embrace stone and asbestos; in others, small shot and such components, two and a half pounds pressure on the regulators being a safe working limit with most of the modern forms of jets. With a new form of jet, however, if regulators are to be used, they must be specially weighted to about fifteen pounds pressure, and, of course, a corresponding increase in the strength of the rubber tubing employed is required. Under proper conditions these new jets give a fine light, however.

Along the newer form of jets there falls to be noted those fitted with nipples on one mixing chamber, and much ingenuity has been displayed to bring this double jet to its present state of perfection. Some other, it has never been largely employed, but, where the nipples are in pitch and aperture, a very powerful light is obtained.

It seems strange that during recent years almost all the improvements have been worked on the mixing form, for but little, if any, attention has been bestowed upon the blow-through jet, which stands as it did years ago, this being a strong proof of the superiority of the mixing type. Nowadays there is, happily, no talk of danger with these jets, it being impossible, with the back pressure of cylinders, for an explosion to take place of any moment, even when it is purposely created with rubber tubing between the cylinder and jet.

All forms of modern jets a reliable cut-off movement is provided, the older form of taps has given place to a fine adjustment movement. These alone form improvements of great value, and it is only those who have worked with both methods that are enabled to appreciate the advantages of the modern tap. True, these fine adjustments can be applied to any of the older patterns, and their old wing taps utilised as cut-off movements, in which case the improvement upon an old jet is great indeed; but a perfect cut-off attachment should work both at the same movement, which is not possible when old jets are fitted with new taps.

A really good, high-class jet supplied with varying sizes of nipples is a boon to a lanternist, and, when care is taken that every joint and fitting is gas-tight, it confers a degree of pleasure to work with them known years ago.

T. N. ARMSTRONG.

THE CINEORAMA AT THE PARIS EXHIBITION.

We are indebted to the Paris correspondent of the *Daily Telegraph* for a description of the Cineorama, which is intended, when finished, to be one of the great attractions of the Paris Exposition. It is to be a moving picture, but not one of the ordinary kind. The appearance of motion is given to the scenes environing the spectator, not by the primitive

method of a revolving series of ordinary panoramic pictures, but by an ingenious application of the biograph to panoramic views. The experimental operation, which half Paris seemed to have gathered together recently to watch at the Tuilleries, consisted of the ascent of a balloon fitted with cinematograph cameras. The views obtained will constitute one of the shows at the cineorama. It must be explained that the object of the latter undertaking is to provide spectators installed in a car, but seated on *terra firma* in a building near the Eiffel Tower, with all the sensations of a balloon voyage in various parts of the world. Travellers, on getting into the car, and on the word "Go!" being given, will, to all intents and purposes, slowly rise from the earth, leaving the crowd standing round the balloon behind them. Hats will be waved, handkerchiefs fluttered, and the throng of onlookers will slowly disappear from view. The horizon will widen, and the earth be hollowed out into a gigantic basin, in which all the variety of scenes which the globe provides will be unfolded to the sight. There will appear the ocean crossed by unceasing lines of steamers, and the desert, traversed by winding caravans or furiously galloping hordes of Tauaregs; army manœuvres in full action on the plains of Eastern France, the mad gaiety of carnival crowds in Italian cities, quieter scenes in the ancient towns of Flanders, more furious animation in the bull fights of Spain—such are a few of the bird's-eye views promised at the cineorama. All these views will be in motion; the ocean will be no painted sea, the crowds in the cities will be alive, and, of every scene which he visits, the traveller will feel that he is a part.

All these wonders will be worked by a combination of the panorama and biograph. The views used for the latter will be photographs taken in a real balloon ascent, by means, of course, of special cinematograph cameras. These views, which will thus give the succession of scenes visible to a spectator rising in the air, will be projected upon a circular, or, more accurately, a decagon-shaped sheet, surrounding the imitation car in the centre of the theatre. The novelty of the show might so far be considered to consist only in the idea of taking cinematograph views, not merely of scenes in motion, but also from a moving point—an ascending balloon. But the realisation of this idea also offered various interesting problems, which can only be solved by great perfection in the instruments employed. To obtain cinematograph pictures, not of a scene viewed from a single standpoint, and unfolding itself, so to speak, past one spectator's line of vision, but of the entire horizon at once, as viewed by a number of spectators standing in a circle in an ascending balloon, it is, of course, necessary to use several photographic apparatus simultaneously focussed, so that their combined lenses exactly take in the complete circle. As may be imagined, great nicety in the disposal of these cameras on the balloon car, and of the machinery by which the films are revolved, is required for the experiment to succeed. A similar and equally great difficulty, moreover, is encountered in the projection of these pictures supposing them to have been successfully taken, on to the panorama sheet. The utmost exactness is necessary in the machinery revolving the slides simultaneously, it being quite understandable that the slightest relative inaccuracy in the revolutions of the various views would produce the direst results in the general picture. One spectator would find himself near to earth, while his next-door neighbour was soaring over mountain peaks; or, in the horizontal direction, two travellers side by side in the car might be journeying one over Madrid, with bull fights going on, and the other above peaceful Bruges, with the fish market in progress. The organizers of the cineorama, by expending the greatest care on the photographic and on the revolving machinery, hope to avoid anything which would probably produce among the visitors' balloon giddiness in a peculiarly acute and abnormal form. They have arranged the cameras for taking the photographs in a circle of ten. The pictures will be afterwards shown by ten revolving machines on each side respectively of the Decagonal Hall, the revolutions being at the rate of thirty-five to forty thousand a minute. Thus each of the ten planes of the decagon severally will be a biograph show of the usual kind, the originality of the cineorama being the idea of combining these ten sets of views together to form the circular horizon, and the difficulty of the enterprise lying in the need for absolute synchronism of the ten revolving machines.

Balloon journeys in various parts of the globe are promised in the programme of the cineorama. Last week's experiment, however, was of course confined to the taking of photographs of Paris and the Exhibition, which will, it is stated, be the scene of one of the cineorama journeys. The balloon, a very large machine, was announced to rise from the Tuilleries at two the following day, but by that hour the silk covering had only just been filled with gas, the latter being of the ordinary lighting kind. While operations were in progress, opportunity was afforded to

scrutinise the car. On the top of this were mounted the ten cameras, placed in a circle. The name on the apparatus, Raoul Grimois Sanson, is that of the inventor of the cineorama, the balloon being managed in the ascent by the Count de la Vaulx and M. Mallet, two well-known aeronauts. After various incidents, rather of an alarming kind, as the machine showed a disposition to cast its moorings before its gear had been properly adjusted, the balloon, at a few minutes past five, amid the cheers of an enormous crowd, with which the Tuilleries terraces were densely packed, was let off, and rose swiftly, bearing at once to the south-east. Immediately on the word "Go!" the machinery revolving the camera films was set moving with a wild whirring sound, so that the first scene which visitors to the cineorama show will view on their balloon journey over Paris will be in the foreground the friends of the aeronauts and many members of the Aero and Automobile Clubs waving their hats and handkerchiefs, and on rising a little higher the surging crowds round the terraces, with the Place de la Concorde equally thronged, and the Exhibition beyond. What the subsequent scenes will be cannot, of course, yet be ascertained. The balloonists intend, if possible, to cross over the entire Exhibition premises to the Champ de Mars and the Trocadero, so as to obtain views of the whole World's Fair, but, owing to the direction of the wind, it is rather doubtful whether they will be able to carry out this programme entirely. Another difficulty which must have stood in the way of the photographer was the waning light, owing to the late hour of departure. One of the organizers, impatient at the delay, jocosely suggested taking a magnesium light apparatus. Fortunately, however, the afternoon was cloudless and particularly bright, and this will probably have enabled the photographer to get in a good half-hour's work in sufficient daylight.

STEREOSCOPY AT THE SEAT OF WAR.

MR. H. F. MACKERN, stereoscopic photographer for Messrs. Underwood & Underwood, writing on the subject of binocular photography at the seat of war, says that, firstly, without the most exceptional credentials it is absolutely impossible to obtain the many permits necessary to get to the scenes of action, and, even with both of these, every step has to be taken with tact and diplomacy.

Secondly, the natural conditions are such as to almost discourage the greatest enthusiast. A sun that burns as though through a magnifying glass, dust that compels one to wear glasses most of the time, and a hot wind sweeping over the bleak kopjes and barren Karroo, blistering the face and cracking the lips, make life almost unbearable.

Lastly, but by no means least, the expense attached to an undertaking of this kind is enough to appal the most enterprising, but his firm have not allowed this to hinder them. Consequently, if the fates should favour his own personal efforts, Messrs. Underwood & Underwood will be able to place before the public a collection of views of the British-Boer War second to none of the best illustrated papers.

Some two hundred negatives of scenes about Capetown—disembarking, entraining of troops, &c., are already in the hands of Messrs. Underwood & Underwood, and some four hundred more are now on the way; these latter are all from the front so far as his field of operations has been conducted.

"I got as much as I desired at Modder River, and then came in for the best 'scoop' I have had yet. The prisoners, some 4700 taken by Lord Roberts, were to be marched into camp. I saw the General at Modder; he flatly refused to allow me or anybody to take photographs. This may have seemed very disappointing, especially as General Cronje, the Boer General, and party were coming in that day, and would depart from headquarters by train to Cape Town. I can't tell you all the details of how I got at it, but I made a negative of General Cronje and party leaving headquarters for the train, negatives of the 4700 marching in, on the road and in camp, and, lastly, a group of all the chief Boer commandants, and with the General's permission. I was glad to get the only stereographs made."

"Besides these most interesting subjects of General and Mrs. Cronje and their son, escorted by General Douglas to the train for Cape Town, the chief Boer commandants who acted under General Cronje, and Boer prisoners on the march from Paardeberg which will speak for themselves when you see them through the stereoscope, you will have in your set some of the most remarkable stereoscopic photographs ever made. These are the titles of only a few: The fearless Suffolks storming the kopje. Montmorency's scouts finding Boer position near Dordrecht. Worcesters skirmishing with Boers near Colesberg. The Gloucesters

charging a kopje and facing death. "The last drop"—a scene on battlefield at Dordrecht. A desperate stand at Modder River, where Methuen was defeated. British scouts firing on a Boer patrol. Zealand Hill defenders and distant hills held by the Worcester Slingersfontein."

THE JOLY PROCESS PRACTICALLY APPLIED.

BEFORE the Leeds Camera Club last week, Mr. C. B. Howdice, A.R.I.B., delivered an interesting lecture on "Some Experiments with the Joly Process of Colour Photography." After giving a short description of orthochromatic photography, and the necessity of employing colour sensitive plates and yellow screens to secure correct luminosity values, he exhibited a "colour chart," showing yellow, blue, green, and red regular gradation according to their luminosity values, and a negative upon an ordinary plate, without screen, of the same. From this it could easily be perceived how inaccurate was the monochromatic rendering of colour values thus made, but another negative, made upon an orthochromatic plate, through a suitable light filter, reproduced these colours in wonderfully correct gradation, according to their luminosity values.

He briefly described the principles of the Ives, Lippmann, Wood, and Sanger-Shepherd processes of colour photography, and stated that he selected that of Professor Joly on account of its comparative simplicity, one feature which strongly recommended itself to him being that the apparatus in the shape of cameras, slides, or lenses, are not necessary.

After explaining at some length the working details of the process, which our readers are already acquainted with, Mr. Howdice gave his own experience of the process, which contained many valuable hints, that should prove of considerable assistance to other workers in colour photography. Mr. Howdice's primary object in employing the Joly process was for the production of lantern slides in colours to illustrate his lecture on "Yorkshire Minsters" and other architectural subjects, but principally for the reproduction of stained-glass windows.

First, as regards plates. After trying almost every brand of colour sensitive plate, he now uses only Cadet's special rapid spectrum, registering about 120 on Hurter & Driffield's sensitometer. One important reason for keeping to one brand of plates is that the light filter or "interceptor," must be exactly suited to the particular plate used, correct colour-rendering cannot be secured. The makers recommend the ferrous-oxalate developer, but, personally, he prefers metol, which, in his hands, not only works quicker, but yields better results. On account of this, hydroquinone must be used, as it produces density in the blues very early in development, and accentuates them to the detriment of other colours.

Tinkering with the developer is utterly useless in colour photography, for, unless absolutely correct exposure be given, no modification of the developer will produce a negative that will yield a transparency giving correct colours. If any mistake has been made in the exposure, which, sometimes, is only revealed with certainty after a positive has been made from the developed negative, it is best to smash the latter once, that procedure being the quickest and cheapest in the end.

When developing "spectrum" plates, which are extremely sensitive to yellow and red, it is advisable to work at some distance from the red light and keep the dish covered, only exposing the plate for a moment to observe the course of development. With the plates named, Mr. Howdice considers sufficient density has been secured when the image is distinctly visible upon the glass side. The lecturer exhibited a number of failures, most of which were due to incorrect exposure, and explained that his method now was to expose for the yellows in the subject, these being the combination of the red and green; the latter, being the laggard, rendering the colour somewhat brown if a full exposure be not given.

Working through two colour screens the necessary exposure is a comparatively long one, one minute and upwards being required for outdoor subjects, and up to several hours for interiors. A sunset effect which Mr. Howdice projected on the screen had received two minutes with lens working at f-8; a view at Bishop Bickersteth's grave at Ripon had five minutes at f-8; another of the cathedral at Ripon, taken from the south-east, was given twenty-five minutes with f-16 at 5.30 in the morning in July. A portion of the reredos at Beverley at f-16 had ninety-three minutes' exposure, and a portion of the old glass in the east window of the same minster, taken with a tele-photo attachment (magnification six times) at f-16, received two and a half hours' exposure. Mr. Howdice also showed a large number of "easier" subjects, including flower and fruit studies, birds, botanical sections, shells, butterflies, portrait, china, coloured prints and drawings.

THE X RAYS IN PEACE AND WAR.

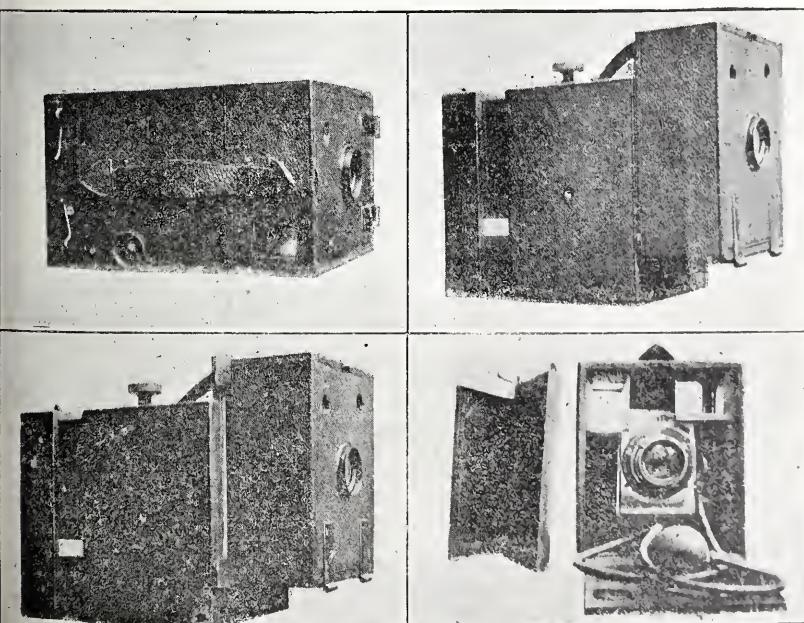
ON Tuesday evening, April 24, under the auspices of the Croydon Microscopical and Natural History Club, Dr. Chisholm Williams and Dr. F. S. Pepperdene delivered a lecture on the above-named subject. The remarkable developments which late years have seen in the adaptation of electricity to the requirements of practical surgery and the especial appropriateness of the subject to the present circumstances of the nation, with so many of its young men falling wounded on the battlefield, together made it a happy thought to promote such a lecture in Croydon, where interest in science and in the war is so keen. The proceeds of the lecture, moreover, were to be devoted to the X-ray department of the City Orthopaedic Hospital, in Hatton Garden, and the benevolent purpose of the promoters constituted another strong appeal. The platform was furnished in the centre with a large screen for the display of lantern slides, and one end of the platform had been fitted up as an electrical laboratory for the purpose of practical demonstrations.

Mr. W. Whitaker having, as Chairman, introduced Dr. Williams and Dr. Pepperdene to the audience, Dr. Williams proceeded to read an interesting paper, in the course of which he rapidly sketched the advance of electrical research from the time of Otto von Guericke, the distinguished German natural philosopher who, in the middle of the seventeenth century, invented the air pump, onwards through the labours of the Abbé Nollet, Snow Harris, Faraday, Geissler, Sprengel, Crooke, and Röntgen. The effects of electrical discharges in air and *in vacuo* were explained, and were illustrated with a number of beautiful demonstrations by Dr. Pepperdene, who took charge of the electrical apparatus. The fluorescence of calcium, tungstate, dolomite, sea shells, coral, rubies, Iceland spar, and other minerals under the influence of the rays was similarly demonstrated, the extreme beauty of the demonstrations evoking cordial applause. The penetrability of the rays through various opaque substances—wood, cardboard, aluminium—was shown by photographs on the screen, many curious examples being exhibited. Interesting radiographs of human bones, healthy and diseased, were also displayed on the screen; and foreign bodies—usually needles or bullets—in the flesh of living persons, broken bones, and the effects of wounds received in battle were also shown in the same way, and formed a highly instructive series. The negatives from which the lantern slides were prepared were taken on the Sandell Cristoid films. Thanks were due to Mr. D P. Roberts, of North End, for the loan of coil and accumulator. Mr. J. H. Baldock manipulated the lantern with gratifying efficiency.

At the close Mr. Whitaker expressed the thanks of the audience to Dr. Williams and Dr. Pepperdene, and this was cordially endorsed by the audience themselves.

THE WELFORD NO. 1 HAND CAMERA.

Manufactured and sold by W. D. Welford, Warwick Lodge, 166, Romford-road, E. The principal characteristics claimed for this hand camera are that it



combines great efficiency with great simplicity. There are no hidden parts to get out of order, and, as dark slides are used, there is no plate-changing mechanism to go wrong.

The dimensions of the instrument when closed are $7\frac{1}{2} \times 4\frac{1}{2} \times 5\frac{1}{2}$ inches, and the weight 2 pounds 6 ounces. The dark slides measure $5\frac{1}{2} \times 4 \times \frac{1}{2}$, and weigh 4 ounces each. The camera has two finders, and a rapid rectilinear lens with iris diaphragm, Thornton-Pickard time and instantaneous shutter, dark slides which open inside the camera, ground-glass focussing screen, rackwork focussing, rising and falling front, cross movement front, is covered with black leather, and has two bushes for fixing to tripod. The lens, specially selected, works at f.8. The finders are readily cleaned, every part being accessible for dusting purposes. In focussing, the ground glass springs into position upon withdrawing the dark slide, the insertion of which again brings it to the back. The rising and cross fronts are clearly shown in the illustrations. The cross front serves as a rising front when the view is taken the other way of the plate. Double dark slides are of wood with metal shutters, and open inside the camera after the manner of a small door. Focussing by scale is also provided for, with a powerful rack-and-pinion movement. Considering the many good points of this hand camera, the price is very moderate indeed.

"LA PETITE" LIVING PICTURE CAMERA AND PROJECTOR.

Manufactured and sold by W. C. Hurges, 82, Mortimer-road, Kingsland, N.

THIS skilfully designed instrument is well named, for within the compass of an ordinary sized hand camera you have the entire apparatus for taking and projecting animated photographs. It is remarkably well made, and the mechanism for passing the film across the focal plane is ingenious and simple. A very good idea of the construction of "La

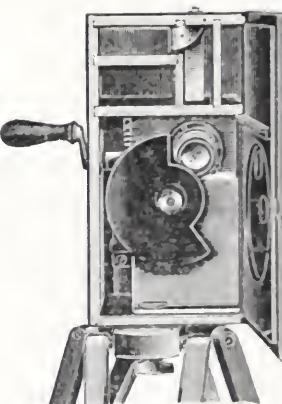


FIG. A.

Petite," and the manner in which it is worked, will be obtained from the following condensed instructions for its manipulation:—

Taking.—Set the camera tripod on firm ground, so that it is perfectly rigid, and, by means of a piece of plain matt celluloid placed in the film race, focus the object to be cinematographed.

Now open the front, and place the cardboard film box into the recess (fig. A). Pass the end of the film over the brass stay, then shut the door



FIG. B.

in front; turn the camera round (fig. B), then pass the film through the race, and again over the brass projection at the bottom of pressure plate, so that the end is outside (fig. B).

Next pass the film into the receiving box (fig. C), and attach the end of the film to the hook on the brass revolving winder, then lock into position by the lever, care being taken not to buckle and catch the film in so doing.

When this is ready, stretch the rubber band on to the pulley, and the machine is ready.

The correct speed for all ordinary subjects is two turns per second.

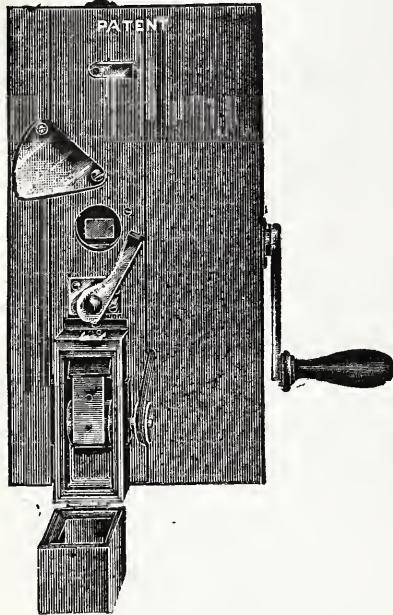


FIG. C.

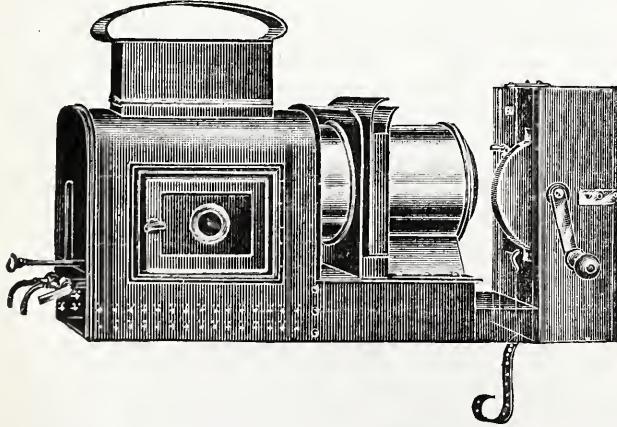
Developing.—The film is wound on to a frame which is supplied with the outfit, the ends being attached by drawing pins in a 12×10 inch dish.

The following developer is recommended :—

A.—Pyro	1 ounce.
Water	70 ounces.
Nitric acid	12 drops.
B.—Soda sulphite	10 ounces.
Soda carbonate	8 "
Water	70 "

For use take equal parts.

Take sufficient developer to cover the frame, which is placed into the dish. Before pouring on the developer, it is advisable to first soak the



film in plain water, thereby ensuring even development. When this is done, pour on the developer, care being taken to thoroughly immerse the film.

The image should appear in about five minutes, and full development be completed in ten to fifteen minutes.

After again washing in plain water place in the fixing bath, 1 part hypo, 5 parts water, and thoroughly fix for ten minutes, after which wash in running water for about one hour.

After the film is washed, to prevent it curling when dry, place it in the following bath for five minutes :—

Glycerine.....	$\frac{1}{2}$ ounce.
Water	20 ounces.

Then place the frame in a warm room till dry.

Printing.—Place the "La Petite" on a firm support, and adjust the light from an oil lamp until central with lens.

Fill in the sensitive film in exactly the same way as for taking, and place the negative in the recess, direct in line and underneath the positive, as the film is printed through the lens, both surfaces towards the lens.

After a few experiments no difficulty will be experienced in hitting the correct exposure.

To develop, proceed in exactly the same way as for negatives, only use the following developer :—

Rodinal	1 ounce.
Water	20 ounces.

Projecting.—Before starting see that the "La Petite" is quite central with the sheet, otherwise a distorted picture will appear.

The stand must be rigid, preferably screwed to the floor, so that there is absolutely no shake.

First adjust the light and throw a disc on to the sheet, then draw the light backwards or forwards until there is even illumination; if the size of picture is too small, draw the machine farther back from screen until the size required is obtained.



If the oxyhydrogen light is being used, it is necessary to use an alum trough between the condenser and "La Petite" thus absorbing all the heat rays and preventing a possibility of firing.

Now place the film in position on the holder, and thread through the race, and through the bottom of machine, so that it can drop into a box or other receptacle, close the door and turn the handle.

Should the film show the perforation at top or bottom of picture, alter it by means of the lever on door.

"La Petite" gives a half-inch image and a roll of film 25 feet long costs 2s. 6d. The instrument itself is priced 5l. 10s. We have carefully examined the clever little machine and some photographs taken with it, and can strongly recommend it to those of our readers who require a cheap and practical camera for taking and projecting animated photographs on a small scale.

THE USE OF MIRRORS IN PHOTOGRAPHY.

THE article on page 179, under the above title, is one that should prove of great value to all workers in photography, for not only does it "give away" a few very good tricks of the trade, but it offers numerous suggestions to those who have the time for experimenting and proving to themselves—and to others if need be—the inestimable value of mirrors.

Personally speaking I have used mirrors in some form or other for nearly all kinds of photographic work, but it was not until I went to work in the Louvre picture galleries in Paris that I saw mirrors rendering what I believe to be their greatest services. Needless to say, they were used in the work of copying some of the many beautiful paintings in that building, and by an operator who had been practising that particular branch of work for twenty-nine years. It was my good fortune to be sent to the Louvre as his assistant, for we both at that time were working for the same Parisian firm. His easy manner of working and his

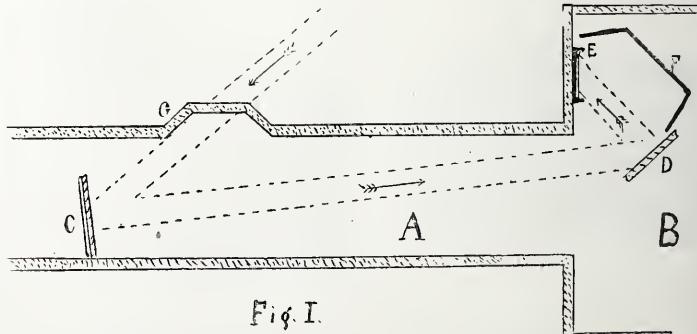


Fig. F.

accurate estimation of exposure brought forcibly to my mind the truth of the old adage, "Practice makes perfect." It was indeed a pleasure to develop his negatives (size about 15×12 inches), they were so perfect. Unfortunately, his methods look much more difficult on paper than they were in actual work, but by the aid of two diagrams I hope to be able to give an idea of how he managed to successfully light, and so secure two valuable negatives of two of the most difficult subjects in the Louvre. At the moment of writing I am some hundreds of miles from home and my note-books, or I would give the names of the pictures and the rooms in which they are hung.

Many of the galleries in the Louvre are—as many of my readers are perhaps, aware—lighted entirely from the roof, with the result that, when a camera is placed opposite pictures that are nailed in contact and level with the wall, some ugly reflections can be seen upon the ground glass, more especially if the painting be very much cracked or shiny, as were

the two about to be described. Under ordinary circumstances it was absolutely impossible to obtain even a passable negative of them.

Fig. 1 illustrates the position of one of these pictures, A is a long corridor quite 100 feet long; B is the room in which the picture, E, was hung about 6 feet from the floor. The operator first of all focussed the picture, and then placed round the camera and picture a large folding black screen, F, possibly 12 feet in height, this screen shut out nearly all the light from the picture; in fact, when I stood inside the screen beside the camera, it was almost impossible to see what the picture represented. The corridor, A, was lighted from the roof, but at the extreme end was a large window, G, reaching to the floor, and through this window the sun was shining very brilliant. A large mirror was placed at C, and the sun's rays thrown down the whole length of the corridor on to another mirror

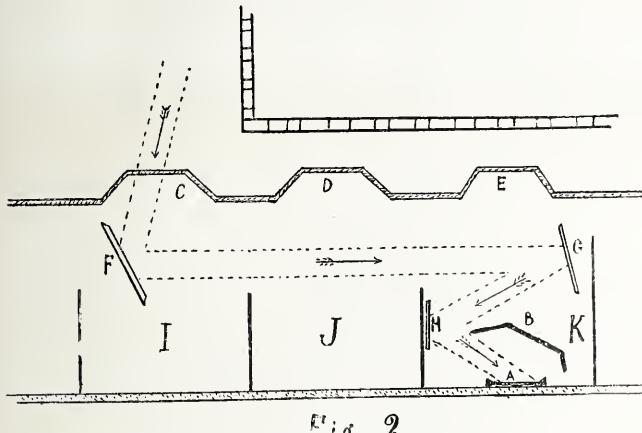


FIG. 2.

at D, which I held, and reflected the rays on to the picture at E. I kept the mirror, D, moving for about two hours, the length of time given for exposure, and a good negative on a Lumière's orthochromatic plate was the result.

We worked on the same principle in copying a picture as shown in fig. 2. In this particular case there was no light coming from the roof, but through very high windows, which was as bad, if not worse, for lighting the narrow corridor in which were three recesses, I J K. The picture we were to copy was at A, in recess, I. Fortunately, some adjoining buildings stopped the sun pouring in at windows, C and D, but at E the sun shone brilliantly. The picture was focussed, and the large black screen, B, placed before the picture. The sun's rays were caught on a mirror at F, reflected on to another mirror at G, then again on to a large screen made of silvered paper, H, and then on to the picture, A. The mirrors, F and G, were set up on chairs at the proper angle, whilst the screen of silver paper was held and kept on the move by myself. Time of exposure about three hours, and a good negative was the result.

We copied some hundreds of pictures and frequently used mirrors, large and small, little and much, but in the two cases cited they were of the greatest use.

RICHARD PENLAKE.

AN ACCOMMODATION SLIDE FOR THE LECTURER.

It is one thing to acquire knowledge, and quite another to impart it, and the latter is the work of the lecturer.

To be successful, the means employed should be convincing rather than elaborate, and to convince an audience I suppose the first essential is clearness. Simplicity here applies alike to words and experiment with apparatus.

Lecturing recently on the subject of "Our Eyes and their Use," I found that apparatus previously constructed expressly for the purpose afforded me the means, not only of securing undivided attention, but also of illustrating in a most convincing manner the statements I found occasion to make.

This demonstrated usefulness induces me to give a brief description of one of the appliances I found especially handy, with the hope that it may prove of service to others.

The apparatus in question is shown in figs. 2 and 3; but, before fully describing this, let me direct the reader's attention to fig. 1. It is a well-known fact that, in order to see an object clearly, its image must be brought to a focus upon the retina of the eye, and this cannot be accomplished without that change termed accommodation.

If the object of attention be situated at B (fig. 1) with its image in focus upon the retina at B', the image of an object situated closer to the eye, at C, will be brought to a focus behind the eye at C', whilst the image of an object situated at A will be brought to a focus too soon for distinct vision, and will be within the eye at A'.

By accommodation the eye is capable of bringing each of these objects in focus upon the retina in succession. The objects out of focus, however, are not entirely lost to view, and their varying degree of clearness, according to their distance from the eye, contributes to that visual combination produced in the mind of the observer, so essential to a general knowledge of his situation in relation to his surroundings.

Although the object of this article is not to point the changes in the

optical combination of the eye when viewing objects at different distances, it may be interesting to note that, if the aperture of the iris and curvature of the lens be such as shown in the diagram, on turning the attention to the foreground object, C, the iris will contract, the pupil

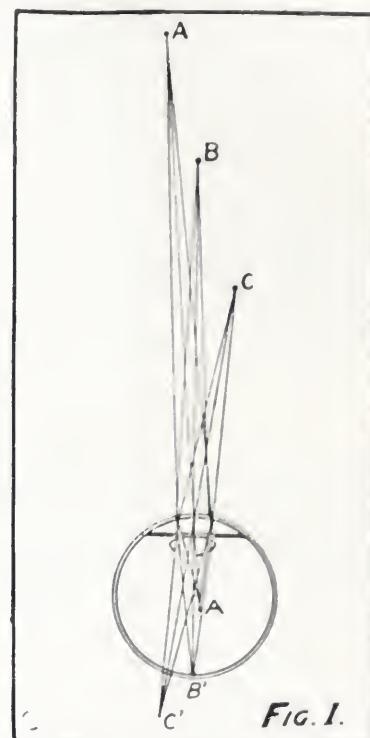


FIG. 1.

become smaller, whilst the lens will take a more convex form. The order of such changes will be reversed if the attention be turned from the nearest object, C, to the remote object, A.

Now, it is obvious from these facts that the picture projected upon the retina, must be an ever-changing one, with regard to the focus of objects

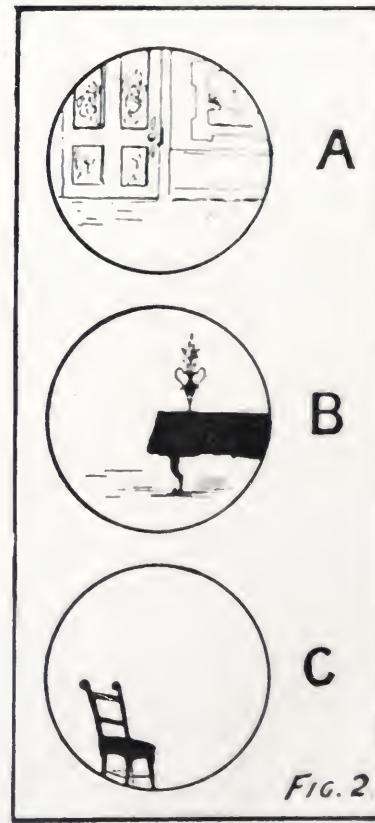


FIG. 2

in the view, to say nothing of their varying position caused by divergence and convergance of the axes when both eyes are used.

Were it possible, then, to view the ever-changing picture on the retina of a person's eye under the changes of accommodation, what kind of a picture should he see? This question is fully answered, and the effect demonstrated by means of what I have called "an accommodation slide."

This slide is to be exhibited in an ordinary single optical lantern, and the projection upon the screen will be a representation of the retinal picture when the eye is brought under the influence already mentioned.

Objects situated at three different planes, A, B, C (fig. 1), are painted upon three separate pieces of glass. Reference being made to fig. 2, suppose the remote plane to be occupied by a door, wall, and picture frame, A. The nearest plane occupied by a chair, C, and half way between the chair and the opposite side of the room, a table stands, upon which is placed a vase of flowers, B.

These three glasses are now fitted into suitable framework, such as shown in fig. 3. The middle glass, B, is fixed, but the two outside ones, A and C, have space to move backward and forward along the groove, the object of which will be pointed out presently.

The objects are painted upon those surfaces of the glasses indicated by the arrows. The distance between A and B should be about a quarter of an inch, whilst the distance between B and C should be rather more. This slight difference in separation of the objects will, in use, correspond with the greater change in accommodating the eye from two distinct near planes, and that necessary for accommodation when directing the attention successively to and from two distinct remote planes.

If the slide is now placed in the lantern in the usual way, it is clear that only one of these objects will be in focus upon the screen at the

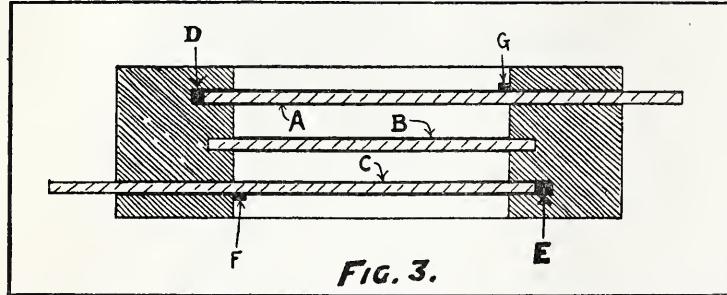


FIG. 3.

same moment, and that either chair, table, or wall, may be brought into focus at will.

The combined effect will thus be similar, if not identical, to that produced in the eye under natural circumstances, the attention of the observer always supposed to be directed, or adapted, to that object or plane which happens to be in focus upon the screen.

Needless to say, to ensure the best results there should be some intelligent communication between operator and lecturer.

If accommodation is all that the lecturer desires to illustrate, the three glasses may be fixed; but, should he wish also to show the dissimilar pictures of the retina of each eye under conditions of binocular vision, he may do so by leaving the spaces, E and D (fig. 3), so that the two outside glasses may be shifted. This movement will, of course, alter the relative position of the objects situated at different planes.

When demonstrating this difference in binocular pictures, the operator should first make B his focal plane, so that a fair amount of clearness may be distributed over the three dimensions of the view. Then, with the three glasses in the position shown in the diagram, the objects as situated from the left-eye standpoint will be shown, and, by pushing the two outside glasses to the end of the grooves, a representation of the right-eye view will be obtained, the movement of the shifting glasses being regulated in the first instance by the stop blocks, F and G, glued to the surface of the glasses; and, in the second instance, by the depth of the grooves, E and D.

THEODORE BROWN.

A BINOCULAR PROOF OF A BLIND SPOT.

By examining the black-and-white diagram in a stereoscope, the presence of a blind spot in both eyes may be very clearly demonstrated.

The action of the prismatic lenses of the instrument will, of course, present to the mind of the observer a single set of three white circles, and, if the attention be directed to the small centre ring, the observer will be conscious of the presence of two white spots, one on either side of the second ring.

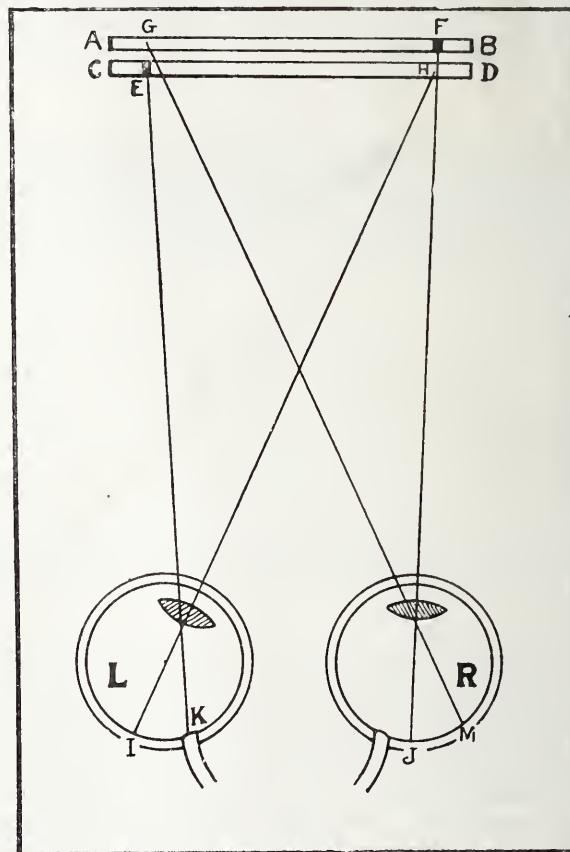
Now, if the axes of both eyes be turned towards the left-hand side spot, the other one will immediately vanish from view, and if, on the other hand, the eyes are directed towards the right-hand side spot, the left-hand spot will vanish.

The phenomenon, if such it may be called, may be explained by reference to a diagram having two sets of rings and viewing it in the stereoscope, they are, of course, seen at the same place, presenting for observation a combined image. Let us suppose the left-hand picture to be situated at C and D, and the right-hand picture A and B, the eyes of the observer at L and R. The diagram shows the axes of both eyes

turned to the same place, i.e., H, in the left-hand picture, and F in the right-hand picture.

Under such circumstances the spot on the right-hand side only will be visible, and this only in the right eye, R, at J, the other spot, E, on the picture, C D, being invisible, because the rays which emanate therefrom fall upon the base of the optic nerve in the left eye, L, at K, the surface of which is insensible to light.

Now, suppose the attention be turned towards the opposite side of the combined image, rays emanating from F will at once fall upon the base of



the optic nerve in the other eye, R, with the result that the spot, E, will vanish, and the other spot, F, come into view.

If a white spot be painted on the dissimilar pictures of a stereoscopic pair in the positions shown, the phenomenon will be still more clearly demonstrated. By examining the combined image in the stereoscope, and directing the attention to either spot, the one on the opposite side will vanish, whilst, by turning the attention to the train, both spots will be seen obliquely, and appear one on each side.

According to the separation of different persons' eyes and their focus, I have found it necessary to vary the separation of the two white spots, but a separation of $4\frac{1}{2}$ inches is found correct for most persons.

W. T. HOOD.



MONTHLY SUPPLEMENT

To the "BRITISH JOURNAL OF PHOTOGRAPHY."]

June 1, 1900.

THE LANTERN RECORD.

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THE SOLAR ECLIPSE.

TUESDAY's newspapers contained many accounts stating that the solar eclipse of Monday, May 28, had been observed under favourable conditions. A telegram from Ovar reported that the expedition from Greenwich met with perfect success, so far as was then known. A fine day gave promise of a successful eclipse, and, except for some haziness in the atmosphere, the sky at the time of totality was all that could be desired. The scene was, apparently, not so much darkened during the total phase as is sometimes the case. Venus and Mercury, which were quite near the sun, were seen by the naked eye, but no stars were visible, although there were some bright ones in the neighbourhood. The corona, as was expected, proved to be of the type represented by streamers from the sun's equator, which to the naked eye looked short, and with the short plumes at the poles, but it is necessary to wait until the plates are developed before this point can be definitely stated. This fact is very interesting, as it very much strengthens the evidence for the theory that the form of the corona is associated with the sun-spot cycle. At the eclipses of 1867, 1878, and 1889, which were all within a year of a minimum of sun-spots, the corona was seen of this form. On four other occasions—namely, in 1860, 1870, 1883, and 1893, which were near epochs when the spots were many—the corona was of quite a different type, the streamers in these cases being much shortened.

From New York it was announced that the eclipse of the sun was observed with great success at several places in the path of totality. Satisfactory observations are reported from Siloam in Georgia, and Wadesborough in North Carolina. At Wadesborough there were more astronomers and scientists staying than at any other point of observation, the visitors including, among others, observers from the Smithsonian Institute, Princeton College, and the Yerkes Observatory. Amongst the English visitors were Miss Bacon, Miss Woolston, Mrs. Dixon, and Mr. Maskelyne. The equipment of the British Astronomical Association was perfect in every detail. At Thomaston, Georgia, the conditions were ideal, and the results of the observations exceeded what was hoped by the most sanguine watchers. Data of immense importance were secured. The eclipse began at 6 hrs. 31 mins. 24 secs. a.m., and ended at 8 hrs. 55 mins. 46 secs. The Lick Observatory party of observers was most extensively equipped with apparatus for covering the whole range of phenomena, including spectroscopic, telescopic, and photographic work. The spectroscopic observations included analyses of the phenomena of light preceding, attending, and following totality. A thin black wedge first became visible on the outer edge of the sun, and gradually overspread the whole disc. The resulting spectacular effects were almost startling to those who had not previously seen a total eclipse. Before totality the usual curious twilight began to prevail, and became intensified as the dark moon spread over the entire surface of the sun. The darkness was then relieved by the radiance from the corona,

which extended in two beautiful streams of light from each side of the sun's equator. Innumerable photographs were obtained by the observers, among whom were Messrs. Wilterdink and Nyland, from Holland, and Mr. Lumden, of Toronto. The darkness which accompanied totality threw the negro population into a state of frenzied fear. Many prostrated themselves on the ground and prayed in loud voices, while others shrieked hysterically. Animals, too, were frightened, and the alarmed barking of dogs and lowing of cattle contributed an indescribable weirdness to the gloom. At many other places the eclipse caused similar alarm among negroes, who, in some instances, were convinced that the end of the world was at hand.

The eclipse was observed at Plasencia under most favourable circumstances by a large party of British and Spanish astronomers.

Both visual and photographic observations were successfully made. The shadow band was seen both before and after totality, lying in a north-easterly direction, and travelling south-east, for the moon's shadow was not seen either on the ground or on the sky. The corona was of the typical sun-spot minimum appearance, with large extensions in the direction of the sun's equator, which were traced to about two diameters' distance from the sun. Two large prominences were seen on the sun's western circle.

Neither cloud nor mist was in the Algerian sky during the eclipse, though, perhaps, the atmosphere was not entirely free from dust. The corona was of the minimum type, and the western wing of the well-known fish-tail form were distinctly visible to the naked eye, while the eastern wing seemed a single streamer.

The largest party of Algerian observers were encamped on the roof of the Hôtel de la Régence, where they were happily inaccessible to the mixed native population, who greeted the total phase in the most approved Eastern manner. Here Mr. and Mrs. Maunder again attempted to get focussed on the coronal streamers, and with Mr. Davies took a photograph of the partial phase. Probably the success of both of these depends on the clearness of the atmosphere. Messrs. Cromlin and Davies also took a photograph of the inner corona. Meteorological observations were made by Mr. Brook, and a most important shadow-band observation by Mrs. Brook. These bands travelled in the same direction before and after totality, and were not unbroken lines, but a series of suns and of shadow patches, the patches moving faster along the suns than the suns themselves moved forward.

From Algiers we also learn that the effect as the eclipse approached totality was inexpressibly weird. As darkness crept over the earth, the sea lost its deep blue and became of a spectral grey, while the vivid green of the sub-tropical foliage turned to a funeral purple hue. Just as the last sun-ray faded, the corona instantly shone forth unusually large and brilliant, extending as far as the planet Mercury, which was shining with an intense white lustre about two degrees away from the sun's disc. The shape of the corona was almost exactly that of the eclipse of 1878, as seen in the United States, with two great wings, one shooting almost vertically upwards, the other downwards, both almost exactly on the solar equator. It was a corona typical of the time of sun-spot minimum.

The weather at Tripoli was splendid, and the Lowell University Eclipse Expedition, under Professor Todd, of Amherst College, United States, America, made complete and successful operations with twenty telescopes and photographic apparatus. One of the telescopes used had an object-glass of twenty-four inches. The corona was seen for fifty-two

seconds. It was an exact duplicate of the corona observed in January 1889, thus completely confirming the theory of the eleven-years' period of the corona and its variation with the sun-spots.

At Wadesboro, Georgia, observations were taken by experts from the Smithsonian Institution and the British Astronomical Society of London, and by other scientists, who all unite in describing the conditions as being perfect for observing the eclipse. Professor Barnard, of the Yerkes Observatory, stated that the period of totality was slightly shorter than had been calculated, which proved the tables to be slightly incorrect.

The results obtained in the observation of the eclipse at Barnesville exceeded the most sanguine expectation. The corona flashed out in a double fanlike form of great beauty. Several solar prominences were distinctly observed on both the following and advancing limb. Those on the approaching limb, however, were more distinct and continuous.

LIMELIGHT LECTURING TO THE DEAF AND DUMB.

To many there may appear insuperable difficulties in the way of any lecturer, unacquainted with the manipulation of the deaf and dumb alphabet, in being able to convey to an audience composed of mutes anything like a satisfactory description of his set of transparencies, or make his lecture in any way interesting. The fact is, however, that any lecturer can, with the greatest of ease, give lectures or limelight entertainments to audiences composed of mutes without his having the slightest knowledge of the deaf and dumb alphabet, or the numerous signs connected therewith, and this form of entertainment is fast becoming highly popular with many of our deaf and dumb institutions, for but few weeks are seen during the winter months in which a limelight lecture is not found forming a part of the instruction provided for their special benefit. It has been remarked that mutes, somehow or other, pay more attention to the instruction they receive from those teachers who have all their faculties than they do to such of their brethren as are afflicted like themselves, and it is a noticeable fact that those classes presided over by mute teachers are never so well attended as are those otherwise provided. This, doubtless, accounts for the large attendance which always welcomes a popular lecturer when he is announced to give a limelight entertainment, for there are few, if, indeed, any, absentees from among the mutes at such functions. The enjoyment they derive must be seen to be realised, and any one who has never lectured to such an audience can form no idea of the zest and rapt attention which pervade these poor people, and the manner in which they pick up some desired information is truly marvellous.

Although the arrangements for functions of this description differ but slightly from lecturing under ordinary circumstances, there are one or two points which any one having no experience of this kind of entertainment would do well to observe.

The first is, that such audiences are extremely critical, and they can discern the good from the bad in the matter of the quality of lantern slides shown more keenly than another ordinary audience would do.

Secondly, there must be plenty of views provided. An ordinary set of about sixty to seventy slides would go no length with an audience composed of mutes, for lengthy descriptions of the different views are quite out of the question, so that a quantity more nearly approaching two hundred will be found none too many to fill in a good night's entertainment. Any ordinary lecture set can be used, provided there be added thereto a number of slides containing printed or written matter. These will be found exceedingly useful when the lecturer desires to convey some special point or information regarding his subject, such, for instance, as would be the case in describing an old advertisement, or showing a facsimile of an important letter or document to which it is desired to refer minutely. The providing of numerous slides of readable matter is a very important feature in lectures of this description, and go a long way to make much understood which would otherwise fail to be comprehended. An example of slides of this description may be briefly described as follows: "The next six slides will convey to you such-and-such information." In providing slides of this description, it does not necessarily follow that they should be produced by means of photography; they can be prepared in a very few minutes' time by writing on clean cover glasses with the aid of a clean pen and a modicum of Indian ink, and by their means it will be found that quite a lot of interesting information can be conveyed, and it will be soon apparent that such slides are much appreciated by the audience, simply by reason of the

fact that the deaf and dumb are not slow to observe that they have been expressly prepared for their benefit.

The lantern arrangements should be such as will provide a sufficient large disc, and will permit of slides of readable matter being easily read at the back of the hall. In general practice it will be found that a disc that is in size one-fourth the greatest length of the hall will suit nicely in this respect.

With nearly all well-appointed deaf and dumb institutions there are always associated some one possessed of all his faculties who at times is only too willing to act as interpreter, for it is really only by the aid of such that lectures of this description can be given.

During the past season the writer delivered a lecture before an audience of mutes in the Royal Institute for the Deaf and Dumb, at Glasgow; and a brief description of the manner in which it was carried through may be read with interest. In this institution, it may be stated, the optic lantern is taken advantage of to its fullest extent, and every season sees quite a long list of lectures by gentlemen who know absolutely nothing about "finger language," but who are enabled, nevertheless, to afford much instruction and pleasure through the medium of the chaplain, the Rev. Mr. Henderson, who invariably acts as interpreter. The method adopted on that occasion was as follows: The lantern was manipulated from the back of the hall, at a distance of about fifty feet from the stage. A twelve-inch objective was employed, and it was found that slides of printed matter were easily readable at this distance when the lettering was not too small, and all the written slides appeared quite large upon the screen. The writer took his position on the platform to the right of the screen, armed with a long pointer. On the other side of the screen the Rev. Mr. Henderson took up his position, being furnished with an electric lamp enclosed in a cone-shaped reflector, so placed as to concentrate the entire light from the lamp on his hands and chest only. This prevented any light striking back upon the screen and interfering with the brilliancy of the picture.

In lectures of this description reading from a text-book or other written matter is quite out of the question. The lecturer must have his subject off by heart, and speak entirely from experience. This naturally leads into a pleasant conversational turn between him and his interpreter, the lecturer speaking somewhat slowly. His remarks are conveyed by signs and grimaces in a marvellously rapid manner to the audience, who seem to know by instinct what descriptions are to follow; and the sight of the faces of the mutes during such a lecture is one never to be forgotten. To say that they are "quick in the up-tak" is putting it mildly and, should it so happen by chance that any one in the audience has failed to grasp some point or portion of desired information, he immediately appeals to one of his brethren near to him by means of signs or mysterious grimaces until the desired information is obtained, and this passing of information from one to another is perchance the most striking of the many interesting features connected with entertainments of this description. A few seconds will suffice for any information being passed through the audience from one end of the hall to the other. Nor are the mutes slow to show their appreciation of what is being submitted to them; this they do with their feet, and but seldom use their hands otherwise than for speaking purposes; in fact, during the entire course of the lecture, it may be said, they kept up amongst themselves a dropping silent conversation by means of their hands and lips. Nor, on the other hand, are they slow to express their approval by "thumbs up" or "thumbs down" when anything strikingly good or bad happens to be brought before them. Somehow or other it would appear that beforehand they always look out for a brother mute who is known to possess some special knowledge of the subject that is going to be dealt with, and to him they appeal during the lecture by signs if they are at any loss to understand what the interpreter is communicating, or desire more information regarding the matter being described.

Some may imagine that this continuous passing of signs among the audience would prove somewhat disconcerting; but, in reality, it has no such effect upon a lecturer, a few minutes will suffice to set him quite at his ease. Now and again it is quite possible he may somewhat forget the circumstance he is placed in, and, from force of habit, find himself speaking to some one at the back of the hall instead of only addressing his interpreter; but he soon picks himself up, and gets into a more reasonable strain of voice. From this it will be seen that flowery declamation of any particular part of a subject is quite thrown away upon such an audience. On the other hand, a few jokes and conundrums, conveyed by means of specially prepared slides and thrown upon the screen, always tell well.

At the close of entertainments of this class the mutes are never slow to show their appreciation of what has been done for them, and, were

more of such lectures provided for these afflicted members of the community by the numerous limelight lecturers, who can well afford to give their services for nothing, much pleasure and comfort would be bestowed upon a deserving class who are too seldom thought about.

T. N. ARMSTRONG.

BINOCULAR VISION AND ITS RELATION TO STEREOSCOPIC PHOTOGRAPHY.

HERE is a close relationship between the laws which govern binocular vision and those controlling the perception of relief in the stereoscope. There are, however, certain modifications in the latter which must be recognised if success is to be ensured in stereoscopic photography.

It is a well-known fact that in nature we correctly appreciate all objects in the view before us by a continual change, not merely of the axial direction of our two eyes, but also by a change in each eye separately, known as accommodation.

As already mentioned in a previous article on the subject, this adaptation of the optical combination in the eye produces upon the retina a picture which is ever changing as regards the focus of images of objects situated at various distances from the observer.

As these facts have an important bearing upon the subject of picture-making in general, it will be of some value to us if we first consider the nature of the picture upon the retina of a single eye, and then observe

the most desirable arrangement, as the attention is, of course, intended to be directed to the sitter, and not the surrounding objects.

When I look at some of the pictures which have hung upon the walls of the Royal Academy I am inclined to believe that the physiological education of some of our most eminent artists has been sadly neglected, at any rate with regard to those branches of the science pertaining to the optical structure of the human eye. One picture especially comes to my mind at this moment. Naturally the attention is turned towards a group of females lounging in the foreground. They are sharply outlined (and this is well), but when one finds, on looking over a low fence behind them, that the mountains, supposed to be miles away, are also clearly defined, we are strengthened in our belief of this lack of optical knowledge on the part of some men of the brush.

But it must not be supposed that a thorough knowledge of natural optics would enable the artist to paint his picture so that accommodation would be called for. It is obvious that such a change is only demanded when objects are actually situated at different distances from the observer, and not merely represented to be by the agencies of proportion, perspective, and shading. It is herein we find that paintings and photographs lack that something which, did they possess, would impart to the mind of the observer a sensation yet to be realised.

The foregoing remarks apply to single pictures, photographic or otherwise.

Now let us proceed a little further, and consider how much we have

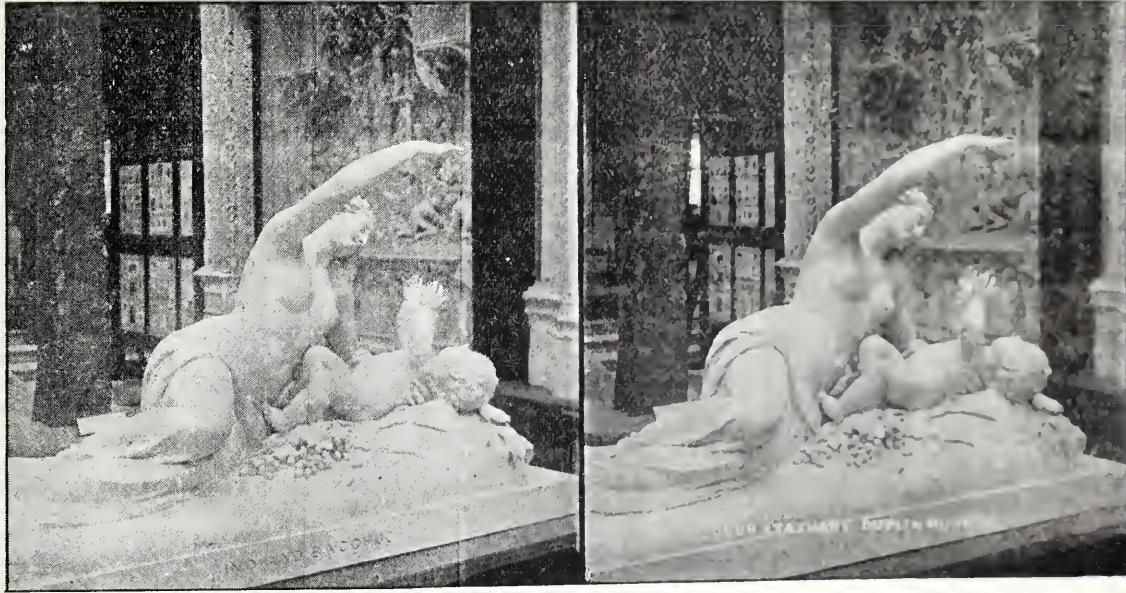


FIG. 1.

wherein it differs from that image projected upon the retina when examining a single photograph.

In the first instance, as already stated, in nature we are continually altering the focus of the eye to suit objects situated at different distances, with the result of an ever-changing retinal picture. The reason of this necessary change will be clearly understood by any reader possessing but little knowledge of light, sight, and optics.

Contrary to this natural demand, in looking at an ordinary photograph there is no change in accommodation called for. Once having placed the photograph at a suitable distance from the eye, with all objects, whatever their supposed distance in the view may be, and however true the proportion, perspective, and the shading of the whole composition may be, there is still no demand made upon the senses of the observer to focus his eye for distinct vision of various parts. In other words, those parts which happen to be in sharp focus in the photograph will likewise be sharply focussed upon the retina of the eye, whilst other portions of the view more or less out of focus will likewise be seen to that particular degree indistinct.

Hence we see that natural accommodation of the eye will never be called for from the face of a single picture, whether it be a painting or a photograph, and this raises the question, What plane ought to be sharply focussed in a view, or what object in a picture should be most clearly defined? This is a very wide question, the answer of which would vary according to the subject. In portraiture I observe the general rule to be, background out of focus, subject in focus, and, to my mind, this seems

gained by the introduction of a pair of dissimilar pictures such as we prepare for the stereoscope.

We have seen that natural accommodation will never be called for from the face of a single picture, inasmuch as only one plane is presented for observation. We are next led to inquire, Does this double presentation to the mind in the stereoscope create this demand and produce the desired effect? The answer is still in the negative. Though we have gained much, our double pictures requiring convergence and divergence of the eyes' axes before they may be properly blended in all respects, our combined image still lacks that essential to a natural demand for accommodation.

Again, our double proportion, perspective, and shading may be correct, yet we are bound to admit we are far from that ideal sensation nature seems alone able to impart.

Though we have gained relief and created an artificial demand for axial change of the eyes, though the two pictures projected upon the two retinæ of the eyes are dissimilar combinations, each possessing a perspective peculiar to itself, though we use our best means, presenting these two dissimilar pictures in natural colours, we have at last to confess our combined coloured image is not a binocular presentation to the mind such as seen with a pair of good eyes.

By a thoughtful reflection on what has already been said, we note one point in particular where the perception of relief in the stereoscope differs from the perception of relief under conditions of binocular vision, namely, that, in the former case, all objects are actually situated at one

distance from the eyes (the surface of the photograph), whereas, in the latter instance, an indefinite number of different planes are presented for observation.

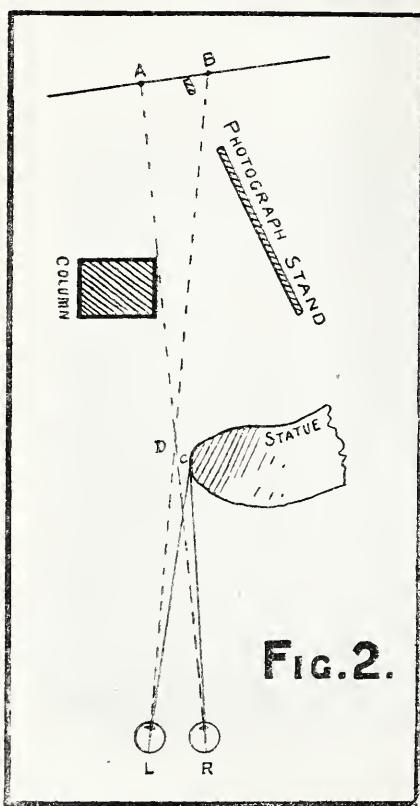
This difference is of greater importance than it at first appears, and indeed, by a careful examination of some of the distracting effects which occur in some stereoscopic slides taken under certain circumstances, we are led to value the knowledge of these facts, and by their recognition avoid in practical work much which to the stereoscopic expert must ever be a source of annoyance.

One of the undesirable effects I have in my mind is that of floating images, or perhaps it would be more correct to call them portions of images, which, in the stereoscope, the observer finds difficult to locate, the cause of which I have anticipated in the foregoing observations.

Although fig. 1 is not a very glaring example possessing the peculiarity referred to, it will serve to illustrate the truth of my remarks.

From a technical standpoint, this stereoscopic picture is a beautiful piece of work, the credit of which is due to Messrs. Seaman & Son.

But there is just one thing which unfortunately mars the whole composition, and which might have been avoided by photographing the subject from a slightly different standpoint.



On examining this slide in the stereoscope, the attention is, of course, directed especially to the mother and child, the chief figures in the view. Whilst the axes of the eyes are crossed at this plane, and the attention fixed here, oblique rays emanate from the surrounding objects quite in an agreeable way to the eyes, except at one point, namely, just off the end of the mother's body. Here we find a little white patch, apparently at the same plane as the mother and child, but floating in mid air. It is most noticeable if, after looking for a few moments at any portion of the statue, the attention is turned to this point. Now, this effect spoils rather than adds to the beauty of the composition, and it is an effect which occurs in a far more conspicuous manner under similar circumstances in other views.

I have a stereoscopic view in my collection of a rabbit in a box with wire netting in front. By a slight movement or change in the focus of the lenses of the stereoscope, I am able to make the animal spring out of his box, so that he appears outside with the wire netting behind it.

I have another view in which, unavoidably, the sleepers under the rails over which a train is passing appear, not as they should be, below the metals, but on a level with the foot plate, giving a most peculiar and distracting effect in the stereoscope.

These and many other examples which I could give, did space permit, present such odd appearances in the combined image in the stereoscope, from the fact that, when photographs are viewed, no accommodation is

called for, and therefore it becomes an easy matter for the eyes to be deceived, and appreciate objects which in nature would be almost invisible to the observer.

This will be better understood, perhaps, by making reference to fig. 2. This is a diagram showing the position of various objects in the slide (fig. 1). As we have noted, the white patch appears floating in mid air, at the same distance from the eyes as that plane at which the statue is situated. The reason of this is, that when the statue is being looked at the eyes cross their axes at the point, c. Oblique rays, A R and B L, emanate from the nosing of the steps (see photograph), and fall upon agreeable parts of the retina in each eye, so that, if the eyes are turned to the left, the point, D, falls upon the axes of the two eyes, and the images, A and B, are appreciated as one object situated at D, whereas the retina is really being ramified by rays emanating from two entirely separate parts of the distant object, the nosing of the step.

In this particular instance the column, statue, and the leg of the photograph stand play an important part in bringing about the phenomenon by hiding from the eyes certain parts. The right eye, R, is prevented from seeing the image, B, by the statue intercepting; the left eye, L, is prevented from seeing the image, A, by the column, whilst the leg of the photograph stand splits up into two white patches the nosing of the step.

From these facts it is obvious, if such distracting effects are to be avoided, thoughtful care must be exercised in deciding from what point of view a subject should be photographed in order to prevent results of this character in the stereoscope. It has been impossible in this short article to do more than intimate the reason of certain defects in stereoscopic work. Unless the reader has a thorough knowledge of optics and binocular vision in relation to the perception of relief in the stereoscope, he should avoid photographing stereoscopically views with railings in them, or fences where patterns repeat themselves, or troubles of the sort mentioned must be anticipated.

THEODORE BROWN.

A PLEA FOR PICTORIAL LANTERN SLIDES.

AMONG a very considerable section of photographic workers there exists an idea that the making of a lantern slide is one of the easiest of photographic manipulations. Of a certain kind of slide this may be true, yet it is, nevertheless, a fact that the production of a slide technically excellent, and at the same time possessing artistic merit of a high order, is by no means an easy matter. An examination of any fairly large collection of lantern slides will at once show that only a small proportion can claim the possession of real pictorial excellence. This may be due, to some extent, to the fact that many workers of great ability seldom attempt to produce their pictures on any medium other than paper; but there is no doubt that many workers who are capable of producing the highest class of work on paper fail altogether to do their pictures justice when they attempt to show them through the medium of the lantern slide.

Now, why should this be? In the first place it must be admitted that very little encouragement is given by the general public to the worker who strives to give his slides something like real pictorial quality. There seems to be an impression abroad, that unless a lantern slide is very brilliant—black and white, in fact—it is of inferior quality. It is a little difficult to say why this feeling should exist; probably its origin may be traced back to the days when the oil lamp was so very much used, and the necessity existed for a very clear slide.

On account of the weak light a slide of great brilliancy was required, and, although methods of illumination have changed, the quality of the lantern slide has not altered correspondingly, people have become accustomed to the extremely brilliant, not to say harsh, effects so often seen on the screen, and anything different is not appreciated as it probably deserves to be. The natural result, then, is that the majority of workers aim at the production of that which will please, hence so many slides of the clear glass and shadows order. Every one who has attended a lantern show will have noticed how a slide of excellent quality, but, perhaps, portraying some subject which presents no very strong effect of light and shade, may be received almost with silence, while another of the black-and-white order, perhaps showing a waterfall as a streak of pure white, and trees as having received a shower of snow, may be loudly applauded.

But lack of appreciation on the part of the public is not the only reason for the want of artistic excellence so often observed in slides. It may be that many workers, having been so long accustomed to the ordinary run of slides, conclude that as a means of real picture-making this is an unsatisfactory method, and never give the lantern slide a trial; or, possibly,

hey consider that a lantern slide is a very small affair into which to put their best efforts, and accordingly the picture does not receive the attention it deserves, and would get, were paper the medium employed. This last reason is very likely to be a common one. We must allow that here is very little to show for our work, so far as bulk is concerned, in a lantern slide, yet we must not lose sight of the fact that the picture is to be viewed on a very much larger scale than any one would ever dream of showing work on paper. The inevitable disappointment comes as soon as the picture is projected on the screen, and then the process is sure to be blamed. The prevalence of so much indifferent work has brought about the idea, among some workers, that the lantern slide is not a suitable means for pictorial representation, that the capabilities of the process are quite inadequate for the requirements of the pictorial photographer. It is rather unfortunate that such an impression should get about, because, if we look carefully into the matter, we find that the lantern slide seems peculiarly fitted for pictorial work.

We sometimes hear the question asked in all seriousness, "Should a lantern slide have any clear glass about it?" Such a question is, of course, absurd; we might as well ask if a picture on paper should show any white lights. The slide must be treated as a picture, and, if the subject represented demands clear glass, then clear glass there should be; while, if the subject be one in which brilliant high lights would be objectionable, then a lower-toned picture should be aimed at.

The lantern slide seems peculiarly fitted for pictorial work by reason of the long range of gradations we can get with it. One of the greatest obstacles the landscape photographer has to encounter lies in the difficulty of rendering on paper the extreme brilliancy in sunshine we see in nature. This sparkle can in some measure be rendered by means of the lantern slide without loss of transparency in the shadows of the picture, an effect we are so apt to produce on paper when striving after great brilliancy.

For pictorial purposes it is sometimes of advantage to raise or lower the key in which a picture may be rendered in the negative. This is often done in enlarging, and it is quite possible to adopt the plan in producing a lantern slide.

In lowering the key of a picture, over-exposure must necessarily be resorted to; but over-exposure need not mean flatness. Some of the very best slides are secured by means of a generous exposure, followed by slight over-development, and a subsequent short immersion in the ferricyanide reducer. By this means only the highest lights of the picture are cleared, the rest being left beautifully subdued.

Some one may say "that is all very well when we wish to lower the general tone of a picture; but, if it is desired to raise the key, to get, say, a strong slide from a rather over-exposed negative, then a lot of high lights of about equal value will be produced, and we cannot sun down where we would like as in the case of a paper print." The same objection would be raised in every case where undesirable high lights presented themselves; but, if the following plan be adopted, even this difficulty may be overcome. There is nothing new about the method; the last time the writer heard the plan advocated was by the President of the Edinburgh Photographic Society.

Let us suppose we have a slide which, in the matter of technique, is satisfactory, but which requires one or two obtrusive high lights toned down. The slide must be placed film to film with an unexposed lantern plate and an exposure of a few seconds, only sufficiently long to affect the high lights, made on the plate through the slide. The plate must now be developed, and the result will be a negative image. This negative image is prepared with a view to being placed in contact with the slide, acting as a cover glass, when it will be obvious that the negative image will coincide with the high lights of the slide, and in this way lower their brilliancy. It will not be desirable, however, to have all the lights toned down, and, in order to prevent this happening, it will be necessary to remove the negative image from the parts which are to be left clear. This is easily done with the ordinary reducer of ferricyanide and hypo. The negative image must, of course, be very weak—more or less so according to the amount of toning down required—and it is very necessary to see that the cover glass carrying this image is in perfect register with the slide.

This method is a great power in the hands of lantern-slide makers; it means, perhaps, some little trouble, but the result is ample recompense, the difficulty of subduing objectionable high lights being one of the greatest hindrances to pictorial lantern-slide making. As a rule, lantern slides are made too hurriedly. It would be a far better plan to spend a long time and a lot of trouble over the making of one really fine slide, a slide which, when finished, would probably be a picture of first-class merit, and would give its producer pleasure whenever projected on the screen.

J. B. JOHNSTON.

PRACTICABLE PHOTO-MICROGRAPHY.

(Reprinted from the *Journal of Applied Microscopy*.)

OBJECTIVES AND CONDENSERS.—Scientific research in optics, improvement in optical glass, with gradual elimination of errors sometimes seemingly trivial to the ordinary laboratory worker, have made possible the present advances in photo-micrography during these more recent years, until we who are reaping the benefit of these improvements can photograph the most difficult objects with comparative ease, our obstacles being mainly those of technique in cutting and staining tissues.

Some manufacturers, who have been unwilling to sacrifice some pet theory, are still working to prove these theories, in spite of laws now well known and obeyed by those who have reaped that certain reward of obedience to law which is called by some "success"—by many, too often, "chance."

Those whose names to-day are recognised as worthy of honour and gratitude have worked almost unrewarded in many cases, and in the face of violent opposition.

Whether the front system of an objective consist of crown or flint glass, or be single or double, means comparatively little to the worker with an ordinary microscope; but these things mean everything to the photographer of microscopic objects, who needs all possible aperture suitable to the power used and all possible correction of spherical and chromatic aberration.

What wonders have been accomplished since Leuwenhoek, in 1672, published his observations of bacteria with a simple lens, a glance into any of our laboratories will show, but only partially, until some veteran worker proudly exhibits to you his favourite lenses, expatiating now on the lighting of the field, now the exquisite definition, keeping you till the wee small hours, until, after breathless manipulation of light and collar correction, he triumphantly shows the striations on *Amphiplexus pellucida*, or the nineteenth band of Nobert's plate.

The writer well remembers his first lessons as a boy back in the sixties, looking with awe and interest through the microscope owned by one of the pioneer physicians and scientists of the Western Reserve, the stand of the queer model of those days, a still queer French triple-lens with dividing fronts of varying powers, from one inch to one-quarter inch.

There were strange iridescent rings around the outside of the field and "dishing" of the object, which we now condemn as chromatic and spherical aberration.

The microscope and objective were made by a famous French optician, but our ordinary student microscopes of to-day far surpass them.

Since those days we have seen the advances step by step, in which our American opticians were always to the front in spite of lack of means and encouragement, and we do well to honour our Tolles and Spencer.

We have seen the colour fringes disappear, the field grow flat, and the aperture increased, until to-day our best dry lenses give better results than the water immersion lenses of that period.

Powell and Lealand in England, Hartnack and Nacher on the Continent, and Tolles and the elder Spencer in this country, were gradually improving their lenses until, in 1873, Tolles produced a fine glycerine immersion objective of 1·23 N. A.

But during this period further advance was checked by the false theory that all that was needed was "power" in order to see minute objects. Indeed, even to-day, almost the first question asked of the possessor of a microscope is, "How high will it magnify?" and, unless one claim at least 5000 diameters, the shoulders are shrugged, and no further interest is manifested.

Even in 1880, three years after the publication of Dr. Abbe's discovery of the diffraction theory, it was common to see $\frac{1}{2}$ -inch and even $\frac{1}{4}$ -inch objectives, and Tolles once made (although under protest) a $\frac{1}{8}$ -inch objective, and that to study a tooth!

Dr. Abbe's untiring labours were finally rewarded by the almost universal adoption of his theories, which, together with the equally zealous labours of Dr. Schott in optical glass, have practically revolutionised the science of lens-making, especially for photo-micrography, and Zeiss apochromatic lenses are within the reach of every earnest worker.

To-day we recognise the fact that the numerical aperture of an objective, and not its power, governs the definition, the limit for the practical worker being about 1·40 N. A. for an immersion objective, although Powell and Lealand in England and Herbert R. Spencer of this country are making $\frac{1}{16}$ immersion objectives of 1·50 N. A., and the famous Zeiss Company has made four $\frac{1}{16}$ immersion objectives of 1·63 N. A.; but these can only be used with special slides, cover glasses, and mounting media not accessible to the ordinary worker.

A single example will suffice from our own experience. A few years ago, while buying "everything in sight," we were tempted into purchasing a $\frac{1}{8}$ -inch immersion objective of 1·20 N. A. of a first-class maker; two years later a $\frac{1}{8}$ immersion objective of 1·35 N. A., by the same maker, was bought at a bargain, almost reluctantly; but we have proved many times, to our own and others' satisfaction, that the $\frac{1}{8}$ would resolve far more difficult tests than the $\frac{1}{8}$, although of only one-third its power.

The $\frac{1}{8}$ was long ago got rid of at a bargain to the purchaser; the $\frac{1}{8}$ still remains the gem of our collection, and unequalled in defining power by any we have seen of its N. A.

Still, the best objectives of fifteen years ago, although of sufficient N. A. and well corrected, failed in one very essential point for photography, viz., correction for various rays of the spectrum, lenses for visual work being corrected for yellow-green rays at one end of the spectrum, and lenses for photography corrected for blue-violet rays at the other end of the spectrum, and neither were well fitted for any but their own special work.

In July 1886 the Zeiss Optische Werke, under the guidance of Dr. Abbe introduced the apochromatic lenses, which simplify our work to a marvellous extent.

These lenses, while not necessary for ordinary work, possess two special essentials for photo-micrography, viz., "the union of three different colours of the spectrum in one point of the axis and correction of the spherical aberration for two different colours," thus eliminating secondary spectrum and securing sharp definition for all parts of the field.

A first-class achromatic objective by a good maker will give fairly good negatives of some objects if especially stained and the proper colour screen and plate be used; but if we are called upon to photograph objects which are unstained, with no contrasts, resolved with difficulty with diaphragm nearly closed, i.e., cilia in the bronchi or Fallopian tubes, then even with best of apochromatics we shall need all our technique and patience.

The writer has been the past two weeks fighting a specimen of a rare tumour on which a scientific friend is writing an important article, in which some considerable part of the success depended on defining and photographing a few striae on muscle fibres—unstained except nuclei, and cut with a freezing microtome at twenty micra.

The result was attained with a Powell and Lealand $\frac{1}{8}$ -inch apochromatic immersion objective of 1·40 N. A. with a condenser equally well corrected, Zeiss No. 3 projection ocular, 1720 diameters, light yellow screen, ortho plate, and five hours' exposure, and our best achromatic objective failed to yield any result.

Condensers have come to us in their present form about abreast with the gradual improvements in objectives, the English opticians and workers being the first to recognise their value, until now we realise that for the best performance of our best objectives the condenser should be as perfectly corrected and of almost the same N. A.

The ordinary Abbé condenser, even if of equal N. A. with the objective, introduces grave errors, as shown most lamentably in an otherwise fine photograph of *Amphipleura pellucida* reduced to dots with a Zeiss apochromatic 2 mm. of 1·40 N. A., used with an inferior condenser, by Fraenkel and Pfeiffer in their *Atlas of Bacteriology*.

Very good achromatic condensers are now made by the leading manufacturers, but the best we know of and use in every-day work are the Zeiss of 1 N. A., one of 1·43 N. A. oil immersion made especially for us by Spencer, and an apochromatic oil immersion of 1·40 N. A. by Powell and Lealand which gives pure images unexcelled by any we have seen.

By this time our unfortunate reader has begun to despair, and imagine that one must be a multi-millionaire to go in for photo-micrography; but we hasten to correct the impression, for four first-class objectives with an achromatic centering condenser make a fairly complete battery with a projection ocular.

The objectives should be apochromatic, if possible, a 24 mm. of not less than 0·30 N. A., a 12 mm. of 0·65 N. A., a 6 or 4 mm. of 0·95 N.A., and a 2 mm. oil immersion of not less than 1·30 N. A.

If all of these are not obtainable, we should say by all means choose the 12 mm. of 0·65 N. A. and the 2 mm. oil immersion apochromats, and the other perfectly corrected achromatics.

With such objectives and a good camera the best of work can be done by earnest workers.

The writer is well aware of the magnificent work done by the late Surgeon-General Woodward with Tolles and other achromatic objectives, having some of his photographs in his collection, and having more than once handled with reverent care the splendid collection of lenses at the

Army and Navy Medical Museum, including a $\frac{1}{8}$ -inch by Tolles, probably the first homogeneous immersion objective made.

But we are not all Woodwards, nor have we such facilities as he had, and he would have surpassed himself if he had worked with some of our present objectives.

We have in our own collection five of the best immersion lenses made, including a $\frac{1}{8}$ and $\frac{1}{16}$ of 1·35 N. A., and $\frac{1}{8}$ and $\frac{1}{16}$ apochromatic of 1·40 N. A., and a $\frac{1}{16}$ of 1·43 N. A.; also a full set of Zeiss apochromatic dry objectives, viz., 24, 12, 6, and 3 mm. of highest possible N. A.; but we use two of these 99 times in 100—the Zeiss 12 mm. dry apochromatic of 0·65 N. A. and the Powell and Lealand $\frac{1}{8}$ -inch immersion apochromatic of 1·40 N.A.

The 12 mm. Zeiss apochromatic of 0·65 N. A. is our most useful dry lens, being capable, with proper illumination, of almost any amount of magnification without breaking down, and gives a far better negative with No. 3 projection ocular at 1000 mm. camera extension than any achromatic $\frac{1}{8}$ or $\frac{1}{16}$ at the same magnification.

Any one can satisfy himself of this by making two negatives at 300 diameters with full cone of light, using this objective and any $\frac{1}{8}$ of any good maker, and the apochromat will reveal details of structure that are impossible to the less well-corrected objective.

In regard to condensers, our readers will remember that many objectives can be used as condensers; we have just been making some negatives of *P. angulatum* with 6 mm. apochromatic of 0·95 N. A., using the objective above named as a condenser.

We need also to sound a note of warning in regard to the other optical parts of the apparatus, lest some errors should creep in and offset the advantages of fine objectives and condenser.

The large collecting lenses on our optical bench, with cooling cell and ray filtering trough, should all be of best construction and glass, as also an achromatic lens for rendering the rays parallel before they enter the substage condenser.

This last-mentioned is of great value, almost a necessity for equally lighted fields.

With these conditions realised in all parts of our optical apparatus, we shall need only special methods of technique and experience. Of the former we may write later; the latter comes with time, oft with failure, but ultimately crowned with success.

CHARLES H. POTTER, M.D.

A TEMPLE OF SCIENCE.

AMONG the many museums and galleries, filled with the priceless treasures of past generations, with which Florence abounds, and which render the city of Dante a veritable Mecca alike to the artist and the student, perhaps none offers a greater interest to the scientific, and more especially the astronomical, visitor than that Temple of Science known as the "Tribuna di Galileo." This richly decorated hall, says Mr. W. Alfred Parr, in *Knowledge*, in which are worthily enshrined some of the most interesting and valuable scientific relics relating to the life and work of Galileo, and which vies in point of interest with the picturesque old tower-known as Galileo's Observatory, described by me in a former number of *Knowledge*,* forms part of the Museum of Physical Science, and was inaugurated in 1840, on the occasion of the assembly at Florence of Italy's principal scientific men. Dedicated, as it is, to the memory of the great Tuscan astronomer, it was but fitting that the structure itself, as well as the paintings, sculptures, and mosaics with which it is so richly adorned, should be representative of the best talent of Tuscany; and that the artists intrusted with the erection and decoration of this memorial to their illustrious compatriot succeeded in worthily acquitted themselves of their task may be seen from the accompanying photograph.

On every side are depicted interesting episodes in the life of Galileo, from the time when, as a young student, he watched the swinging lamp in the Cathedral of Pisa, to the time when, old and blind, and in the retirement of his villa at Arcetri, he dictated the account of his researches to his two celebrated pupils, Torricelli and Viviani; while in the centre of the apse, dominating the whole, stands Professor Costoli's statue of the great astronomer. The painting in the ceiling immediately above the statue, and plainly visible in the photograph [reproduced in *Knowledge* for May], represents Galileo in the act of demonstrating the merits of his newly constructed telescope to the assembled Senate at Venice.

Ranged along the walls are glass cabinets, containing many valuable instruments dating from the time of Galileo and his School; but it is in the two cabinets on either side of the statue that our chief interest

* See *Knowledge* for July 1899, p. 157. The tower is now the property of Count Paolo Galletti.

centers. In the one to the left of the spectator is preserved, carefully mounted in an elaborate hexagonal frame of worked ivory and ebony, the object-glass which Galileo fashioned with his own hands. This precious bit of glass, if one may believe the Latin inscription on the frame, afforded the great astronomer his first glimpse of Jupiter's satellites, and thus enabled him to announce to the world the great discovery which firmly established the Copernican doctrine, and which elicited Kepler's famous message of congratulation to his fellow-worker, parodying the last words of the Emperor Julian, "Galileo, vicisti!"* The little lens, barely an inch and a half in diameter, which sufficed to reveal the four "Medicean Stars" to the eyes of the "Tuscan artist," compares strangely with the great thirty-six-inch object-glass on Mount Hamilton, which, 282 years later, added a fifth member to the little group forming the Jovian system. Preserved in this same cabinet, and just discernible in the photograph above the frame containing the object-glass, are two of the first telescopes which Galileo is said to have constructed.

A somewhat gruesome relic of the great man is preserved in the cabinet to the right of the spectator. Mounted on a short marble pillow, adorned with the usual allegorical Latin inscription, is a crystal vial containing the index finger of one of Galileo's hands. It was severed from his body just before the latter was consigned to its last resting-place beneath the grand monument prepared for it in that Westminster Abbey of Florence, the Church of Sante Croce.

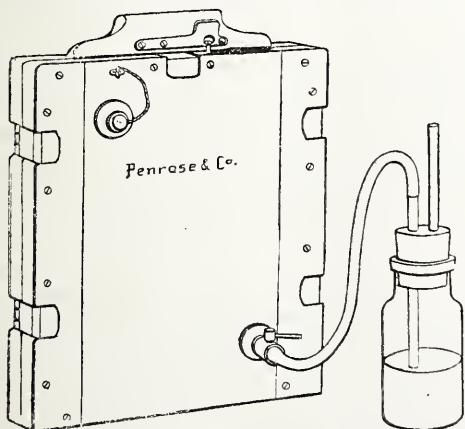
The remaining cases contain a valuable collection of astronomical, nautical, and geodesical instruments, formerly belonging to the Accademia del Cimento, the famous institution which, rising, as it were, from the ashes of Galileo, counted among its members such men as Borelli, Viviani, and Redi, and which chose for its motto the significant words, "Provando e Riprovando."

Some old telescopes with wooden "bodies," by Torricelli of Florence, dating from the year 1644, together with others in quaint leather coverings, embossed with curious gilt ornamentations, constructed by Campani of Rome in 1666, are also preserved here, and serve to complete a collection which, alike to the student and the antiquarian, is of absorbing interest throughout.

A DARK SLIDE FOR THE LIPPMANN PROCESS,

Manufactured and sold by Penrose & Co., 8 and 8a, Upper Baker-st., London, W.C. THIS Dark Slide has been designed for working the Lippmann process of photography in colours, and the construction follows the lines suggested by Professor Lippmann, with some improvements tending to greater compactness and security against leakage of the mercury. It has been used and commended by several advanced workers in this process.

Messrs. Penrose have furnished us with the following details:—The slide is slightly larger each way, and somewhat thicker than an ordinary



dark slide, and it only takes a single plate. It is made exceptionally strong to withstand the pressure of the powerful springs which made the holder mercury-tight. The essential feature of the construction is a steel plate, fitted at the back with a number of springs. To this plate are attached two tubes, passing to the outside of the slide. One is provided with a small stop-cock, to which is attached the rubber tube of the mercury bottle. The other is provided with a plug, and forms an air vent, which must be opened when the mercury is running in. The second tube of the mercury bottle also acts as an air vent when the

* "Galilean, thou hast conquered!"

mercury is returned to the bottle. On the surface of the steel plate is laid a frame of thick chamois leather, forming a margin of about $\frac{1}{4}$ inch width, and on this is laid the prepared plate, sensitised side downwards. There is thus a space between the steel plate and glass plate, which can be filled with mercury. In the operation of filling, the slide should be held vertical, and the mercury bottle held above the top of the slide. More mercury than is required to fill the slide should be contained in the bottle in order to get a good "head" to force the mercury up the slide. The flow must be steady and without intermission, or markings will occur on the plate. For the same reason the slide must be held steady.

A focussing frame is sent out with each slide, with the ground glass coinciding with the surface of the sensitive plate. Messrs. Penrose state that they cannot make their dark slide to match existing dark slides, which are generally much too small and light to compare with the Lippmann slide. It is usually best to adapt the latter to a camera next size larger.

Messrs. Penrose inform us that they have just supplied a half-plate slide to Dr. J. H. Smith of Zürich, who has succeeded in producing some successful plates for the process. Plates are also supplied by Cheret of Paris, and may be obtained through Messrs. Penrose.

THE "VOLO" DEVELOPING APPARATUS.

Manufactured and sold by George Houghton & Son, 59, High Holborn, W.C. THIS simple piece of apparatus should be of great assistance to those photographers who employ rollable film for negative work. Its applications and method of use are so obvious from the illustrations that very little description is called for. The printed instructions, however, may conveniently be quoted for the benefit of those not conversant with the principle of rotary development.

"Cut off from the spool the number of exposures that are to be developed, and attach the film, sensitive side outwards, to the wheel by means of a fixed clip, on the wheel. Pass the length of film round the



FIG. 1.

rims of the wheel, and attach the other end to a loose or sliding clip. Any number of exposures can be developed at one time up to the number that the wheel will take, as this clip is movable, and can be fixed in any position on the wheel.

Developing.—The film is now in position for development, and the wheel should be placed on the stand provided and revolved, the film passing through the developer with a gliding motion, which is most desirable for the avoidance of spots and streaks.

Fixing.—This can be done in the same manner as for developing, or the handle and axle can be removed, and the wheel, with film upon it, placed in a bath of hypo. With the aid of another wheel the operator can then proceed to develop another set of exposures.

"Washing."—This can be done by placing the wheel on the stand in a sink, and allowing a stream of water from a tap, preferably fitted with a rose, to play upon it, causing the wheel to revolve, as shown in fig 1; or, if preferred, the handle and axle can be removed, as explained before, and the wheel placed in a bath of water.

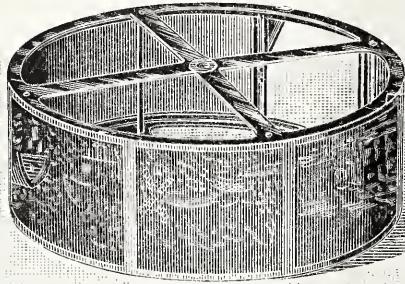


FIG. 2.

"Drying."—The wheel can be placed on its side, (Fig. 2), and the film left until dry, when it can be removed and cut up for printing."

When we inspected the Volo we were much struck by its ready adaptation to rollable-film manipulation, and we have little doubt that it will secure a considerable degree of appreciation.

SOME REMARKS ON LIGHT AND LIGHTING.

To enumerate them ultitidinous systems of lighting for studio purposes as applied to the photographic art would indeed be a hard task. I suppose every operator has his own special ideas as to producing certain effects which he or any one else may call "artistic." The lighting for one sitter is, or perhaps ought to be, quite different to that of another, and there is no doubt the student of posing and lighting does his level best to produce this variety. There is, however, a kind of limit in most cases, which will, upon a little thought, become apparent. The lighting which best suits the face becomes inappropriate to the dress, which may have heavy folds or a quantity of dark-coloured lace or other trimmings. You get the light so arranged that you observe the delicate embroidery or trimmings of the dress, but then the complexion would be ruined, the character of your sitter would be lost, and instead of a nicely modelled face you produce a mere eyes, nose, and mouth, but a very pretty and delicate dress effect. Such is one of the troubles to be met with in studio lighting. Another, and one not unseldom met with, is the lady or gentleman with white (grey) hair, which has a great tendency to get over-exposed, whilst the somewhat ruddy complexion hangs back, so to speak, and you wonder

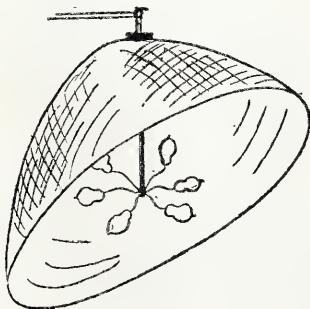


FIG. 1.

if there is really any means of getting a reasonable result without having to resort to isochromatic plates. Then, again, we have the red—yes, decidedly of a strong non-actinic tint—hair, and our old-time friends' faces covered with non-actinic spots, or better known as freckles, which require our retoucher to go so carefully over his or her negative; but, still, we have much to be thankful for, inasmuch as nature has been very considerate in making these the exception and not the rule. Now, these colour cases are best dealt with (if it is worth your while) by the use of those modern inventions of colour filters and plates, as I firmly believe much better work can be done and time saved in the after-operations of faking the negative. Take the case of red hair. We might require the exposure considerably prolonged to get a reasonable effect from the hair, and that would mean over-exposure for the rest of our negative. A colour filter which will give the hair a more neutral tint will also have the advantage of prolonging the exposure for the dress, hands and face, and of thus getting rid of the violent contrasts which stand in our way, and I suppose it would not be difficult to find the sitter whose inappropriateness to a bright clear light would be at once seen had he or she (generally she) come on a dull or hazy morning; or, again, the sitter whose combination

is such that an evening exposure of twenty seconds would produce better results than a middle-day exposure of one second.

I believe the careful operator has all this sort of thing in his notebook; but, still, he has to face these difficulties from day to day, and do the best he can under the circumstances which limit his operations. How much better it would be if he had some means of changing the whole of his light to the tint required. This, however, would be a very difficult thing to arrange; but, still, these are little suggestions which might be utilised in some cases. One might have a number of hoops, upon which could be stretched various tinted gelatinates suited to the colours of dress or complexion, and these could, when occasion required, be placed against the principal source of light, and so moderate or control the source of light falling upon the sitter. I think it is fairly admitted that exposure is the principal factor in producing an effective gradation or contrast in a negative, and not any arrangement of development; although one may modify, one cannot altogether compensate for bad exposure. A correct exposure, therefore, means success, and a correct exposure cannot be given on two or more colours (blues and yellows or reds, or modifications of same) without some special plate or filter. Colour-sensitive plates have been on the market now for some time past, and have been used largely for landscape and copying purposes, and there is no reason at all why a more popular use might not be made of them in your studios. The colour filters which are made, or can be made, very conveniently to fit the lens, may be used when focussing, and so the operator can see the modification produced. As a rule (violent colours not being very much worn), very light tints would be sufficient for portrait work, and a set of filters would not be a very formidable task.

Whilst on the subject of light and lighting, I would like to say a word or two with reference to a system of lighting brought out and perfected for all practical studio work by Messrs. Adamson Bros. Many photo-

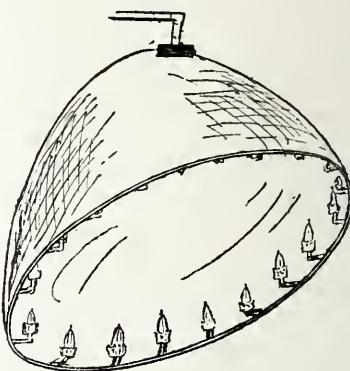


FIG. 2.

graphers who are entirely dependent upon daylight, and constantly have sitters coming late in the evening, would do well to give artificial light a trial. I speak more generally to provincial photographers, and would remind them that there are London photographers who never use daylight at all.

I was in a studio a short time back just off Cheapside, E.C., and, on being shown up, was surprised to find what would have made a better dark room than a studio, until the daylight was let in through, I believe, a solitary window, and the artificial arrangement demonstrated. I do not think I am in any way misleading when I say that some of our very best West-end photographers are using electric artificial lighting for portrait work. This generally consists of one or more large parabola-shaped reflectors, with a number of incandescent electric lamps in its focal centre, the direct rays being shielded by a small diffusing screen; or the lamps are arranged around its outer edge just within the bowl or parabola. The accompanying rough sketch may assist. Here fig. 1 is arranged for lighting large backgrounds of from twelve to fifteen feet, whilst fig. 2 is for all ordinary purposes—so far as a provincial photographer requires, or, indeed, any photographer—used for small groups and portrait work in general. An apparatus of this description gives one an immense advantage. The source of light can be moved to any point of the studio—a regular and constant factor of exposure; sitters are accommodated, no matter what the weather be, and a good negative available even after dark. This apparatus is always ready for use, and one I had the pleasure of testing, supplied with ordinary house gas, is one to which a rubber tube is attached at its base, and fills up from any ordinary gas-bracket or burner, without having recourse to the main. You just quietly press a small lever for two or three seconds and make your exposure; as you release your lever, the apparatus immediately refills. The cost of an exposure is one-third or one-half a cubic foot. I may just add that the makers have a special mantle constructed for them as used in this apparatus, which seems rather inclined to melt than break, so that the wrecking of mantles is reduced to a minimum.

F. G. WILLATT.

MONTHLY SUPPLEMENT

[TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."]

[July 6, 1900.]

THE LANTERN RECORD.

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LANTERN MEMS.

HE cinematograph has now established itself as a scientific assistant, and animated photography has become a necessity for the recording of natural phenomena as well as historical events, fashionable functions, and pastimes. Mr. Cecil Hepworth has been fortunate in securing a continuous record of the various phases of the recent total solar eclipse, and, on his return from Algiers, has not been slow in giving the public the opportunity of seeing, as near as possible, a lifelike representation of the wonderful sight that comparatively few of the scientifically interested were able to see usually.

* * * * *

THE London Hippodrome now show nightly this interesting film, as well as many others in connexion with the war in South Africa, and the appreciation of this and other entertainments at this place of amusement is proved by the fact that at eight o'clock the other evening, when I went, every seat in the house had been sold. The building, the area, and stage are all well arranged, and the general excellence of the company leaves little to be desired. The electric lighting and coloured lights are especially fine. The wonderful exhibition of the performing lions and the marvellous nerve of the trainer were things which those amused by the sensational could not fail to be pleased with. One lion among the beautiful specimens of Leos was so decidedly snarlish that I expected at any moment to see him spring on his keeper, and I could not help thinking what a wonderful thing "will power" and *sangfroid* is.

* * * * *

A LITTLE mental reasoning carries one away from the animal world to human beings, and examples soon come to one's mind of men who are successes in life because of their will power and determination, and others, far more clever either mentally or mechanically, are failures because they never know their own worth or know how to assert themselves at the proper time. This applies as particularly to the photographic and optical lantern business as to other departments of trade; and many a man deserving of a fortune is content to rub on with a paltry or moderate income because he has not had determination or *nous* enough to get the value for his labour or brainwork at the proper time.

* * * * *

MANY things that occur to me lead me to these conclusions, but it is difficult, without treading on dangerous ground, to give examples or particularise; so I must leave it to my readers to weave round

the instrument or apparatus they possess, or are interested in, the legend, history, or probabilities as to its origin and development. "Many grand schemes from little causes spring" may be allowed as a paraphrase of the well-known quotation. Those that come to my mind first are the daylight changing sensitive film, and the conception of rapidly moving figures in an optical lantern. The result of the first means millions of pounds, in which the public who have capital invested reap a good return, and the users of them have a vast amount of pleasure without any toil or technical difficulty.

* * * * *

WHAT about the pioneer? One would like to know how much the man who first thought of backing a sensitive celluloid or paper film with a light-tight paper got out of the conception, or what return those who spent hundreds of pounds to make pictures move at more than eleven per second, after taking photographs at a greater speed than that, were able to place to their credit before the man came along with an "improvement" that enabled a syndicate or company to make it commercial.

* * * * *

THIS word "commercial" means in trading what tact does in diplomacy and professional work. The veriest dunce, if he has tact, can pose for a time as the most learned, but, of course, in the end the lion's skin is blown aside, and the asinine form is revealed in broad daylight.

* * * * *

As long as I can remember, those who desire to educate or improve their fellow-men have written sage advice and done their level best to expose imposture; but, notwithstanding this, a large proportion of the fraternity are still open to be gulled, hence the fine time that those who are particularly "slim" in business have. Look at some articles in shop windows, without specifying what trade or kind of establishment, that offer second-hand goods for sale, and many of them ask, when wear and tear are taken into consideration, the price a new article could be bought for. In some instances I have seen things I do know about, say, optical instruments, priced as second-hand higher than the original retail price. To purchasers of second-hand articles I say, Be sure you have what is reasonably suitable for your requirements, and that it is in such a condition that you will not have to spend much money in putting it in good working order.

* * * * *

THINKING of the optical lantern, I was trying to apportion the honour or praise due to the various improvements of this much-used apparatus, and, remembering the oil and limelight lanterns as I knew them over thirty years ago, I called up in my mind's eye how the matter has progressively developed. First, the plano-convex achromatic lenses in combination of pairs replaced the old meniscus single lenses in combination, to be followed later by what the Americans largely adopted, the form of lens known as the photographic or Petzval lens. This, first of all, was of small diameter and comparatively short focus, but later British exhibitors followed the example of our American cousins and used large-diameter and long-focus

lenses. The general change in the form of front lenses came in with the adoption of the sciopticon form of lantern, so that two or three-wick mineral oil lamps could be used, and then the change was confirmed by the introduction of Dallmeyer's lantern lenses and condensers. The various mechanical details of the lantern and the metamorphoses, so to speak, of oxyhydrogen jets I shall have to refer to another time.

* * * *

A CONTEMPORARY reports the capture of a luminous crab by a dredge of the Zoological Society of Calcutta in the Indian Ocean, about a mile off the coast, and forty-five fathoms deep. It is nearly two feet in diameter, and its longest claws are about a yard in length. It has projecting eyes like those of a lobster, and is very voracious. It was put into a tank of sea water, and in two hours devoured some fifty other crustaceans and fishes. When darkness came it proved phosphorescent, emitting peculiar white rays and illuminating the whole tank. The crab was sent to the aquarium at Calcutta.

* * * * *

THE latest fad in Paris is the substitution of cinematograph pictures for menu cards, says *Morriss's Trade Journal*. Each course is preceded by a moving picture thrown on a screen.

* * * * *

THE Exposition of "Life in the Royal Navy" concludes its stay at the Polytechnic, London, on July 7 next. The crowded audiences that have visited it each day for the past nine months, and the keen interest and enthusiasm that has been shown during the presentation of this series of animated pictures, warrant one in strongly advising those who have not as yet been able to witness it to take advantage of the remaining two days of its stay at the Polytechnic. I understand that Messrs. West intend to open again in London, during the forthcoming winter, with some new scenes of naval life of still greater interest, and that they are arranging to send this Exhibition to Australia and our other colonies.

G. R. BAKER.

THE PENETRATION CO-EFFICIENT OF DRY PLATES FOR LIGHT.

IT is a well-known fact that the rays of light do not entirely lose their actinic properties when passing through a film of gelatino-bromide of silver; that, moreover, a part of the rays goes through unchanged, and by reflection from the back of the glass makes itself unpleasantly obvious in the form of halation. In what proportion, however, the light is absorbed by the ordinary films of dry plates, has, to our knowledge, not yet been determined,* and, in order to ascertain this, experiments were instituted to find out through how many films actually a ray could still be detected. Glass plates were, for this experiment, on account of their thickness, obviously excluded. The gelatino-bromide films of the Anilinfabrik, Berlin, which from their good qualities were specially suitable, were used, and six films were placed one over the other and exposed under a sensitometer of from one to sixteen layers of tissue paper, for 120 M.K.S. (candle meter seconds). The sensitometer had such thickness that a very sensitive commercial plate with an exposure of 120 M.K.S. just allowed the number 16 to be read on development.

The films were exposed so that the first received a full exposure, and the second received the unused light which passed through the first, and so on. All the films were developed simultaneously in a dish with rodinal 1:30 for four minutes. The following numbers were legible.

Film No. 1.	Sensitometer No 15.					
" 2.	" 11.					
" 3.	" 8.					
" 4.	" 4.					
" 5.	" 7.	Distinct, but not legible				
" 6.	" 0.	[after fixing.				

The lower films showed a faint general fog, in consequence of

the light diffused by the films in the packet. The sharpness of numbers becomes as a matter of course, less sharp with each succeeding plate.

In order to express numerically in M.K.S. the light which was absorbed by each plate, a large number of films was exposed at the distance of one metre from the candle, and for various times of exposure, which were measured with a metronome, and then reckoned out in seconds. After development, which was accurately carried out as before, the plates were picked out which corresponded to the plates carrying the numbers 2 to 4. For example, to obtain the number 11 as the last as in film No. 2, an exposure of 33·3 seconds had to be given. The following table shows the exposure numbers found and the value reckoned according to rule:—

Film.	Light found.	Light reckoned.
No. 1	120 M.K.S.	120 M.K.S.
" 2	33·3 "	33·3 "
" 3	9·4 "	9·25 "
" 4	2·6 "	2·57 "
" 5	— "	0·71 } below the inertia
" 6	— "	0·2 } of the plate.

The numbers form now a geometrical series. Each film absorbs $\frac{1}{18}$ of the incident light, and transmits $\frac{15}{18}$. The absorption-coefficient of the films tested is thus $\frac{1}{18}$ (0·722) and the transparency or Penetration-coefficient $\frac{15}{18}$ (0·278). If the first film has transmitted $\frac{15}{18}$ of 120 M.K.S. = 33·3 M.K.S., the second will transmit $\frac{15}{18} \cdot \frac{15}{18} \cdot 120 = (\frac{5}{18})^2 \cdot 120 = 9\frac{25}{18}$ M.K.S., and it will be seen that the calculated value corresponds very well with the observed result.

If thus the first film transmit $\frac{1}{a}$ of the total quantity of light, the second transmits $\frac{1}{a^2}$, and the third $\frac{1}{a^3}$, and the n th $\frac{1}{a^n}$. These coefficients were found with the films of Smith, Austin Edwards, and Kodak.* From this it follows that most commercial gelatino-bromide plates have approximately the same properties.

The point is now to deduce the penetration coefficient from the recognised conditions with dry plates. These conditions are, according to the experiences of several years, approximately the same with all large dry-plate factories. There is to be taken into consideration here, principally, the thickness of the film, which, with machine coating is 0·035 mm., and the ratio of the weight of silver bromide to the gelatine, which is usually 1 : 1·5. For the absorption, however, the ratio of the weights does not apply, but the ratio of volume. This is given by dividing the absolute weight by specific gravity. If we assume, now, the specific gravity of silver bromide = 6, and that of gelatine = 1·3, we find in the emulsion the volume of silver bromide to 7 volumes of gelatine. Therefore a surface of 8 sq. mm. is covered with 1 sq. mm. of silver bromide and 7 sq. mm. of gelatine.

The silver bromide grain of a good emulsion has a mean size of 0·0035 mm.; there can thus, in a film of 0·035 mm., ten grains lie one over the other. If we consider that the complete gelatino-bromide of silver film is divided into ten films of 0·0035 mm. each, each film will contain one grain of silver bromide and seven equal-sized grains of gelatine. The outer film will absorb about $\frac{1}{8}$ of the light incident on a surface of eight grains and transmit $\frac{7}{8}$. The second film again transmits $\frac{7}{8}$ of $\frac{7}{8}$ or $(\frac{7}{8})^2$, and the tenth $(\frac{7}{8})^{10}$. If this value is reckoned out, it will be found to be 0·26, and this agrees very well with value $\frac{1}{18} = 0·27$, found as above described. And the calculation corresponds to the actual ratio. The penetration coefficient of a gelatino-bromide of silver film appears to be dependent on the thickness of the film, on the size of the grain, and the volume ratio of silver bromide to gelatine.

If v = the volume of the silver bromide, v^1 = the volume of the

* According to Abney, *loc. cit.*, the light transmitted by the first film that acts on the second is 22 per cent., and that on the third film only 3 per cent., that on the fourth only 1 per cent., and that on the one-fifth only 0·5 per cent., and no useful light penetrates through the fifth film.—EDS.

* The author seems to be unaware of the paper on this subject by Captain Abney (*Camera Club Journal*, November 1899).—EDS.

gelatine, d = the thickness of the film, and k = the size of the silver bromide grain, the penetration coefficient is

$$\left(\frac{v^l}{v+v^l} \right)^{\frac{d}{k}}$$

From the experiments first described one can also reduce an estimated value of the inertia of a dry plate, that is to say, the time which one must at the most expose a plate to light without the formation of any light impression which will be visible after development and fixing.

It was proved that the light penetrating through the fourth film was so weak that the number 1 of the sensitometer was scarcely visible, and completely disappeared in the fixing bath; the light therefore which had penetrated through the fourth film must be looked upon as the inertia. If the penetration coefficient was estimated at $\frac{5}{18}$, there penetrated through the fourth film $(\frac{5}{18})^4 \cdot 120$ M.K.S., and, if $(\frac{5}{18})^4$ is reckoned out it is approximately $\frac{1}{120}$, and therefore through the fourth film penetrated $\frac{1}{120} \cdot 120 = 1$ M.K.S.

As the sensitometer was made of a sheet of glass, and this laid on a sheet of glass in the printing frame, the light had to penetrate through two sheets of glass and one thickness of tissue paper of No. 1 of the sensitometer before it reached the film. It is thus possible to expose a very sensitive plate under two sheets of glass and one thickness of tissue paper to a naked candle at a distance of one metre for one second without any noticeable fog being produced. At a distance of two metres the plate can be exposed for four seconds, and at five metres for twenty-five seconds without any harm. With quick manipulation and a light source sufficiently removed, it is thus very well possible to change dry plates with a naked candle flame, as has already been pointed out by Captain Houdaille (*Bull. Soc. Franç.*, 1894, p. 536) and Captain Abney (*Practical Photographer*, 1895, p. 250).

J. GAEDICKE.

THE MACKENZIE-DAVIDSON STEREOSCOPIC FLUOROSCOPE AND MERCURY BREAK.

MANY attempts have been made during the past two or three years to obviate the difficulty which perhaps more than any other has prevented the full use of X rays in medical work. This is the fact that on the fluorescent screen and in the X-ray photograph the image is flat, and, in the absence of the third dimension, it is impossible accurately to locate a foreign body or an injury to a bone.

Stereoscopic photography and "localisers" of various forms are frequently employed with more or less success, but both of these take a considerable amount of time and experience to use, and in practice are only employed in a few special cases by some operators. It is evident that, if the object could be seen with the fluorescent screen in stereoscopic relief, so that one could tell at a glance that a foreign body was, say, one inch from the surface, the gain would be enormous, as a surgeon, seeing the object in its actual position and its true anatomical relations, could afterwards operate with absolute certainty. Mr. Mackenzie-Davidson has fully accomplished this in his stereoscopic fluoroscope, which is so arranged that it can be used with an ordinary coil and batteries, and so can be added to any X-ray outfit.

So accurate and so easy to utilise is the stereoscopic image produced by this apparatus that, if a bullet be hidden in a loaf of bread, the operator can, while observing the image, insert a probe into the loaf, and make contact with the bullet at once, or can insert forceps and extract the bullet.

The facility with which this can be done, the bullet being found always at the first trial, is due to the fact that the probe is also seen in stereoscopic relief at the same time as the bullet and loaf.

The instruments consist of a rotating slotted disc and a double mercury make and break, these being driven synchronously by an electric motor.

Two X-ray tubes are used, the double break illuminating them alternately.

The makers of the instrument are Messrs. Newton & Co., 3, Fleet-street, London, E.C.

Dr. Mackenzie-Davidson's new mercury break is constructed to work with any coil and any voltage, but is specially efficient with high voltages.

It is so arranged that it will work a coil with 12-volt or 100-volt current, and yet will admit of full saturation of the primary in each case. The effect in X-ray work is very marked. Using 100-volt current with this break on the ordinary 10-inch Apps-Newton coil, an adult's knee takes about ten to fifteen seconds to photograph, and other portions of the body in proportion, so that, by its use with high voltages, the time of exposure is greatly reduced.

Again, when used with the fluorescent screen, the make and break are so rapid that there is no flickering whatever visible, and the brilliancy of the screen is greatly increased.

The nature of the spark produced is similar to that of the Wehnelt break, with this important difference, that it is absolutely under control and can be increased or diminished at will. It also entirely does away with the irregularity of the Wehnelt break caused by the unequal size of the bubbles, as the time of make and break with this instrument is absolutely regular at all speeds. It can be used with any coil, and is a most desirable addition to any X-ray outfit, for the following reasons:—

Time of exposure for X-ray photograph is greatly reduced.

The brilliancy of the image on the fluorescent screen is greatly increased.

Flickering of the image on the fluorescent screen is entirely done away with.

Direct currents of high voltage from the main can be used.

It forms, indeed, the most efficient make and break yet designed, while the simplicity of construction is such that there is nothing to get out of order, and the cost of production is comparatively low.

The makers of this instrument are also Messrs. Newton & Co., 3, Fleet-street, London, E.C.

THE MAKING OF AN ANIMATED PHOTOGRAPH.

MESSRS. HEPWORTH & CO., of Walton-on-Thames, are issuing a little book treating of the making of animated photographs. It is well printed and produced; the illustrations are good half-tone blocks from good original photographs, and the letterpress is interesting and clearly compiled.

One or two extracts may be of interest to our readers:—

The cheerful amateur, with his hand camera, who is used to developing quarter-plate negatives, and thinks himself endowed with almost superhuman genius—not to say foolhardiness—if he develops as many as four in one dish, will ask how can it be possible to develop a strip of film 1½ inches broad and 50 feet long, without producing, as the result, a hopelessly blotchy and mottled film? Visions of big tanks filled with developer and other chemicals, with these big masses of film tangling and writhing like so much seaweed, will rise before his mind's eye, and he will be further mystified when he learns that, at the factory with which this booklet is concerned, they are in the habit of handling film of forty times this length, or 2000 feet, in one piece. But that is not all, for when the perfect negative is produced there is much to be done before a print is ready for use in the projection cinematograph. In the first place, a positive print from the 50 feet negative is required, and a moment's reflection will show that every picture must absolutely coincide with the perforations upon the edges of the film, exactly the same as in the negative, if the projected scenes are to register with one another with that exactitude which is necessary to give the illusion of continuity. These perforations are the means by which the mechanical arrangement jerks the film through the machinery step by step with absolute exactness, and a single hair's breadth of deviation from accurate registration between one picture and the next would mean a jump upon the screen of a foot or more. Then, of course, the positive print, which is made from the negative by the action of light, must in its turn pass through all these processes of development, fixation, washing, and drying, before it can be rolled up and handed to the exhibitor.

The Negative.—A cinematograph camera is simply an ordinary photographic camera on a very small scale, with a mechanical contrivance added, whose duty it is to draw the film in a series of jerks past the lenses. Every time the film comes to rest behind the lens a shutter uncovers it for a moment and covers it up again. In that moment one picture is taken, and the mechanism moves the film on to the next position; then the lens is uncovered again, and another impression made, and so on, the operation being repeated twenty times in every second until the film is finished. Messrs. Hepworth & Co., at their factory at Walton-on-Thames, have several of these cameras always in readiness, charged

with film, for any photograph which is to be taken, and their operators through the summer are continually coming and going, bringing into headquarters the exposed negatives which they have procured on their travels. Then, too, there is an excellently fitted and thoroughly complete stage, erected in the open air, where small dramas are enacted for the benefit of an audience of one—a cinematograph camera—but of this we shall have more to say later. For the present, let us suppose that an operator has just returned with a valuable film representing some subject of great interest to the public, who will expect to see it upon the screen at their favourite music-hall on the same evening. The film is taken immediately to the dark room in order that the latent image upon its surface may be developed into a finished negative. In the early days of animated photography the methods of handling such a film were very crude and unpractical, although, indeed, such methods, somewhat amplified, are still in use among the more conservative of the early workers. In the dark room, according to the old *régime*, the film would be wound upon a large drum, which was successively revolved in several troughs containing the different chemicals. Or, by a similar but still less satisfactory plan, the film would be stretched upon pins projecting from each of the four arms of a frame in the form of a cross, and the whole submerged successively in the different chemicals. It will at once be seen that the difficulties of producing an equally developed negative by these means are very great, to say nothing of the obvious disadvantages of being restricted to some definite length of film; for cinematograph pictures nowadays are very often taken upon a pellicle, hundreds of feet in length, and, by the crude methods suggested, such films would have to be cut up into shorter lengths, which would then be treated separately. But in the factory under consideration all these crude implements have been swept away, and their places taken by specially designed machinery, which is open to none of these objections.

The Developing Machine.—The spool of film, which has just been brought in by the operator, is placed upon a spindle at one end of this machine, and by purely mechanical contrivance the film is gradually drawn first through the developing solution, which is contained in a long trough running throughout the length of the room. As the exposed film passes slowly along this trough, it can be examined by the operator in charge, and the process checked the moment it is completed. The whole length of the film goes under his observation, and any portion which requires different treatment can have it without detriment to the remainder. Then the film passes through running water, removing all traces of chemicals, and is once more drawn—still by the same machinery—through another trough containing the fixing solution. After that a lengthy washing awaits it, before the machine urges it in turn through each of the other chemicals which remain to complete its evolution. Finally, it is received upon another large spool, and the completed film is taken into another department to be dried.

The Drying Rooms are well-ventilated rooms, varnished on walls and ceiling to minimise the risk of dust, and sufficiently and thoroughly warmed by gas-stoves. Near the ceiling run a number of parallel horizontal wires, on which are strung hundreds of wire hooks, and from these hooks the film depends in long festoons, reaching almost to the floor. After a simple preliminary blotting process, whereby the surface moisture is removed, the film is hung in these festoons and dried, and each room is capable of accommodating between 2000 to 3000 feet of film. The rooms are fitted with several electrically driven fans, and, owing to the carefully considered system of heating and ventilation, and the constantly moving atmosphere, negatives can be dried in a very short space of time, and in the case of our imaginary picture, where speed is so essential, all possible precautions would be taken to hasten the drying process.

The production of really popular cinematograph pictures is daily becoming a matter of greater and greater difficulty, for, whereas in the early days of the art people were well content to be shown photographs of railway trains, steamboats, and street scenes, and the easily got pictures of that kind, they are nowadays far more particular, and will not accept anything which is not of a distinctly novel or startling nature. To supply this ever-increasing demand, Messrs. Hepworth & Co. send their operators further and further afield in search of novelty, and those who remain at home are continually preparing and executing miniature dramas for the amusement and entertainment of their patrons. Upon a well-furnished stage in the open air these dramas are enacted, after careful and elaborate rehearsal, amid all the requisite surroundings of scenery and accessories which the subject demands. In fact, quite an important branch of the business is continually occupied in the painting of scenery, the construction of "properties," and the manufacture of dresses and costumes for these short comedies. The camera

forgets nothing and notices everything, and the scenery and all accessories must be just as carefully prepared for a play which has a run of one performance only, and that lasts but a single minute, as if a three hours' entertainment were contemplated in the hope of a run as long as that of *Charley's Aunt*. There is a little staff of actors within easy call, who rehearse again and again until they are proficient in their respective parts for each of their playlets, and the spectacles to be seen on this miniature theatre are by no means confined to the simple comedy or farce. Various strange and startling effects can be produced by photographic and mechanical manipulation, and the most startling transformations and appearances may be brought about by comparatively simple means—effects as weird and unaccountable as any of those attributed to the wonder-workers of old.

Another increasingly important branch of the business is the production of animated photographs exclusively for advertisement purposes, and here again the *al-fresco* stage is called into requisition. The motto, "Animated photographs are the best advertisement," is already an accepted truth by the few who have put the matter to the test, and it will not be long before its truth is far more universally recognised. When it is remembered that hundreds of pounds are sometimes paid for a single picture to be turned into a poster advertising "somebody's soap," and the immense popularity which such a picture has obtained, it will readily be seen that, could that poster be suddenly brought to life, and endowed with animation and movement, the value as an advertisement would be increased very many times. The stage is, of course, principally used for the production of interior views, and, as the premises of this firm are surrounded by very varied and beautiful country, it is almost always possible to find some situation which offers natural scenery suitable for most requirements where exterior views are necessary. Needless to say, a woodland scene, if carefully selected, is very much better for photographic purposes than any painted representation of the same view could possibly be, and an open field or hill-side scene can be far better rendered by going direct to nature than by calling in the aid of the scene-painter's brush.

THE ECLIPSE OF THE SUN.

MR. MAUNDER, in the current number of *Knowledge*, describes an observation of the Total Solar Eclipse, 28 May, 1900, which yielded unexpected results. He says: "Mr. Evershed conceived a bold plan, which proved successful in all but one vital point, for which indeed Mr. Evershed cannot in any way be held responsible. Forsaking the central line with its many seconds of totality, he took his station near the edge of the shadow, where, as he hoped, his total phase would be reduced to some 20 or 25 seconds. His object was twofold: to get a rolling or grazing contact of the limbs of the sun and moon whereby the 'flash' would be given out all along the osculating surface, and to get the 'flash' not near the sun's equatorial regions, as do the observers on the central line, but at the sun's pole. Thereby it may be judged whether the constituents of the sun's surroundings vary with their solar latitude. In addition he used two large prisms in conjunction with a large reflector. Mr. Evershed found himself, when the shadow passed, about one hundred yards outside it, and not, as he had hoped, two miles within. Though actually outside the total phase, he got some photographs of the 'flash' of most exceptional beauty, but probably not one-fourth of the result which he would have got had he had more accurate values for the position of the shadow track. In another way his experience is of very great value, though not by any means in the manner he intended or desired. The farmers and sightseers in his near neighbourhood had a vehement discussion as to whether the eclipse was total or not. They divided themselves into two parties, those who saw the sun completely disappear, and those who described the corona as creeping round to the moon up to a point where there was a small remnant of sunlight. It got as far as this point but no further, and straightway began to creep back again and vanish. These latter also spoke of the sharp dividing line of light and shadow which sped across the Mediterranean to their left hand. The division was, or appeared to them to be, bordered by a bright line. Investigation proved that both the parties were in the right, for they had been separated by some five hundred yards, the line of total phase passing between the inner party and Mr. Evershed's tent. This unique observation affords a most accurate datum to correct the computation of solar eclipses in the future. It is a pity, however, that such an observation should have been at the expense of Mr. Evershed's special researches."

SOURCES AND PROPERTIES OF BECQUEREL RAYS.

[Reprinted from *Nature*.]

In the following article a general account is given of a few of the more striking phenomena connected with Becquerel rays, including some of the recent developments of the subject at the hands of Becquerel, M. and Mme. Curie, and others.

Among a large number of papers which have lately been published, dealing with properties of these rays, two are worthy of especial notice, giving a comprehensive view of the phenomena. For those who propose to study the subject more fully, no better guide can be found than Professor Elster's report in Eder's *Jahrbuch für Photographie und Reproductionstechnik* for 1900. The foot-note references to original papers form a complete bibliography of the literature of the subject existing at the time when the article appeared, and it is surprising that Professor Elster should have succeeded in summarising so large an amount of matter in eleven very small pages. Dr. B. Walter's article in the *Fortschritte auf dem Gebiete der Röntgenstrahlen* is somewhat less condensed and more popular; the chief phenomena, especially the photographic and fluorescent properties, are dealt with at greater length, and the article is illustrated by a plate of radiographs showing the difference between the actions of Becquerel and Röntgen rays. Already Walter's paper, and, to a less degree, Elster's report, have become out of date on the subject of magnetic deviation, and for this and other later developments no better guide could be found than the well-condensed summaries contained in the current monthly parts of *Science Abstracts*.

The discovery of these rays in 1896 was a natural sequence of the discovery of the Röntgen rays, and was led up to, on the one hand, by the attempts of M. Henry to intensify the action of Röntgen rays by the use of phosphorescent substances; and, on the other hand, by the theory, once abandoned, that the Röntgen rays were themselves the result of phosphorescence of the vacuum tube. Becquerel and other physicists made numerous experiments to test whether phosphorescent substances emitted rays capable of acting on a photographic plate that was enveloped in opaque paper, and it was found that rays which produce actinic action were emitted by the phosphorescent salts of uranium, not only when these salts had been exposed to the action of sunlight or of Röntgen rays, but, even after they had been kept in the dark for months, the "radioactivity" showing no perceptible falling off.

POLONIUM AND RADIUM.

The next step was the discovery by Mme. Curie, that Bohemian pitchblende—a black, shiny ore of uranium—possessed a higher degree of radioactivity than uranium itself, and this result naturally suggested the view that the ore contained, besides uranium, some other substance to whose presence the increased action was due. By separating the pitchblende into its constituents, M. and Mme. Curie were led to discover the existence of two sources of radio-activity, one associated with the compounds of bismuth, and the other with those of barium occurring in the ore. Seeing that barium and bismuth obtained from other sources do not emit Becquerel rays, these radiations were attributed to the existence of two new substances, that associated with bismuth being named polonium, name derived from the Polish nationality of Mme. Curie, while the other substance associated with barium chloride was called radium. The separation of these two substances has led to the production of rays of sufficient intensity to excite fluorescent screens, discharge electrified conductors, and, indeed, to reproduce, with differences, most of the properties of Röntgen rays. A third radio-active substance, produced from the residues of pitch-blende, is recorded by Debierne, who names it etinium. It is precipitated by the principal agents for titanium, and it emits rays which reproduce the same phenomena as the rays emitted by radium and polonium, and are 100,000 times the intensity of ordinary uranium rays. Certain thorium compounds are also radio-active, a property first established in these by G. C. Schmidt and Mme. Curie, and subsequently investigated by R. B. Owens and Rutherford.

Since this article was in the printer's hands a paper by Sir W. Crookes on the radio-activity of uranium, read before the Royal Society on May 10, has been received. The author records an entire absence of radioactive effects in all the barium minerals in his cabinet from which uranium was absent, while pitchblende and other minerals containing uranium and thorium excited a photographic plate. Arrangements were then made for working up half a ton of pitchblende, and the radio-activity of the uranium salts was definitely traced to the presence of a foreign body, which Sir W. Crookes has christened for the time UrX (i.e., the unknown quantity in uranium), following a fashion initiated by Röntgen, and which has previously led to the introduction into our vocabulary of such terms as "Xe air" (Italian "aria Xata" or *ixata*).

We would suggest the name "Crookesium" as a substitute. Whether uranium-X is, or is not, identical with radium seems not fully decided but it appears to be distinct from polonium. It is now proposed to try to separate the radio-active component of thorium.

THE DARK LIGHT.

Le Bon, who claims to have anticipated the Becquerel rays in his "lumière noire," has expressed the opinion that the properties attributed to radium and polonium do not prove the existence of new elements, and may be accounted for by supposing the radio-active substances to be mere allotropic modifications of bismuth and barium. On this view there is no more fundamental difference between the properties of radio-active and ordinary barium than between phosphorescent and ordinary sulphuret of lime. Giesel, of Brunswick, also has adopted the terms "radio-active barium" and "radio-active bismuth" in preference to "radium" and "polonium." In support of the opposite view, Demay has proved that radium possesses a characteristic spectrum, and M. and Mme. Curie find that the atomic weight of radio-active barium chloride is greater than that of ordinary chloride, amounting, in one specimen, to as much as 149 as against 137.

The pitchblende used in the preparation of these substances is obtained from Joachimsthal, in Bohemia. Under the direction of Giesel, working in co-operation with Professors Elster and Geitel, the firm of E. de Haen, of List, near Hanover, have undertaken the preparation, in small quantities, of radio-active barium emitting rays that are unequal in intensity, and have also placed on the market cheaper products which also emit rays of sufficient intensity to visibly excite a fluorescent screen. The solid radio-active compounds of barium increase in activity from the time of solidification, but do not reach their maximum for more than a month. The barium preparations are all luminescent, the chloride and bromide, especially so when dry. According to Giesel, the bismuth or polonium preparations lose their radio-activity in a few weeks, and this property is also cited by Elster.

BECQUEREL RAYS.

The radio-activity of barium bromide is found by Elster not to be destroyed by continuous heating for twenty-four hours *in vacuo*. After cooling, the strength is much reduced, but is restored after the lapse of a few days to nearly the original intensity.

Becquerel rays resemble Röntgen rays in their power of "ionizing" air, a property they possess to such a degree as to discharge all conductors within a considerable distance of the radio-active substance. Their action on electric sparks has been studied by Elster and Geitel. A spark gap one cm. wide, consisting of a positive knob and a negative disc, was exposed to the radiations from a barium preparation. The sparks or brushes were converted into a violet glow discharge, but the former discharge was re-established on interposing a plate of lead. With discs made of semi-conducting card the radium affected the discharge at a distance of over one metre. According to Elster, heating a small trace of a radio-active substance in air in a Bunsen flame increases the electric dispersion of the air of the room.

Becquerel finds many bodies acquire the temporary power of discharging conductors under the influence of the rays, thus affording proof that these rays involve a continuous emission of energy. The bodies do not, however, act on a photographic plate, and their activity is lost on heating. This property is not assumed by the double sulphate of uranium and potassium.

There appears at present no prospect of utilising Becquerel rays as a substitute for Röntgen rays in surgery. The difference of behaviour of the two kinds of rays is well shown by two radiographs of the human hand accompanying Dr. Walter's paper. In the one taken with Röntgen rays the outlines of the bones are remarkably clear and sharp: in the other, taken with the rays emitted by Giesel's most powerfully radioactive preparations, a dark, ill-defined shadow of the outline of the hand is seen, but not a trace of the bones is visible. This latter radiograph, which was taken with the relatively short exposure of an hour, shows clearly the shadows of a needle and of a coin that were placed under the middle of the hand, proving that a certain proportion of the rays had actually passed through the hand, but without differentiating the bones from the rest. Experiments undertaken by Walter to account for the hazy outline of the Becquerel radiographs point to the conclusion that the Becquerel rays, when passing through substances of small atomic weight, experience a far greater diffuse scattering than Röntgen rays. Further, the secondary radiations emitted by both light and heavy substances under the influence of the Becquerel rays differ far less from the incident rays in intensity and penetrability than in the case of the secondary rays investigated by Sagnac in connexion with Röntgen rays.

A further difference lies in the far greater absorption of Becquerel rays by specifically light substances, such as those forming the flesh of the human hand. With the use of a platino-cyanide of barium screen, Walter observed the same absence of all traces of bones as with photographic methods, although the shadow of the hand was clearly seen on the screen.

COMPOSITE NATURE OF BECQUEREL RAYS.

The composite nature of Becquerel rays is suggested by experiments on phosphorescence and selective absorption, as well as on magnetic deviation. Mme. Curie has found that Becquerel rays are more easily absorbed when they have already penetrated an absorbing layer than when they have not. One aluminium disc absorbed a certain proportion of the rays; a second aluminium disc absorbed an even greater proportion of the remainder. According to the note on Mme. Curie's paper in *Science Abstracts*, "this is due to the fact that the less penetrative rays are absorbed in the first absorptive layers," but such a view would more naturally lead one to expect that the proportion of absorbed rays would be less at the second screen than the first, instead of greater; the phenomena can, however, be accounted for by the hypothesis that the first screen transforms the rays into secondary rays of lower penetrating power. The existence of such secondary rays has been supported by Villard, Meyer, and Schweideler, Dorn, and others. Becquerel has, however, shown that, in the case of polonium rays from the Curies' preparations, no secondary rays are emitted by aluminium. The phenomenon of selective absorption has been studied by Becquerel, who exposed various substances to the action of radio-active barium chloride, including hexagonal blende, platino-cyanide of barium, diamond, and double sulphate of uranium and potassium. The phosphorescence varied in different cases. When different screens were interposed, namely, aluminium, mica, black paper, glass, ebonite, and copper, the absorptions of the radiations which excite phosphorescence in different substances by the same screen were found to be unequal. R. B. Owens has shown that thorium radiations resemble those associated with the derivatives of uranium ore, but possess greater variety. There are indications that they are not confined to so few distinct types, if, indeed, the number of types is limited. Becquerel shows that the absorption of radium rays by screens is variable according to the distance of the screens from the source, and that the intensity of the radiation decreases with the distance more rapidly than it would do according to the law of the inverse square; both of these are results of absorption by the air. The view advanced by Le Bon two years ago, that Becquerel rays could not be polarised, has been confirmed by Rutherford.

MAGNETIC DEVIATIONS OF BECQUEREL RAYS.

The magnetic deviation of Becquerel rays has absorbed a large amount of attention during the last few months, and conclusions from recent experiments have in several instances been in contradiction with the inferences from earlier investigations. Thus a survey of the literature of the subject shows that, amongst others, the following views have been advanced: (1) that Becquerel rays are not deviated; (2) that they are deviated in air, but not *in vacuo*; (3) that the deflection gives rise to phenomena which are more marked with polonium than with radium; (4) that both radium and polonium rays are deviated *in vacuo*; (5) that radium rays show marked deviation, but polonium rays show no deviation whatever. The first negative result was obtained by Elster and Geitel; Giesel proved the magnetic deflection of the rays in air, and attributed the previously observed absence of deflections to the experiments having been performed *in vacuo*. Elster, by repeating the experiments with a different arrangement of apparatus, using the same radio-active bismuth and barium as in Giesel's experiments, has discovered the cause of his previous failure, and has established the magnetic deflection of the rays *in vacuo*. Giesel used a strongly radioactive bismuth preparation, and got more marked effects than with his barium compound; Elster, using a similar bismuth preparation and a relatively feeble one of barium, was led to infer that the barium radiations were the most deflected. In these experiments the rays are received on a photographic plate or fluorescent screen. P. Curie, on the other hand, has described an apparatus for comparing the magnetic deviation by means of the electro-dispersion produced by the rays. When not deviated, the rays pass out normally between two lead blocks, and traverse the space between the plates of a condenser, causing a current to flow; when deflected, the rays are absorbed by the lead blocks, and the current ceases.

Both Curie and Becquerel find that the magnetic deflection varies with different substances. According to Becquerel's paper of December 26, polonium showed no deflection, while radium showed a strong deflection,

The absence of deflection in polonium rays has been observed by Mme. Curie, who states that they travel in a straight line. In comparing these results with the different conclusions obtained by Elster, reference must be made to Dorn's hypothesis, according to which it is suggested that the primary rays are not deflected, but are transformed into deviable secondary rays. But, in a recent paper, Becquerel finds that the Curies' polonium rays are neither deflected by a magnetic field of 10,000 C.G.S. units, nor are they transformed into deviable secondary rays. He has also made experiments to test whether the curvature of radium rays is affected by interposing a screen, as would occur if the transmitted rays were secondary rays moving with lower velocity. No such effect has been as yet observed. The most probable inference at present is that there are two kinds of rays, one deviable and the other not. The Curies find both forms coexist in radium rays; and, from Giesel's experiments, the deviable rays certainly exist in some preparations of polonium, but were, doubtless, not present to an appreciable extent in the samples experimented on by the Curies and Becquerel. According to Curie, the rays from radio-active barium carbonate are deflected to a very different extent. Those rays which have the greatest penetrative power are the most easily deflected, and those rays which are not deflected only penetrate air to a distance of 6 or 7 mm. Becquerel finds that magnetically deviable rays are absorbed by different screens up to a certain inferior limit of distance, while they penetrate a screen that is placed sufficiently near the source.

When the magnetic field is uniform, and the direction of the rays is perpendicular to the lines of force, they describe circles and return to the starting point; when the rays start in a direction oblique to the lines of force, the paths are helices. These results have been recently verified by Becquerel, and from them it is possible to form a general prediction of the corresponding effects produced in a non-uniform field, such as that produced by a horseshoe magnet, which effects we now proceed to describe.

In Giesel's experiments the sensitive plate was laid on the poles of the magnet, film downwards, the polonium being placed below and in contact with the film. Between the black patch produced above the substance and the dark zone produced by the deflected rays, a number of dark traces were observed, resembling wavy hair, or like the ramifications in Lichtenberg's figures. Becquerel has shown that, when the radio-active barium is placed on one pole of an electro-magnet and a fluorescent screen on the other, the effect of exciting the magnet is to concentrate and contract the luminous area, a result unaltered by reversing the poles. When the rays pass across the lines of force, they, after proceeding upwards, are bent round, and impinge on the plate along a curve, which extends from one pole to the other, bending out of the way of the radiant substance in the centre. When a piece of radium preparation is placed on a plate in a uniform field near a plane normal to the lines of force, the result is an intense impression limited by a spiral, whose sense is that of the current which produces the field. This spiral is the trace, deformed by the field, of the line of intersection of the vertical plate and the plate on which the radium rests.

DEVIATION.

In the *Journal de Physique* for April, Becquerel shows that different radio-active compounds of barium emit rays that are equally deviated, and he establishes the fact that the deviation conforms to laws similar to those which apply to cathodic rays. The phenomenon of dispersion is established, and, by interposing strips of paper, aluminium, and platinum against the gelatine plate, on which the deflected rays are received, a kind of absorption spectrum is obtained, showing that the most deviable rays are the most readily absorbed under the conditions of the experiment. By calculating an inferior limit to H_p (the product of the magnetic force and the radius of curvature of the path) for the rays transmitted by various screens, the absorption by different substances is compared, and the results are of the same order of magnitude as for the cathodic rays. These and other facts suggest that part of the radiation is of similar nature to the cathodic rays, where small, negatively charged masses are transported with great velocity, and the Curies' experiments prove the existence of such charges, which, however, are exceedingly feeble. According to this view, the magnetic deviation is given by the formula, $v/m = H_p$, and, in an electrostatic field of intensity, F, the rays ought to undergo a deviation, $\theta = Fl \div (v^2 m/e)$, l being the length of the path. It appeared, at first, that the electrostatic force required to make any such deviation visible would exceed the limit for which disruptive discharge would take place in air, and could only be obtained *in vacuo*. In a foot-note, however, Becquerel tells us that he has since observed the electric deviation in air with a field of about 10^{12} C.G.S. units, and has

found for certain rays which pass through black paper the values $m/e = 10^7$ and $v = 1.6 \times 10^{10}$.

CHEMICAL EFFECT OF BECQUEREL RAYS.

The chemical effects of Becquerel rays have been examined by M. and Mde. Curie and Becquerel. They may be briefly summarised here: The rays from active salts of barium transform oxygen into ozone, a process involving a continuous expenditure of energy. Potassium iodide is coloured blue. Glass in contact with the salts is coloured violet, ultimately becoming nearly black, and the colour penetrates the glass. This phenomenon is analogous to the colouration of fluor spar by cathodic rays. Platino-cyanide of barium screens gradually turn yellow, then brown, and finally lose their fluorescence, which, however, is restored by exposure to sunlight. Fluorine continues to phosphoresce for twenty-four hours after being excited, and calcined fluor spar which has lost its phosphorescence regains its luminosity in the presence of radium. Chemical activity is confined to those radio-active preparations which are luminous, but is not always proportional to the luminosity.

According to the Curies' experiments, powerfully radio-active compounds of radium and polonium, when they act on inactive substances, are able to communicate radio-activity to them. This induced radio-activity increases with the time of exposure up to a certain limit. If the inducing substance is 5000 to 50,000 times the activity of uranium, the induced activity may amount to fifty times that of uranium. It is reduced to one-tenth of its amount in an hour after removal, but it may persist for many days, finally disappearing. The emanation of radio-active particles from thorium compounds, investigated by Rutherford, is remarkable. This emanation ionises the gas in its neighbourhood, and it will pass through thin layers of metal, through thicknesses of paper, or through a plug of cotton-wool. It is also unaffected by bubbling through hot or cold water, weak or strong sulphuric acid. The emanation retains its radio-active power for some minutes, gradually losing it. The positive ion produced in the gas by the emanation was found to possess the power of inducing radio-activity in all substances on which it fell, this power of giving radiation lasting several days. Whether the emanation be a vapour of thorium is doubtful.

The question as to the amount of energy emitted by the Becquerel rays has already been referred to in *Nature*, and need not therefore occupy our space further now. The problem of discovering the seat of this energy would seem of late to have taken another form. At first it was supposed that a difficulty would exist in reconciling the continuous emission of these rays with the principle of conservation of energy; now, however, that the amount of the emitted energy has been estimated, the difficulty is seen to lie in the experimental observation of changes of such inappreciable magnitude as would suffice to generate this energy.

Before 1896 physicists were just beginning to grasp Maxwell's theories, and to realise more clearly the simplification introduced into notions electric and optical by the conception of the ether. The discovery of rays capable of discharging electrified bodies in air has not only shown the fallacy of our preconceived dogmatic notions as to the division of substances into conductors and dielectrics, but has taught us that the properties of the ether are not so simple as we had anticipated. We can only wonder whether Maxwell would have been able to develop his electro-magnetic and electro-optic theories had the complications arising from Becquerel and other rays been before him, and the want now makes itself felt of a second Maxwell, who shall co-ordinate the newly accumulated mass of experimental facts into the form of a connected mathematical theory.

G. H. BRYAN.

GAS CYLINDERS AND THEIR MANIPULATION.

STRANGE as it may appear to those who are regularly manipulating compressed gas in cylinders, and who never experience the slightest fear in handling them, there exists on the other hand a large number of nervous people who look upon cylinders as bomb shells, and never feel comfortable in close proximity to them, and this nervous feeling is not infrequently found among amateur lanternists to such an extent as to cause them to become more or less shaky when manipulating a lantern show, even although they have quite satisfied themselves that there is no actual ground for such nervousness.

When it is borne in mind that every cylinder has to pass through a series of the most exacting tests before it is permitted to be used by the public, or even charged to a limited extent with gas, it must be evident that there is no ground for anxiety when manipulating highly compressed gases.

All cylinders that are charged and employed at a pressure of 1800 lbs. are firstly tested to 4000 lbs. per square inch, and, to make certain that

this straining in testing in no way weakens the cylinder for future use, special apparatus has been devised, whereby the elasticity of the metal employed in the manufacture of the cylinder is ascertained. This apparatus was designed some ten years ago, and since then has never failed to indicate the correct expansion and contraction of the metal in a properly constructed cylinder.

In manipulating the gas from a fully charged cylinder, confidence in the actual safety of the operation is of the first importance, and, if any one cannot approach the work without a feeling of nervousness, he should refrain from having anything to do with limelight projection.

For many years there was a distinct prejudice against the use of compressed gas in lantern projection, a prejudice that was fostered not so much by dread of accidents as from the liability of the cylinders to leak, and also by reasons of faulty valve spindles in those of earlier construction. All this (with professional lanternists, at least) has passed away, and this method of utilising gas has become a necessity with modern projection apparatus, and although it would, perhaps, be going too far to say that leaky cylinders do not now exist, still it is really wonderful what little inconvenience the public now experience from this source, especially when it is borne in mind what a number of hands a cylinder has to go through even in the course of a year, many of whom have but little experience in the turning on and off of the valves. That the utmost care is bestowed by the different oxygen companies, when charging previously used cylinders, is from this fact alone apparent, for no employer in any company would ever dream of sending out a cylinder whose valve was faulty, there being a simple but extremely certain test applied to every fully charged cylinder, to see that all valves are absolutely tight before such leave the works. It may, no doubt, happen that a careless assistant in some optician's warehouse may, by over-tightening a valve spindle, injure the same in its sealing; but this is just where some experience is needed on the part of those permitted to manipulate a cylinder, and shows the necessity for the utmost vigilance and forethought on the part of those who are to operate with such cylinders, a golden rule being "never to depart without fully testing every part of a lantern outfit, and if any doubt take double cylinders."

It seems strange that what is really such a simple operation, as turning on the valve for the emission of gas from a cylinder, should puzzle so many people. Yet it is a striking fact, that many amateur lanternists, who would no doubt feel offended were any one to question them on this point, invariably do, in this simple operation, the very opposite of what they ought to do.

Some say they become nervous and lose their heads; at any rate, the experience of the oxygen companies goes far to show that the number of those who make mistakes in this direction are more numerous than many would suppose, and a few years ago this fact was apparent by the number of broken spindles that were produced by endeavouring to open a cylinder by turning the spindle in the wrong direction. This led to the various companies supplying a most ingenious key, with which it is practically impossible to turn a spindle in the wrong direction, or over-strain the same in shutting off the gas again; but, in the earlier make of cylinders, the spindles were made of softer metal than what is now employed, and this has to a certain extent improved matters in this direction.

Most people know, when using a screw-driver, that, when it is desired to send home a screw, the former must be turned to the right, and, when taking the same out again, the turning must be made to the left. Now, although the opening and closing of a spindle in a gas cylinder has to be done in exactly the same manner—that is, unscrew to the left when opening, and screw to the right when shutting off—somehow or other people will do the very reverse, and if the spindle is any way weak, or made of unduly soft metal, it is almost sure to result in the fracturing of the tool, and, unless an operator possessed of a large amount of experience be at hand with a suitable spanner, to unscrew the containing nut of the valve, there will be a poor chance of the intended show coming off with that cylinder, for a broken spindle is a very nasty thing to have staring one in the face, just on the eve of a lantern exhibition. If this awkward event should befall any one, the large spanner must be employed, with the utmost caution, and, if the gas does not come with a slight turning of the nut, it must not be proceeded with to any great extent, for fear of its being blown off, with disastrous results.

As a rule, however, the gas will respond to a slight turning with the large spanner; but this should only be attempted with caution and as a last resort.

In opening the valves of fully charged cylinders, only a slight turning of the valve spindle is necessary, or desirable, and, whenever a regulator

or fine-adjustment tap is being attached to a cylinder, the gas should always be turned on previously for half a second or so, so that a good rush of gas will effectually blow out any slight particles of grit or other matter which might otherwise interfere with the exact sealing of the regulator in the cylinder. It is surprising what a little matter in the wrong place will do when screwing up a regulator. To effect an absolutely tight union between the two nozzles, soft metal washers have been invented, but somehow or other these have never come into general use with professionals, at least so far as the West of Scotland is concerned. The idea, however, is a good one, and these soft lead washers are useful for preventing any leakage of gas between the cylinder and regulator.

The gauging of the contents of a cylinder is, of course, easily performed with a reliable gauge, and a little practice will soon teach any one to arrive at a correct estimation of the contents of a full, or partially full, cylinder. There is a very simple method—which is, perhaps, not so well known as it might be among lanternists—for at once reading the contents of a cylinder by means of a gauge.

In estimating the pressure as shown by the gauge, let the gas be very slowly and slightly turned on, and wait a little until the full back pressure of the cylinder has been admitted to it. On no account should the full pressure be at once screwed on. When the recording finger indicates the full pressure, note the number of atmospheres it indicates, and divide it by the constant factor of the cylinder. This factor, in the case of a forty-feet cylinder = 3; in the case of a twenty-feet cylinder = 6; in the case of a ten-feet cylinder = 12; and these factors are derived by dividing the capacity of cylinder with the number of atmospheres it will contain when full. All cylinders when fully charged contain 120 atmospheres, and therefore in the case of, say, a forty-feet cylinder, which indicates by pressure gauge, say, sixty atmospheres, when this is divided by three it shows it to contain just twenty feet, or, in other words, is half full; and the same with all other sizes of cylinders when divided by their own factors.

A reliable pressure gauge is a great convenience, and is absolutely necessary where much lantern work has to be undertaken. By, however, weighing the empty cylinder and noting carefully the tare of it, and again weighing the cylinder when fully or partially full, the contents of an oxygen cylinder can be estimated with a fair amount of certainty, because it is well known that one ounce of oxygen equals 0.7 of a cubic foot very nearly, and from this it is easy to calculate how much gas has been used from a full cylinder. In dealing with private cylinders this knowledge is useful, and I believe it was Mr. C. H. Cathcart who first drew attention to this method of ascertaining the contents of an oxygen cylinder. But for all practical work a gauge is necessary.

In turning off the gas at the close of an exhibition (or at any other time, for that matter), when a considerable amount of time is to elapse before the cylinder is likely to be used again, care must be exercised to see that the valves are quite tight; this is best done by placing a little water in the neck of the cylinder—if there is any escape of gas, it will be at once apparent. It should, however, be borne in mind that no undue pressure should be applied to valve spindles, and the large spanner should be used to tighten up the glands, if the same require it.

The question is often asked how much gas should have been used for some particular exhibition, and this is just one of those things that puzzle not a few. The chances of escape of gas by reason of faulty connexions and apparatus is so great that even experienced operators cannot, at times, account for the results they obtain, and sometimes the gases vary in quality to such an extent as to make the consumption difficult to understand. The question of economy in the using of compressed gas is one that has exercised a good many operators; a careless operator will run through a lot of gas without ever reaching a really good light on the screen; while, on the other hand, an experienced man will, by careful adjustment of apparatus and attention to fittings, get a better light with far less consumpt; and on the score of economy, where a cylinder has to do duty more than once, perhaps, a forty-feet cylinder will be found best, and there are those who maintain that a steadier pressure is got from a large cylinder than from those of smaller size.

It is, of course, well known that all hydrogen-regulator and fine-adjustment taps, so far as their union threads are concerned, are left-handed screws, but this does not mean that a hydrogen valve spindle has to be turned in the opposite direction to that of an oxygen cylinder when opening and shutting off the gas. The writer knows, however, that several instances are on record where the spindles on hydrogen cylinders have been fractured by operators turning them in the wrong direction, under the belief that the spindles were left-handed screws on hydrogen cylinders.

These mistakes, of course, only arise from ignorance.

T. N. ARMSTRONG.

IMPROVEMENTS IN OPTICAL PROJECTION APPARATUS.

[Szczepanik's Patent No. 17,514 of 1899.]

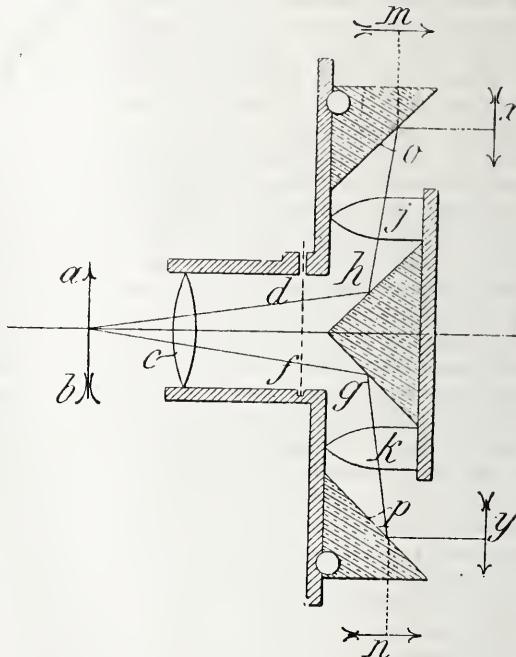
The patentee says that it is known that each portion of the opening in the diaphragm of an objective is sufficient to project an image. Hence, in order to project simultaneously two, three, or even more images, the pencil of rays passing through the diaphragm is divided into two, three, or more portions by means of mirrors. Consequently each portion forms an image which can be reflected by means of mirrors upon any desired surfaces.

a b is the object, which, in the case represented, is to be projected in duplicate. *c* is a lens or system of lenses. *d, f* is the diaphragm opening. *g, h* are two plane mirrors, the edges of which divide the pencil of rays passing through the diaphragm into two parts. *j, k* represent two lenses or systems of lenses.

It is obvious that the two lenses, *j* and *k*, yield exactly similar and sharp images, which appear on the surfaces, *m* and *n*. If, however, one wishes to direct the said images upon one and the same surface, two mirrors, *o* and *p*, must be used in addition, which are parallel to the mirrors, *g* and *h*. By this means two images, *x* and *y*, are reflected upon one surface.

For different sizes the lenses, *j* and *k*, must be moved away by equal amounts from the axis, which can be done in a known way by means of toothed wheels and racks, or of worms and worm wheels. If transparencies (*i.e.* translucent positives) are secured in the places of the images, *x* and *y*, and illuminated by means of condensers, one obtains from the two transparencies a common sharp image.

In a similar way, an apparatus for three images can be constructed. By means of such an instrument it is possible to produce naturally



coloured images. This is done in the following manner: Three colour filters, for blue, yellow, and red respectively, are inserted; one before each projected image, and either in front of the surface on which the images are projected, or just behind the diaphragm orifice, *d, f*. If, from the negatives obtained, one produces three transparencies, all the three images resulting from these three negatives, when placed in the position of the negatives from which they will have been produced, will, if three colour plates be used, be differently coloured, and will jointly yield, as is known, an image in natural colours. Since only a portion of the diaphragm is used, the luminous intensity of each individual image is small. In spite of this it is possible to project very luminous images by using a special source of light for each transparency. In this way one has at disposal three sources of light instead of one.

Since the exposures for different colours are different, the pencil of rays proceeding through the diaphragm opening must be divided by the mirrors in such a manner that the effects of the exposures for all the openings are equal in the same time for all three colours.

To take the photograph for each colour separately, the corresponding colour filter may be inserted in front of the objective, and the two other images that are not to be photographed be prevented from appearing by suitable diaphragms.

The apparatus hereinbefore described can also be used to produce two or more similar images simultaneously, also to produce simultaneously several images with different stoppings-off, and, further, for making use of one image for focussing on the focussing screen, and the other for photographing.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."

[August 3, 1900.]

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

THE first illumination of the Electric Palace and Fountain at Paris took place recently. An immense crowd had gathered to witness the sight, and at nine o'clock the circulation became difficult in this part of the Exposition. The public were not disappointed, for not only was the front of the Electrical Palace lighted up with a succession of colours, but also the fountain of the Château d'Eau was illuminated for the first time. The appearance of the fountains when viewed during the day is pleasing; the jets of water in the various basins are projected to a considerable height, and a number of sprays are sent into the basins from different sculptural groups around the border. At night, when the light is sent up from below into the jets, a strikingly brilliant effect is obtained, and the cascades appear blue, green, purple, or golden, as the different coloured lights are used in succession; the fountain is thus visible from all parts of the grounds. The rich carvings and reliefs of the great central arch reflect the light of different colours, and are thus seen under a new aspect.

* * * * *

THE London County Council's new by-laws issued a few months since deal with window-cleaning, painting, and flash or search lights. A fine not exceeding 5*l.* is imposed upon any person who, to the obstruction, annoyance, or danger of residents or passengers, orders or permits any one to stand on the sill of any window for the purpose of cleaning or painting, at a height of more than six feet from the level of the ground, without support sufficient to prevent the person from falling, and a fine not exceeding 20*s.* for the person who stands on the sill under the circumstances. The second part prohibits the exhibition of any flash light so as to be visible from any street and to cause danger to the traffic. The expression "flash light" means and includes any light used for the purpose of illuminating, &c., any word, letter, model, sign, device, or representation in the nature of an advertisement, &c., which alters suddenly either in intensity, colour, or direction. Search lights are prohibited under the same conditions as flash lights, the term "search light" meaning and including any light exceeding 100 candle power, whether in one lamp or lantern or in a series of lamps or lanterns used together and projected as one concentrated light, which alters either in intensity, colour, or direction.

* * * * *

A SOUTH AFRICAN correspondent writes: "We here have one great drawback, we are unable to get gas in bottles, so have to resort to the gas-bag and saturator. Now, as you are aware, the

pressure on a bag is limited (mine is an eight-feet bag), and frequently I have two hundredweight pressure on same; it is not safe to do more. The intensity of the light is limited by the pressure, and not so much by the quantity of gas consumed. What is wanted is some small handy machine which will enable a lanternist to pump the oxygen from a bag into a bottle; this, I fancy, is possible, but would take some time to accomplish. Otherwise, I do not see how we can get a brighter light than about 400 candle power out here. A Manchester injector jet has been sent to me from England with an outfit, and of course as such is perfectly useless. I have, however, altered it, and am able to use it, but the light is far from good."

* * * * *

A GLASGOW correspondent informs us that there are one or two new things coming out for next season's lantern production. One is a new regulator, and another a most ingenious lantern key, in fact quite a *multum in parvo*. There is a chance of a Compressing Company starting at Cape Town. At the present moment all compressed gas is sent from this country, and there ought to be a good field out there when things get settled down. Our correspondent adds: "I know one manager of an oxygen works who is seriously contemplating starting a company in South Africa. I have heard of a startling hitherto unsuspected source of danger in the use of saturators. They ought to be put down by Government."

LIMELIGHT MATTERS.

THE QUALITY AND CONSUMPTION OF GAS.

"SOMEHOW or other, I did not get the light to-night I should have had." How often is a remark of this description heard at the close of a limelight exhibition, even the best operators being frequently at a loss to account for the poor light they have obtained; and then, very probably, in their eagerness to bundle up the apparatus, in order to catch the last train, no more is thought about the matter for the time being, but the following morning, on proceeding to gauge their cylinders, they are surprised at the amount of gas they have run through on the previous night, and are more puzzled than ever to account for the poorness of the light and excessive consumption of gas. This is, doubtless, the experience of many operators in limelight work, and, when they endeavour to reason out in their minds the why and the wherefore for such a condition of things, it is just about ten to one they blame a leaky tube or badly fitting joint somewhere, or the regulators were faulty, or the cylinder valve was not tight, seldom placing the finger on the actual cause of the shortcoming.

Most limelight operators, after a little practical experience with their apparatus, and especially by reason of their studying the aperture of the jet they employ, will be able to form a fairly correct estimate of the amount of gas they are likely to require in fulfilling a particular engagement on hand, and then, by making a fair allowance of margin over and above the estimated consumption, they enter upon their engagement without any misgivings on the score of running short of gas. Yet, even with all their forethought, how often is an exhibition saved by the narrowest shave?—for here again the question of excessive consumption of one or other or both of the gases crops up, and they are quite at a loss to under-

stand how such a condition of things could have happened, when, with the same jets, regulators, &c., they have been able to yield a better light for a much longer period with far less gas.

In limelight working (especially since the introduction of compressed gas in cylinders) the "mixed gas jet" has become deservedly popular with professional and amateur lanternists alike, for any misgivings on the score of safety which may have been felt in the days of gas bags do not exist in working from cylinders; but were many of these lanternists, who invariably use the mixed jet in preference to the blow-through form, asked in what proportion the gases are burned in such jets, quite a variety of opinions would be expressed.

In the early days of the lime light it is well known that the gases were mixed and stored in their combining proportions in *one bag*, these proportions being two-thirds of *pure hydrogen* and one-third of pure oxygen; but, with the gases in this state of combination, only very small apertures in the jet could be employed.

The extremely dangerous nature of the gas in this condition soon led to the gases being stored in different receptacles, and no sooner was this done than a much greater degree of safety and comfort in working was assured, especially when both gas bags were placed under double-pressure boards, and acted upon by one and the same set of weights.

With the introduction, however, of the double gas-bag method of working, further important changes took place; not only was greater safety secured, but a very important alteration took place in the quality of the hydrogen gas employed, and it is to this alteration, no doubt, that much misconception exists in regard to the different proportions of hydrogen and oxygen gas consumed at the present time.

It has been said that originally the gases were combined and turned from the one bag in the proportions of two-thirds pure hydrogen to one-third pure oxygen; but, to utilise the gas in this extremely explosive condition, only very small apertures in the nipples of the jet could be employed with safety, and it may surprise many operators of the present day, and who have had even no experience of gas bags, to learn that bores larger than one-eighthieth of an inch could not be used to burn the gases when in their combining proportions in one bag.

Such extremely small apertures will appear strange to present-day operators, who now seldom use a jet with a bore smaller than the twentieth to the twenty-fifth of an inch, and frequently as large as the fifteenth of an inch; and, although it would be, perhaps, going too far to say that with such extremely small apertures a light was obtained equal to what an operator can produce with modern apparatus at the present time, still very fair results were yielded with *an extremely small consumption of gas*.

With the introduction of the double gas-bag method of working, "pure hydrogen" was seldom employed unless in out-of-the-way places and in laboratories, simply by reason of the much greater ease in filling a gas bag with carburetted hydrogen from the main supply pipe of any dwelling house. Pure hydrogen, therefore, was much more seldom in use, the carburetted form of this gas taking its place.

Lanternists, however, seem to have given but little consideration to the difference that exists between the combining proportions of carburetted hydrogen and oxygen as compared with that of pure hydrogen for limelight purposes, and we see this exemplified in a marked manner by several practical limelight operators actually writing articles and handbooks, in which the combining proportions of pure hydrogen and carburetted hydrogen with oxygen are given as the same with both forms of gases. This has, doubtless, led to much misconception on the part of those lanternists who have an idea that it does not matter whether house gas or pure hydrogen be used, the consumpt of gas will be nearly the same in both cases. To understand exactly the wide difference that exists between the combining proportions of the three gases, a student would do well to study a good treatise bearing on the subject of gases. It may, however, here be remarked that with pure hydrogen the combining proportions are two parts of hydrogen and one part of oxygen, whilst with the carburetted form of hydrogen the proportions are two parts of oxygen to one part of hydrogen, but with the carburetted form of hydrogen greater impurities are present.

To many these combining proportions do not appear to dovetail with their actual experience in the use of these gases by means of the mixed jet, and this brings up the question of purity or quality of the gases burned.

It has been said that originally the gases were burned in their combining proportions by means of extremely small orifices in the jets. With modern jets, however, it is actually impossible to burn either pure hydrogen or carburetted hydrogen in the proper combining proportions with oxygen without explosion, although, doubtless, were extremely

small orifices used, it could be done as well now as in former times. But with the introduction of the double gas-bag method came also wider bores in the jets, and it was soon seen that the gases, when adjusted for the best light, were not burned in their combining proportions at all, and hence the different opinions expressed by different writers, who are found stating sometimes that the gases are burned in equal volumes, whilst others assert that much will depend upon the bore of the jet, for, with large bores more hydrogen will be required than oxygen.

Practical lanternists generally consider that slightly more hydrogen than oxygen is consumed when working with fairly large or medium bores to their jets, and as a rule allow for such in estimating the quantity they will require, and in this they are quite correct, for with modern jets the gases are not burned in their combining proportions when properly regulated for the best light. The well-known "snap out" explosions may be cited as an object-lesson in this matter.

If a lanternist desires to satisfy himself on this point, he can easily do so by using any mixed jet, and when he turns on a supply of hydrogen and lights the same, the moment he admits the oxygen, so as both gases are in their combining proportions in the chamber of his jet, that moment the "snap out" explosion takes place. So long, however, as he so regulates both gases so that such a combination does not occur, so long will he keep a good and steady light.

With this knowledge, therefore, how does it happen that there is so much uncertainty in the quality of the light often procurable, as well as such a wide difference in the quantity of gas consumed? The answer undoubtedly lies in the word "Quality."

An operator may have carefully examined all his apparatus and quite satisfied himself that everything is as it should be, and still he will not be able to yield as good results as he would like, for the simple reason that he has no control over the quality of the gas he is burning. Take, for instance, the gases as supplied to the public at the present day by our large compressing companies! No one for a single minute would insinuate that any of these respectable firms would knowingly send out cylinders of gas of inferior quality, and yet the fact remains that poor gas does find its way into a lanternist's hand. How, then, can this state of matters be accounted for? Very simply indeed! Any of our gas-compressing companies are at times liable to have the valves of their pumps slightly wrong without their being aware of it, and the result of this is that atmospheric air is pumped into the cylinder along with the other gas that is being charged. It takes a little time for any of the men engaged in pumping to find out that their valves are not right, but before they are put right again the mischief is done and cylinders are charged, in the firm belief that pure gas only is contained in them, that may in reality have as much as twenty per cent. of atmospheric air.

It is when such faulty samples of gas reach the lanternist's hand that he is in a quandary with regard to his inability to get a satisfactory light, as well as to account for the unusual quantity of gas run through. No doubt our compressing companies do their best to prevent occurrences of this description, but machinery will give out by reason of wear and tear, and in the early days of the cylinder method of working, no doubt, this had much to do with old gas-bag workers asserting that the gas was better when made by themselves in a retort in the usual way.

It would therefore appear that lanternists are very much in the hands of the manufacturer in this matter, and that the only royal road is to take plenty of gas and trust to the quality being pure.

T. N. ARMSTRONG.

STEREOSCOPE ADJUSTMENTS.

[From the Photo-Review.]

THE total reflection stereoscope of M. Drouin is contructed with a double reflection prism by means of which the apparatus is confined to the smallest bulk possible, while at the same time it is universal in its movements. By its aid one can examine not only correctly mounted stereoscopic prints, but even reversed views, and this whatever the size of the picture.

Whilst with an ordinary telescope the observer has only to place his eyes before the apparatus to instantly see the view, the total-reflection instrument demands some little trouble in the way of a species of focusing before each picture is perfectly seen. As those who may have occasion to use the instrument may find its construction and adjustment the following notes and diagrams are given with the object of making this clear.

Fig. 1 shows the stereoscope placed normally before the eyes for the

examination of a print. The prism, P , deviates in the ray of light reaching the right eye, O , in such a way that the right-hand image is perceived as if it were superposed on the left-hand image, which is viewed directly by the left eye, O' . It will be at once understood that, unless the prism, P , is in exactly the right position, this coincidence will not result. It is necessary to adjust it with each view examined, an operation which is done instinctively and without effort after a little

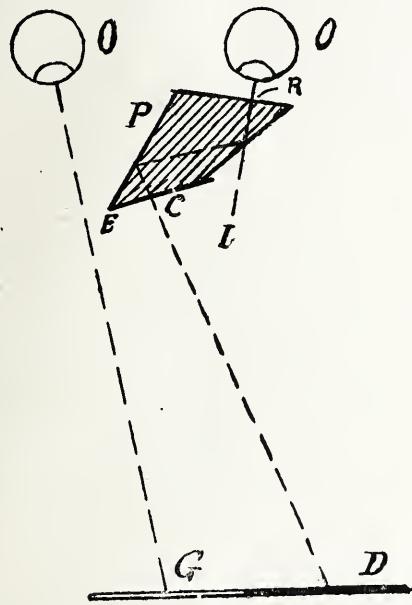


FIG. 1.

time. The quickest way to train the eye to thus instinctively make the necessary adjustment is to study the effect of each departure from the normal. This we do in the following diagrams.

Let us take the case of a properly mounted stereogram, indicated in the figure by two crosses, each in a square, one of X shape, and the other a St. Andrew's cross (fig. 2).

The first point to note is that the circular aperture, R , should be as close to the right eye as possible, and that the rectangular opening, C , should face the print, D . The angle, E , of the prism (fig. 1) should be

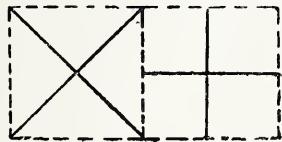


FIG. 2.

directed towards the left-hand image. When commencing to use the instrument, a simple subject is chosen, such as a portrait against a plain background. Most probably the two images will be rather smaller than usual, that is to say, there will be a small space between them. They should be mounted on a black card about sixteen inches long, considerably longer, in fact, than the two prints.

It will also greatly assist the manipulations which are described below if the prints are of different colours, one black and the other, say, blue.

The special stereogram having been thus made, it is held before the

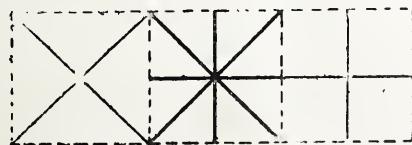


FIG. 3.

eyes at a distance of about fourteen inches, being supported in the left hand. The stereoscope is then taken in the right hand, placed in front of the right eye, and the left eye closed. We shall then see (with the right eye) the print through the stereoscope. We then place the latter so that the right image is in the middle of the field, and open the left eye.

What happens? Either in the two views, coinciding by chance, we perceive the effect of relief, or (most usually) we shall see two confused images impinging more or less on each other.

Let us here say, in parenthesis, that, when the right eye observes the right image in the stereoscope, it sees not this right image only, but part or all of the adjacent left image. Similarly, when viewing the left image directly, the observer sees also the right image. Hence, when by a con-

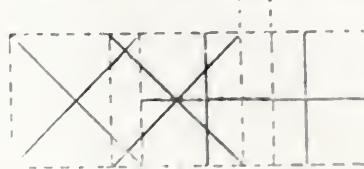


FIG. 4.

venient device these two images are superposed, the appearance of the conventional stereogram selected above is that shown in fig. 3.

Similarly, when the images are not exactly superposed, but are separated more or less from one another, we see four images, or parts of images, amongst which it is necessary to learn to distinguish the two useful images. These are shown in heavy lines in fig. 5.

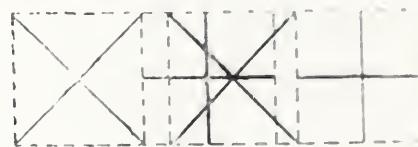


FIG. 5.

Going back now to the conditions referred to above, viz., to the moment when we had opened the left eye, we give the prism a slight rotatory movement on either side of its imaginary axis, $O L$ (fig. 1). When this is done, one of the prints (the one observed through the prism) will be displaced in the direction of its height. The right image of this stereogram

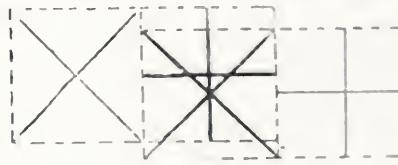


FIG. 6.

is one of the useful images; the left image is the other. In order to get these two images super-placed, it is necessary to remember only that—

(1). By removing the stereogram further from the eyes these images are separated from one another.

(2). By placing the stereogram nearer, this distance is diminished.



FIG. 7.

(3). By turning the stereoscope round $O L$ in a clockwise direction, the right image is raised.

By turning counter clockwise, the right image is lowered.

Thus, when the image appears as in fig. 4, the prints are too near the eyes, and must be removed till a coincides with b .

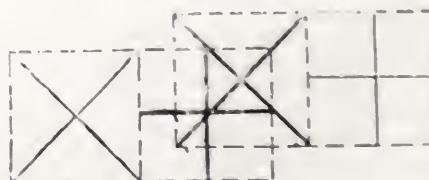


FIG. 8.

If, on the other hand, the effect observed is as in fig. 5, the prints must be brought closer.

The appearance shown in fig. 6 denotes that the prism should be turned in the direction of the hands of a watch.

On the contrary, fig. 8 is a diagram showing the state of things remedied by turning the prism in a counter clockwise direction.

These separated examples are sufficient to show what must be done in certain cases. Thus fig. 8 requires (1) that the prints be brought nearer, and (2) that a slight clockwise movement be given to the prism.

When the observer has grown used to this simple diagram, he will find no difficulty in making the necessary adjustments for any prints whatever. He may begin with, say, such a subject as a monument.

PANORAMIC PHOTOGRAPHS.

SOMEHOW or other during recent years, there would appear to be a distinct falling off in the production of sets of negatives specially taken for the purpose of yielding panoramic pictures, the reason for this very probably being found in the existing rage for snap-shot views taken by means of small cameras held in the hand; for there is little doubt that with the advent of hand-camera work there came a distinct falling off in the demand for cameras of larger size, which were so much in evidence during the early days of the bromide dry plate.

Ten years ago hand-camera work may be said to have commenced. At that time the dry plate had enlisted a very large numbers of workers, nearly all of whom were in possession of a whole or half-plate size of camera, and panoramic pictures were among the regular productions of workers at that time. At the present day, however, very few are found making this class of pictures, and it seems a pity that such should be the case, for in many ways panoramic views by means of photography are not only useful in recording scenes, such as public functions, but at the same time are highly interesting in landscape work, where some of our grandest views are incapable of being included on a plate even by the widest-angle lens we possess.

To the professional worker panoramic work (or what may be termed as such in a limited degree) is frequently of considerable value, especially in these days of half-tone process blocks, where so much has to be done in book illustrations and for advertising purposes.

The preparation of negatives specially intended for being printed in panoramic forms calls for no special apparatus in their production beyond a good size of camera and a really sensible rigid tripod. It would, perhaps, be going too far, when criticising tripods, to say that a really perfect tripod ought to have no joints in its construction, and that the head ought to be as large as the base of the camera it is so intended to sustain; but, on the other hand, there is no doubt nine-tenths of the flimsy, rickety things sold at the present day as the most recent advances in "portability" are quite unfit for serious photographic purposes, and dealers really ought to prevent them finding their way into the hands of beginners.

In landscape working especially how often do we hear such expressions as, "Oh, if I could only just take all that view in! wouldn't it be splendid?" and so, probably from ignorance of the fact that, with a good photographic outfit and the requisite knowledge of how to use it on such scenes, many delightful views are never photographed.

Take, for instance, the whole-plate size of camera with a fairly good narrow-angle lens, a very wide range of views may be dealt with by taking three negatives from the same standpoint. It is well known that the chief factor in panoramic photography is the exercise of care that the camera is held absolutely horizontal on the tripod head when being slung round for the purpose of taking the different views. The tripod must be very carefully set up, and adjusted by means of a circular spirit level, and, when so adjusted, the utmost care should be bestowed in seeing that it is not altered in any way when the camera is placed in position. The spirit level is then applied to the baseboard of the camera when extended, and the picture that is to form the first negative is focussed on the ground glass; the camera is then swung gently round on the tripod head so as to include the portion of view where it was cut off in the previous view; the spirit level is then applied again, and finally the camera is swung to the opposite side of the first view, and the same care bestowed in seeing that at each three points the tripod is causing the camera to stand absolutely level. This is the first action a novice should take when attempting this work. To enable a proper registration of the three pictures when the negatives are printed, it is a good practice to draw two upright lines on the ground glass of the camera about half an inch from each end on the focussing screen, and, when selecting the first view to be taken, some prominent object or distinguishing mark is brought so as to occupy a position on one of these lines; this will enable the worker to know how far to swing the camera round in each direction when taking the other views on left and right of

the one first selected, and also provide for a reasonable margin when the prints are trimmed, as well as permit of their being most accurately joined on the mounting board or cloth.

It need hardly be stated that, when so much depends on good definition in the pictures at their extreme ends, the services of a really good covering lens are required. In landscape work the objective can generally be well stopped down with advantage in this respect; there are, however, other subjects in panoramic work where there is a limit to the angular aperture that can be employed.

A suitable subject being selected, the camera is first arranged to take the centre view, and the plate exposed, the other views being treated to the same exposure, and the three negatives developed to as nearly as possible the same densities.

It will not be long before any one who undertakes this work will begin to recognise that the printing of negatives taken for panoramic views is not the least important part of the operation, for it stands to reason that much of the beauty of these pictures lies in their colour being uniform throughout, and it is just here where a beginner needs a little guidance from those who have a practical experience in printing these subjects, so as to yield the three or more prints all of the same depth in printing and colour in toning. This is, however, not really a difficult matter, and should not deter any one from attempting this class of work.

In the case of a beginner, say, possessed of a good half-plate outfit, and the negatives being taken after the manner described, the printing is performed with an ordinary half-plate printing frame as follows:—

A strip of sensitised paper is cut from a sheet, so as to be sufficient to cover the three negatives; this means providing a strip of sensitised paper cut from the longer portion of a large sheet 19½ inches (say 20 inches) long by 4½ inches broad.

This strip must be so folded (not cut into three pieces, as is generally done in ordinary printing) that each negative is printed in its proper position on the paper, *i.e.*, the centre negative being in the middle and the others to the left and right, as seen in the view. The paper, being so folded, will, if the printing is carefully done, suffer in no way, while each negative is being printed; but, if any anxiety does exist, a sheet of ordinary paper may be interposed between the folds, but in practice I never really resort to this expediency. After the first negative is printed to its proper depth, the print is removed and the next one placed in the frame, the proper unprinted portion of the sensitised paper is then placed in contact and the printing proceeded with. At this stage it may be well to describe, for the benefit of those who have never attempted equal printing in this manner, how the paper is folded at this stage. Say the first negative to be printed is the right-hand view, when the middle negative is next placed in the frame, the unprinted portion of the paper that is to receive left view is folded over and falls in between the already-printed portion. In this position, when the printing frame is opened for the inspection of the print, a printer can see in a moment not only the depth of the middle print, and how far it is printed, but can compare the same with the first portion, and detect in a moment when both negatives are printed to exactly the same depth. The left-hand negative is then treated in precisely the same manner, and, on removing the three prints from the printing frame, it will be found that each, so far as depth in printing is concerned, is identical with its neighbour.

In toning it is desirable to manipulate the three prints without severing them, but this is not always possible with amateur workers, who only possess small dishes and a limited supply of toning mixture. In any case the prints should be toned exactly alike, and, if due care has been bestowed in producing the negatives and the printing been carried to the same depth, there is no great difficulty in toning.

The trimming and mounting require to be carefully performed also. When the prints come to be trimmed, they will each be found to contain some portion of the same view at their extreme ends. Some particular object must be selected where the prints are to form a junction, and each print cut so that it will exactly correspond with the other at this particular part of the view. One or two trials will, however, enable any one to do this in a neat manner, and there will be no trouble from unequal shrinkage of the printing paper if the three prints are produced on the one strip in the same direction as instructed. When nicely trimmed, they are mounted in the usual manner on boards or cloth; if the latter, the same should be equally stretched on a deal plank or table by means of tacks, so that, when the photographs are dry, they lie nice and flat.

To the professional panoramic work is of much greater importance than many might imagine. It is not only in landscape work he has to operate, there are numerous other subjects, such as large works taken from a high elevation required for advertising purposes. Reviews and race meetings for book and newspaper illustrations, and many other

similar subjects, not the least of which being large excursion parties, children's treats, Sunday-school gatherings disporting themselves in a field, &c. It is wonderful what good results can be obtained by carefully electing a suitable standpoint from which the camera can sweep the entire view, results that cannot be approached by taking views here, there, and everywhere, at different standpoints.

Where shutter work has to be resorted to, the covering power of the lens must be carefully seen to, so that no falling off in the definition of the picture at the extreme ends of the plate is noticeable; this means using long-focus lenses on smaller-sized plates in many instances.

There is a wide range in which panoramic photographs may be made to do duty, and it is surprising we do not see professionals, as well as amateurs, practising such more largely than they do.

A. T. NEWTON.

ON RADIO-ACTIVE BARIUM.

[Reprinted from the *Chemical News*.]

FTER the uranium rays of Becquerel had been discovered, and G. C. Schmidt had shown that the thorium compounds emit similar rays, Curie found in uranium ore (pitchblende) a radio-active substance whose radiation was about 400 times that of uranium. They predicted in this substance a hitherto unknown element, coinciding in its chemical reactions with bismuth, and which they called "polonium." They did not succeed in separating polonium from bismuth.

These same experimentalists, in conjunction with M. G. Bémont, isolated in the same year a more highly active substance from the pitchblende, in which they likewise predicted a hitherto unknown element that they called "radium." Radium possesses the chemical properties of barium, and is as inseparable from the latter as is polonium from bismuth. Demarçay examined the spectrum of radio-active barium, and found next to the intense barium lines a new line, which apparently belongs to radium. Mme. Skłodowska Curie determined the atomic weight of active barium, and found it eight units higher than that of inactive barium.

The existence of radium in radio-active barium compounds is established through the radio-activity, the spectrum, and the higher atomic weight.

F. Giesel likewise produced radio-active barium from pitchblende. He proceeded by a method quite different from that of Curie. Out of 1000 kilogrammes of raw material he obtained 15 grammes of the preparation of radio-active barium. He also found some polonium combined with lead.

Finally, it may be remarked that Debierne had also isolated from pitchblende a very active substance, whose properties resemble those of titanium.

Many other experimentalists have worked at radio-active bodies; but their experiments were conducted almost exclusively with reference to the rays emitted by these bodies.

We thus know of radio-active bodies which have five different origins: the compounds of uranium, thorium, polonium, radium, and Debierne's substance resembling titanium. Uranium and thorium have been long known as chemically well-defined simple bodies; on the other hand, the three last-named are so far only hypothetical elements. Of these three hypothetical elements radium is the best known, as there are most accounts about it. The objective evidence of these accounts scarcely convinces one that radium is an existing element. For the existence of this element, two circumstances come principally into consideration from a chemical point of view, viz., the higher atomic weight of radio-active barium, and the spectrum of the same. Mme. Curie found the atomic weight of radio-active barium eight units higher than that of the inactive, from which she concluded that radium must exist. But when we consider that radium, which so entirely resembles barium, must be divalent, and as high an atomic weight as uranium, and, further, base our reckonings on the atomic weight of radio-active barium (145.8) found by Mme. Curie, it appears that the preparation from which the atomic weight was determined must have contained about 2 per cent. radium chloride: that is a considerable quantity, and it cannot be assumed that such a quantity of a foreign element would not betray itself during the various chemical transformations.

Also, if a close chemical similarity between radium and barium is assumed, in consequence of which the two elements could not be distinguished and separated from each other by means of the usual analytical methods, it is yet difficult to accept radium as an existing element. Demarçay has examined the spectrum of radio-active barium

and found in it only one line which was visible along with the intense barium lines, and which did not belong to barium. The spectra of calcium, strontium, and barium are of the same type; they consist of sharp lines and shaded bands; even the grouping of the lines and bands is alike. It was to be expected that radium, which is almost identically the same as barium, would show a similar spectrum.

Also, one must take into regard the fact that these new hypothetical elements are always found combined with other well-known chemical elements. M. and Mde. Curie found polonium combined with bismuth; Giesel with lead. Radium is combined with barium; Debierne's element with titanium. All these radio-active bodies have the same source, uranium pitchblende, from which they were separated by different analytical methods.

It can scarcely be maintained that chemical elements exist which are in no way distinguishable from other well-known ones, except in radio-activity; and it can scarcely be supposed that these elements, which can be transformed into various compounds, would in no single case give evidence of their presence in the chemical reactions but through their radio-activity.

Such considerations led me to examine experimentally the question as to whether the radio-active bodies contained new elements. After all the radio-active bodies known hitherto, which are said to contain a new element, were separated from the uranium pitchblende by analytical methods, I chose the synthetic method for the decision of the proposed question. For it is obviously clear that the question of radium being a chemical element must be answered in the negative as soon as it is found possible to transform ordinary inactive barium into the radio-active variety. At the same time this might be the synthetic production of radium.

My experiments carried out in this direction gave a positive result. It appeared that one can transform ordinary barium into a radio-active form which apparently possesses all the properties of radio-active barium observed by different experimentalists.

For the production of radio-active barium sulphate, the following should initially be noted:—Uranyl nitrate is melted together with 2 or 3 per cent. barium nitrate, the nitric acid driven off as far as possible by sustained heating, and the remaining oxides fused in the electric arc. The fused mass is dissolved in nitric acid, and the solution evaporated, by which means a large portion of the baryta separates as nitrate. The hot solution is decanted from the crystals, diluted with three or four times its volume of water, and the radio-active barium sulphate precipitated with sulphuric acid. Only a small amount of sulphate is obtained in comparison with the quantity of barium nitrate used. I obtained, from 20 grammes barium nitrate, only 3 to 5 grammes sulphate, which is undoubtedly still largely mixed with ordinary barium sulphate.

The most favourable conditions for the production of radio-active barium are not yet determined. But the fact that a radio-active barium sulphate can be obtained as above described, seemed to me to be sufficiently important to publish in a preliminary notice.

I have so far prepared three compounds—radio-active barium sulphate, and from this the chloride and carbonate.

Radio-active barium sulphate is precipitated as a fine white substance, adhering rather readily to glass when the acid solution is treated with sulphuric acid or a sulphate. The precipitate, when well washed with hot water, dried, and heated, is white with a tinge of yellow, perhaps due to a trace of uranium. The substance was put into a little glass vessel, the bottom of which showed a faint gleam of light, and the glass placed on a sensitive photographic plate, wrapped in black paper. After two hours the plate was developed, and a strong black mark appeared, corresponding to the transverse section of the glass. Hence the preparation was radioactive, and its activity increased after some days.

Radium rays are said to penetrate their metal sheets; my preparation of active barium sulphate emitted rays possessing the same property. One half of a copper coin was ground down to about one-third the thickness of the other half. The coin was laid between the vessel containing the barium sulphate and the sensitive plate, wrapped in black paper, and left there for three hours. After development, the plate was found to have remained white on the spot corresponding to the thicker copper layer, and had become grey beneath the thinner copper layer, of which there was an image surrounded with an intense black margin, indicating the action of the rays received direct on the plate beyond the copper coin.

Radium rays illuminate a barium platinocyanide screen; the rays of my substance exhibit the same property, though in less degree. The air becomes an electrical conductor by means of radium rays, and the same

is the case with my prepared active barium sulphate. The carbonate and chloride prepared from the active sulphate were also active.

This is, so far, the limit of my researches. They do not nearly suffice to decide the question as to whether radium is an existing chemical element, or not; but those facts render doubtful the existence of radium. The question can only be settled by a searching examination, and I have in hand the preparation of the necessary material in sufficient quantity to be able to undertake this examination.

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SIR WILLIAM ABNEY ON COLOUR PHOTOGRAPHY.

Nature, in a recent issue, summarises Sir William Abney's latest experiments in colour photography.

In his last communication to the Royal Society, he describes a method of estimating the luminosity of coloured surfaces that is especially applicable when the source of light is a large surface, such as the sky. In "Colour Photography," Part III., it was shown that only one ray of the spectrum, a greenish-yellow, progressed in luminosity at the same rate as white light. If, for example, red, greenish-yellow, blue and white lights are made of equal luminosity, and the illuminating beams are simultaneously and equally reduced in intensity, the luminosity of the red will diminish the most rapidly, that of the blue the least rapidly, the other two remaining equal. Moreover, the colour disappears more quickly than the luminosity (except in the case of pure red), tending towards greyness, so that colours of feeble luminosity are more easy to match than bright colours. The new method of colour photometry is based upon these facts. By means of concentric rotating discs, which are, when necessary, slit radially and interlaced, the proportion of black and white that matches first a green and then a yellow disc is determined. The comparisons are facilitated by observing the rotating discs through a "black transparent medium," such as an unstained developed photographic film, which may be so dense that the colour practically disappears, giving place to a dull grey. The value of a red disc is ascertained by interlacing it with the green and blue discs to produce a grey, which is then matched with the black and white. Thus, having three standard colours of known values, the luminosity of any other colour can be ascertained by substituting a disc of it for one of the standard colours to produce a grey, and matching the grey as before. The results given by this method agree closely with those obtained by the method previously described by the author. Sir William Abney has in this way determined the luminosities of various coloured surfaces, and calculated the amount of black necessary for each, so that they shall be reduced to equal luminosity. He has then prepared a disc divided into several annuluses, each partly coloured and partly black, so that when rotated the whole appears of equal luminosity when illuminated by the light for which it is calculated. By the selection of suitable colours, such a disc is a very convenient and effective test for any defect in either the colour sensitiveness of a photographic plate, or in the coloured screen used to compensate its inherent deficiencies in this matter; for the rotating disc, which is equally luminous throughout, will give, when the negative is developed, an image of equal density throughout, if the sensitive plate and colour screen are properly adjusted to each other.

ON THE MOUNTING OF LANTERN SLIDES.

[Paper read before the Photographic Society of Philadelphia.]

OUR English cousins, who generally do things the hardest possible way, and generally have a good reason for doing it, have adopted the square $3\frac{1}{2} \times 3\frac{1}{2}$ in. size for slides. The saving in weight of one hundred of these, as compared with one hundred American standard slides, is considerable, but after admitting this there is little to be said in their favour. As some of us have learned to our sorrow, there is but one right way to place a slide in the lantern so that the image may appear in its proper position on the screen. Now, with an English slide, which is square, it is possible to place it upside down, or on either of its sides, or right side up, and then turning it about, so that the left side of the picture appears on the right, to repeat the four operations again, making eight possible ways of inserting the slide in the carrier, and but one right way. With the $3\frac{1}{2} \times 4$ in., or American slide, there are but four possible ways of inserting

in the carrier, three of which are wrong and one right. There are thus seven possible wrong ways of placing an English slide in the carrier there are but three in the American slide. It will be seen from this example how easy it is to run American slides through the lantern with a fair probability of getting them right as compared with English slides but, in addition to this, the greater margin on the lantern slides, and more ample labels, makes it easier to make them in some certain way which may be easily distinguished by the operator in a dimly lighted room.

At first sight it would seem a very simple matter to label a slide for easy identification and insertion in the lantern; but, from the number of different schemes which make their appearance in going over a miscellaneous lot of pictures, one is almost led to believe it is a most difficult problem.

The American Lantern Slide Interchange, soon after its inauguration formulated a set of rules governing the mounting and labelling of slides submitted by its members, which I regret to say have been violated time and time again by some, while by others they have been observed principally by their non-observance.

Supposing that the slides for an exhibition have been arranged in order, about the only mishap which may occur is that the picture appear on the screen upside down. The little thumb label, which some considerate persons place on the lower left-hand corner of each slide when it is viewed in its proper position, is of great value, and no one who has not had experience with these little white circles has any idea of the comfort and relief they are when they are placed on the right—that is, the lower left-hand—corner of the slide. But, if blindly followed, the thumb label is pretty sure to lead into trouble, because there are several schemes of applying it to the slide. The English are the most fertile in these, and, not being satisfied with one label, often insist on placing two, three, or even four on the cover glass. These are worse than nothing at all, as they are most misleading.

One of the neatest methods of applying the thumb label is on the mat placed between the slide and cover glass. The side of the mat which comes next to the condenser is left white, and on it may be written the title of the slide, the author's name, or any other data, while a black dot on the paper cover shows very distinctly, even in a dark room, the proper position of the slide in the lantern. This method, if universally adopted, would furnish a satisfactory solution of the problem of slide marking.

Respecting the title label, which is usually pasted on one end, but little need be said; so long as it is firmly attached to the slide and legibly written upon, its duty is fulfilled. Some people paste this label on the front, when the slide is viewed in its proper position, and some on the back; doubtless many paste it on the first side they pick up. This label is mostly pasted on the left-hand end of the back, opposite where you would endorse your name if the slide were a cheque. The English slides, which usually are made on much thicker glass than common in this country, often have the names written in very small letters on the edge. The advantage of this is that the title may be read while the slide rests on end in the box, but the space is so small that best but a few words can be written. The title label on quite a number of slides is placed on the front, opposite the thumb label. This is rational, as the name can then be read without turning the slide over, and the position corresponds with the title when written on the white mat.

W. S. VAUX, JUNR.

ON CUTTING AND MOUNTING STEREOGRAPHS.

[Reprinted from the *Australian Photographic Journal*.]

THE proper principles as to cutting the stereo halves do not seem to be thoroughly understood by some workers. The object of the stereoscope is to imitate artificially the ordinary vision, but there are certain limitations in the artificial stereoscopic vision which do not exist in the natural.

The eye is a very wide-angled lens, and the image thrown on the retina is very small compared with that of the photographic lens, so we are not conscious of any limit or boundary to the picture we see when we look out upon a landscape. It is vignetted, as it were, into imperceptibility. We may, by the action of the brain, widen or diminish the angle of perceptible view, as we concentrate our attention upon different objects in the landscape, but in no case are we conscious of any boundary to the field of vision.

But it is very different with the photographic lens. The angle of perfect definition is very much less, and, for the stereoscopic view

nvey the same idea of scale and proportion as that seen by the eyes, the pictures must be very much larger than those thrown on the retina, and, as the two pictures have to be mounted side by side, with centres more than three inches apart, it follows that only a narrow angle of view can be obtained, and the boundary of the stereoscopic picture will be unpleasantly conspicuous to the consciousness.

Our object is to minimise the disagreeable effect caused by this limit of the stereoscopic view. Now, there is a case in which there is an artificial boundary to the view seen by the eyes, and, if we study the conditions existing in such case, and try to reproduce them as closely as possible in the stereograph, we shall find that we have solved the difficulty in the way the most satisfactory to the artistic sense.

If we seat ourselves in a room and look out of the window, we see, beyond, a landscape limited by the frame of the casement. We are unconscious of the limitation, but the window frame, with the adjacent walls probably in dark shadow, does not distract our attention from the landscape, and does not annoy us, unless, perhaps, some object is passing out of view; in which case we move nearer to the window, for it is obvious that the angle of view will vary with our distance from the window; and, if we want to see more to the right, we will move to the left.

Studying the details of what we see outside the window, we discover, by shutting each eye alternately, that the right eye sees more of the left side of the view than the left eye does, and *vice versa*.

The amount eclipsed by the window frame from the one eye of what the other eye sees varies, we find, according to our distance from the window. If we are close to the window, a wide strip is cut off; but, if we are at the opposite end of a long room, the pictures seen by the two eyes respectively are nearly co-extensive.

It follows from this that, to give our stereograph the effect of looking at a view through a window, we must so cut the two halves of the print that the right-hand half shall show a little more of the left side of the subject than the left-hand half does, and *vice versa*; but how much is an important question, to be decided only by the requirements of each individual subject.

As the stereoscopic effect is caused by the superposition or blending of two similar but not identical pictures, the portion of each half which is not contained in the other half will not appear stereoscopically, but will have a ghostlike effect. It is important, therefore, that this imperfect strip on each side of the true stereoscopic picture should be as narrow as the subject will permit. As I have already said, the further we are away from the window the narrower will be these strips; if, then, we cut our pictures so as to show the imaginary window against the distance of the landscape, there will be no perceptible overlapping; and this is done by cutting the sides of the two halves very nearly through the same point in each, that point being in the *distance* of the view.

But now another consideration comes in. If we are sitting at a distance from the window, we shall see intervening objects in the room; and in the case of our stereograph, if we place the window in the distance, we shall have the foreground and middle distance inside our imaginary room. This, of course, in most instances will be an improper effect; if we are looking at a view through a window, the whole of the view is outside the window, objects seen inside do not properly belong to the view; they generally obstruct or disfigure it, though in some instances they assist it by throwing back the distance.

Now let us return to our window and study the effect of objects situated within the room. Fixing the attention on the window, and observing an object between us and the aperture, we shall find that, looking with the right eye only, it shifts towards the left side of the window; looking with the left eye only, it shifts towards the right side of the window. If the object is near to the eyes, the shifting is very great, and, if it is nearer to one side of the aperture, it will perhaps shift entirely out of the view of one eye; and if, with the attention still fixed on the window or landscape beyond, we look with both eyes, we shall see, not one, but two ghostlike images of the interior object, semi-transparent against the distance.

From this study we shall find that the right eye sees more of the right side of an interior object against the aperture of the window than the left eye does—just the converse of the case of exterior objects.

It follows that, to make our stereoscopic view appear as being outside a window, instead of cutting the two halves with reference to the distance, we must cut them with reference to the nearest object that we wish to have outside the imaginary aperture.

But now come in the difficulties. If we bring the window very close to the eyes, the overlapping strip of the distance will be very wide, and, consequently, the true stereoscopic portion will be comparatively narrow. The halves themselves will also be narrow, because the shifting already

referred to makes the measurement between the two images of a near object much less than in the case of a distant object.

It is best therefore to compromise and to cut the print so as to show very near objects as being nearer than the window. If they come to one side of the picture, they will appear as overlapping the aperture, but this cannot be helped.

It is advisable, however, whenever it is possible, to avoid having any very near objects in the view at all, especially coming in on one side of it. When it is impracticable to keep such objects out, the evil can be minimised by bringing the lenses as close together as they will go, if you have an adjustable front, and also by cutting the one half narrower than the other; that is, if the near object comes into the view from the right-hand side, you take a little more off the outer edge of the right-hand half.

JUDGE DOCKER.

INCANDESCENT GAS LIGHT.

The Photographische Chronik warns its readers against tables of the comparative chemical action of various kinds of light, when an incandescent mantle is used for a standard light. "Lux," a Dutch contemporary, has given the following information concerning the solutions used for the preparation of gas mantles, and it will be seen that the light varies considerably according to the salts used.

FOR WHITE LIGHT.

Zirconium oxide	40 per cent.
Lanthanum oxide	40 ..
Thorium oxide	20 ..

FOR ORANGE LIGHT.

Lanthanum oxide	40 per cent.
Thorium oxide	30 ..
Zirconium oxide	27 ..
Didymium oxide	3 ..

FOR YELLOW LIGHT.

Lanthanum oxide	40 per cent.
Thorium oxide	28 ..
Zirconium oxide	30 ..
Cerium oxide	2 ..

FOR GREEN LIGHT.

Thorium oxide	50 per cent.
Lanthanum oxide	20 ..
Erbium oxide	30 ..

The mantles are afterwards stiffened with a solution of water glass. Concerning the intensity of the light which may be obtained with gas mantles, if we take 60 candles as the equivalent of a mantle, 1020 candle power may be had from 17 mantles, which, with suitable reflectors, may be increased tenfold, say 10,000 candles in round numbers. By diffusing the light with paraffin paper screens a loss of 20 per cent. results, but if we place two rows of 6 mantles each on one side of the sitter, and a row of 5 mantles on the shadow side, there still remains sufficient light to obtain full exposure in a few seconds.

AN IMPROVEMENT IN RADIOPHOTOGRAPHY.

[Reprinted from the *Scientific American*.]

In a paper lately presented to the Académie des Sciences, Dr. T. H. Guilloz describes a series of experiments which he has recently made which show the remarkable diffusion of the X rays by the surrounding objects, and the importance of this action in radiographic work. It is, in fact, difficult to obtain a good radiograph of the thicker portions of the body which will have a good contrast, and the plates thus obtained generally show more or less fog in the development. This cannot be explained by a pure and simple absorption of the rays; it has been supposed by some that the action was due to the diffusion of the rays by the air, but this is, in fact, so small as to be entirely negligible in practical work, and could not produce the effect observed. After a number of experiments Dr. Guilloz seems to have established the fact that this action is due to the diffusion of the rays by the surrounding objects, such as the supports, containing apparatus, walls of the room and tissues of the subject, and in some cases by the body of the operator.

The following experiment shows how strongly worked is this secondary action or diffusion of the rays. The vacuum tube emitting the rays is placed above a large plate of lead about 1 m. square and 2 mm. thick. The plate has a rectangular opening in the centre, 4 by 10 cm., which allows the rays to pass. In order to have a region which is entirely

shielded from the action of the rays passing through the opening, a steel plate, 15 mm. thick, is placed over the lead plate, having one side in line with the side of the opening. The region below the steel plate is thus entirely protected from the action of the rays which proceed directly from the source, this being verified by using a fluorescent screen of platino-cyanide of barium, and it was found that it was impossible to obtain a silhouette of the hand or other object when placed against it. If now an attendant covers with his hand the opening through which the rays pass, or if the hand is placed in the path of the rays near the opening, the silhouette of the hand appears on the fluorescent screen. In fact, it is only necessary to place an object in the path of the rays, at any point where it may be viewed from the screen, to cause an illumination of the latter. It seems, therefore, that in taking a radiograph of a thick part of the body secondary or reflected rays are produced, not only at the surface of the body, but throughout its whole thickness, and the experimenter shows several radiographic plates which he has obtained by an exposure of two minutes under the action of the rays diffused by the body.

The negatives were obtained by placing a photographic plate in the position previously occupied by the fluorescent screen; the plate was wrapped with black paper, and one-half of it covered with tinfoil. An exposure of two minutes was made, placing before the uncovered half of the plate a pocket-book, the fingers, &c., this being done after all objects were carefully removed from the path of the rays. The tinfoil was then transferred to the other half of the plate and a second exposure made, while an attendant covered the opening with his hand. Upon development, the plate showed on the first half a scarcely perceptible image, this being, no doubt, due to a slight diffusion from surrounding objects; the other half, on the contrary, showed a vigorous impression, caused by the rays diffused from the hand. The experimenter lays stress on the fact that in taking a radiograph the operator should consider all the surrounding objects as capable of diffusing the rays, which strike the plate and produce a fog, especially with long exposure. In the case of those parts of the body which have but little thickness, this action may not be very perceptible, but for the trunk of the body, for instance, where a long exposure is necessary, these secondary rays play an important part, and the surrounding objects may give off rays which have the same order of intensity as those which have passed through the body. The best method of avoiding this action is probably to surround the subject by a lead plate which follows the contours of the part in question. A metal diaphragm may be used to advantage in front of the tube.

TESTING COAL BY THE RÖNTGEN RAYS.

EXPERIMENTS already recorded (*says Kuhlow's Review*) having led to the conclusion that the permeability of coal towards the Röntgen rays affords no reliable indication of the ash content of the sample, in that the accompanying slate is relatively transparent under their influence, whereas the presence of a comparatively small quantity of oxides of the heavy metals is sufficient to offer considerable hindrance to the passage of the rays, the author subjected the matter to further investigation, with the following results:—

A selection of the purest of a number of lumps of coal having been made, by examination with the Röntgen apparatus, the samples were reduced to powder and passed through a fine sieve (22 by 22 meshes per square centimetre), the ash content being determined, by direct calcination, as 1·66 per cent.

Next, the following six kinds of pit stone were powdered and sifted in the same way, their percentage of residue and iron content being also determined:—

	Residue. Per cent.	Iron. Per cent.
(1) Grey slate	93·14	0·79
(2) Black band	43·26	25·25
(3) Black band	65·50	39·03
(4) Black band	56·36	35·38
(5) Ferruginous slate...	43·84	19·00
(6) Ferruginous slate...	44·29	18·45

Mixtures were then compounded of the coal and stone samples, so that the percentage of ash was in each case alike, viz., 10 per cent.; and these, being placed in small paper boxes 17 mm. deep, were laid on the photographic plate and exposed to the Röntgen rays for three minutes, the distance between the plate and the source of the light being 25 cm. Notwithstanding their uniformity of total ash content, the samples exhibited very pronounced differences in regard to their permeability, the hindrance to the passage of the rays being in direct proportion to the amount of iron present; the one sample containing the smallest

quantity (0·07 per cent.) of iron was almost perfectly transparent, whilst that at the other extreme of the series (5·4 per cent. of iron) gave a fairly dense black print, the others ranging *seriatim* between these limits.

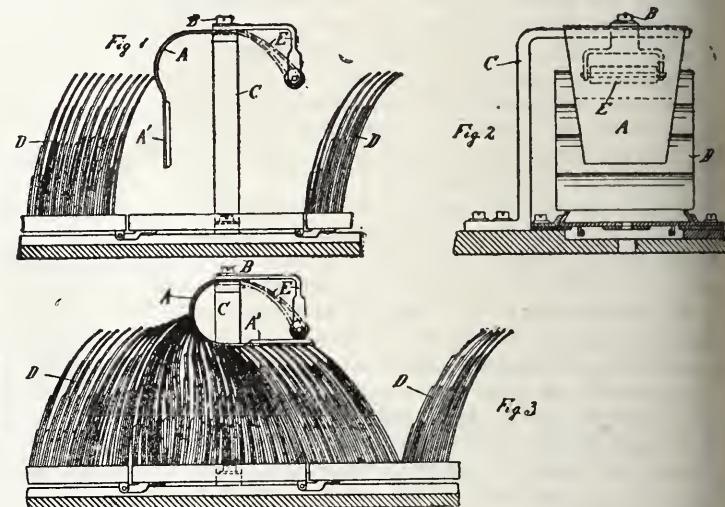
As for practical use the total percentage of ash is the sole point in question, the author therefore concludes that, however interesting it may be from a scientific standpoint, the Röntgen-ray test for ash determinations is quite valueless.

IMPROVEMENTS IN OR APPLICABLE TO APPARATUS FOR EXHIBITING "LIVING PICTURES."

[Malke's Patent No. 16,326 of 1899.]

THE patentee points out that in apparatus of the class in question it is usual to employ a block or bar to act as a brake upon the pictures passing under it for the purpose of holding back, or bending rearwardly, each picture until the proper moment for its release, but the brakes hitherto used act in a manner not making sufficient allowance for variations in the resiliency of the several pictures, or in their length; the brake hereinafter described, however, readily adapts itself to such variations, its construction is as follows:—

The brake consists of a flexible elastic strip A, which at A' is thickened



or strengthened so as to make it heavy and strong enough to flex the pictures passing under or by it. It is by a screw B, attached to a standard or upright c, placed in suitable position close to the path of the pictures. When the apparatus is in operation the pictures, D, successively pass the brake and are bent by it as will appear more particularly from fig. 2 of the drawings, the strip A also being bent. On the support c a stop is provided, this stop E limits the extent to which the brake can be bent. The end of the stop may conveniently be fitted with a roller as shown in the drawings, to diminish friction. Between the pictures D springs of parchment may be interposed to give more force to their movement at the moment when they escape from under the brake.

MENTAL PERSPECTIVE.

THE following extract from a contribution to *Knowledge* for August, by Mr. Parr, will afford food for reflection to those interested in the apparent variability in magnitude of celestial bodies. He says, "That this enlargement of the sun or moon when seen on the horizon is purely illusory is acknowledged by all, so that it is evident some kind of mental deception is here at work which tends to falsify our estimates of distance, and, consequently, of magnitude. It has been suggested, for instance, that, when looking at the moon near the horizon, we are unconsciously aided in our estimate of its distance by reference to intervening landmarks, such as trees, hills, or houses, the distance of which we already know, whereas, when looking upward at the moon in the zenith, there is nothing whatever to guide us. Now it has been observed that the distance of objects is almost invariably under-estimated when we are deprived of our usual landmarks, as, for instance, at sea, and it is suggested that by analogy the distance of objects in the zenith, or at high altitudes, is similarly under-estimated. Thus, the moon, subtending, as it does, the same angle to us, whether on the horizon or in the zenith, appears to us larger in the former and smaller in the latter position, for, as pointed out by Mr. John Turner, 'of two bodies of equal angular magnitude, that which appears to us to be nearer we think the smaller.'"

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THE LANTERN RECORD.

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LANTERN MEMS.

THE lantern season has come round again, or rather is within measurable distance, for the evenings are now drawing in, and the summer games will shortly be replaced by winter ones. In looking und to find what novelties, either in connexion with the optical or mechanical parts of the lantern there may be to make known, one has almost to sum them up in the one word *nil*, and I hardly remember, in all my experience, when there was so little to engage the attention of the lantern industry as there is at the present time. Many explanations have been offered for the "slump" in lantern matters, but my own idea is that, in the course of one of those cycles that so curiously occur in all matters of business and daily life, we have come to a part approaching "inertia," but presently the industry will move with its accustomed force.

* * * * *

WHAT is wanted is a "boom," something like the introduction of the triple lantern twenty-five or thirty years ago, an apparatus that required some technical skill and high-class workmanship to build up, sound common sense, patience, and practice to master details and operate properly, that cost sufficient money to prevent it being in the hand of every one, and so was valuable for exhibition purposes. Now it is only a matter of spending a small sum on a lantern, for very fair ones can be purchased at the present time from about 1*l.* upwards, and a child can work them. If a thing becomes too cheap, it is not then fashionable, and something else is taken up. It was the same with the table microscope. While it was considered *the* thing to have a fine binocular microscope, there was an immense scope for modification of designs, improvement in details, and the invention of apparatus; but, when the British professors followed the lead of the German biologists and introduced the German instruments of simple construction, and concentrated their efforts on bacteriology, then away went the microscope as a popular instrument. There are thousands of people at the present time that have no knowledge of how beautiful simple objects are under a properly constructed binocular microscope, and I should like to see the day return when popular *soirées* are given, and not merely a dozen microscopes on the table showing, except to the initiated, a most uninteresting series of rod-like and other forms of bacilli, but an array of microscopes numbering a hundred or more.

* * * * *

THOSE who see for the first time gold sand, the wing case of a diamond beetle, the brilliant eyes of the jumping spider, young

oysters, and other "show" objects of this class, are simply charmed, and it only wants the lead to be taken by an influential circle of ladies and gentlemen for the binocular microscope to again become *de rigueur*. I have somewhat enlarged on the subject of the microscope to emphasise my remarks on the popularity of the lantern, for if the owner cannot say to his friend, "I have such-and-such an improvement in my instrument," and "I had this apparatus for producing a dark ground (or other) illumination effect made to my own idea, and I have had this modification and that addition to this part fitted," he does not get the pleasure for his outlay or feel the necessary pride in his belongings.

* * * * *

THE day of simplicity is passing—at least, I hope so—in the interest of the lantern industry, and also for the popularity of the instrument as a scientific and entertaining adjunct. By this I do not mean that I should like in any way to curtail the use of simple lanterns for class purposes and showing photographs on club lantern nights, but what I should like to see is the introduction of something that will set the brains to work of the users as well as the makers of the apparatus, then friendly rivalry and some of the spare pocket money will do the rest. Are we to wait until colour photography is perfected for this day to come?

* * * * *

ELECTRIC light lanterns will be more and more inquired after as electrical power is more distributed, and, judging by the way the roads are up in the suburbs of London and other large cities, and the concessions to companies for producing and supplying the current, it should not be very long before electricity is available at most large houses and all halls and places of entertainment. One or two new pattern lanterns are announced for use with the electric arc light lamp. They do not vary much from the lantern as used for the lime light except that they are higher so as to allow for the carbons, and are more roomy so as to have more ventilation. They are either of Russian iron, or, for comfort in working, mahogany bodies, asbestos-lined, with a Russian iron inside lining, with plenty of ventilation. The great thing is to protect the woodwork in front, if any is there at all, so that the direct heat rays from the arc may not affect it. In the Society of Arts' new lantern the support for the condenser and front carrying objective is made of metal and quite independent of the body of the lantern, the woodwork of which simply serves the purpose of keeping the parts cool that are likely to be touched by the hands. A recent report of the working of Davenport's arc lamp at one of the provincial colleges, sent unsolicited after two seasons' use, is very flattering to the designer of the lamp and gratifying to the makers. No doubt there are other good lamps out, but, from what I have seen of the "Davenport" for lantern and general optical projection, it leaves little to be desired.

* * * * *

THOSE exhibitors who have returned from the Paris Exhibition are not very enthusiastic over its success, and one gentleman, well known in the scientific world and a popular lecturer with the

lantern, speaks very strongly of the way he was treated, the inconveniences he had to put up with, and the disregard shown for arrangements made, or the carrying out of a definite programme previously agreed to. One and all speak of the artistic beauty of the Exhibition, and the set of slides just published by Messrs. York & Son, which I have seen, shows this, also a view of the Seine frontage I saw recently taken by the Kodak Panoram, which gives a capital idea of the place, and illustrates the value of a panoramic camera for scenes with extended fronts. What an ingenious little camera the Panoram is! I was charmed with its simplicity and practical design. There is a big future for this. What a pity the Digue at Ostend faces north instead of south. It would be an ideal picture if it only had a midday light on it. However, Brighton, Eastbourne, Hastings, and Folkestone will not make bad pictures. I am just off to Holland. I do not know what success I shall have in snap-shutting, but am going to use the quarter-plate new folding Pocket Kodak, and hope to get something good. G. R. BAKER.

INVISIBLE RAYS.

THE last five years have, perhaps, elicited the greatest interest outside, if not also inside, scientific circles in the nature and action of invisible rays of one kind or another. They may be either of the nature of electrical or light rays, *e.g.*, waves in the ether, or composed of travelling material particles emitted from certain bodies. The phenomena exhibited by them, however, have been so unexpected and striking that, unlike the majority of scientific researches, they have aroused interest in the public mind and kept it glowing.

There is no doubt that this recognition is at least partly due to the great practical applications to which some of these discoveries have led.

The work begun by Crookes, Lenard, and others, and followed up by Röntgen, resulting in the "capture" of the rays bearing Röntgen's name, has been extended, and is now being applied so extensively throughout the world as to surpass the utmost expectations of those investigators. No hospital or medical man now considers a difficult diagnosis complete unless the patient has been subjected to a searching X-ray examination. Adequate X-ray equipments have been sent out to the front in recent campaigns, much to the comfort of both surgeon and patient. Many instances might also be cited of the rays being applied in commercial practice.

The brilliant work of Hertz upon ether vibrations of longer wavelengths, those giving rise to electrical radiation phenomena, has been the solid foundation upon which have been built systems of "wireless" telegraphy. These systems, in the practical hands of Marconi and others, are effecting a radical change in some of our present methods of transmitting messages and signals.

More recent work has brought to our knowledge the existence of other rays, some closely allied to the above, others of apparently a different order. As all these rays, at the dates of discovery, seemed to have distinctive properties, each was given a name; but it is very probable that further investigation will reduce the list, twins or triplets coalescing to form one definite kind of radiation. For instance, those known as Lenard, Röntgen, cathode, and canal rays have many points in common, and there is no doubt that both Lenard and cathode rays originate Röntgen rays, but upon the identity of the two latter present experiments are conflicting. Investigations tend to prove that cathode rays consist of electrified particles, which are much smaller than a molecule and which travel with a velocity little less than that of light. Röntgen rays, on the other hand, will not convey an electric charge, nor are they, like cathode rays, capable of being deflected by a magnet. If they are flights of material particles, they may be looked upon as discharged cathode rays, when the absence of magnetic deflection would be explained. Other experiments seem to show, however, that the observed absorption of Röntgen rays is not sufficient to be consistent with this material theory, but that the rays must be of the nature of irregular ether waves.

The second order of rays referred to is apparently of much less energy than those just considered, and the experimental phenomena observed with them are less striking. They are, nevertheless, of the utmost interest, for, although recent researches upon them are sometimes confusing and contradictory, the results obtained are vastly extending the knowledge of the physicist in the atomic world. Becquerel's discovery that uranium and its compounds emit radiations that are capable, among other things, of acting upon a photographic film, of discharging electrified bodies, and of being reflected and refracted, has been extended by

various workers to other bodies which possess similar properties in different degrees. Thorium emits rays similar to uranium rays, except that they are not polarised by a tourmaline plate. Pitchblende (oxide of uranium) was found to be more active than uranium itself, and this fact led M. Curie to the discovery of the new metal polonium, which is about 400 times as active as uranium. Pitchblende, indeed, seems to be a veritable mine for these radio-active bodies, for since the discovery of polonium two other active elements, termed radium and actinium, have been separated from it. The first of these, discovered by M. and Mme. Curie, proves to have 900 times the radiant activity of uranium and is self-luminous. The chloride of radium produces a photographic negative in half a minute where uranium or thorium would take hours. Through aluminium it can render a film of barium platino-cyanide (of which X-ray screens are made) permanently luminous, sufficiently to make it visible in the dark, and without any apparent supply of energy. Uranium and thorium do not produce this latter effect, probably because their action is too feeble. Actinium, the latest addition to the family, and bearing a close chemical analogy to titanium, has been found by M. Debierne in the residues of pitchblende. Its radio-activity is a hundred thousand times that of uranium, but, although its activity is so much more powerful, actinium is not, like radium, self-luminous.

In May last Sir William Crookes embodied, in a paper to the Royal Society, some very astonishing results upon the source of these rays. In fact, by a brilliant series of experiments, patiently made, he has shown that absolutely pure uranium and its compounds are entirely inactive, and that the so-called radio-activity of these is due not to an inherent property of uranium, but to the presence of a foreign body, which can exist apart from uranium. To this body he has given, provisionally, the name of UrX—the unknown substance in uranium. We are confronted therefore with another supposed new body with very great radio-activity. Whether UrX is also the substance giving rise to the activity of radium, polonium, &c., further experiments will, perhaps, show. It certainly seems possible.

As to the causes or nature of the radiation constantly emitted by these substances, it cannot be said that anything definite is yet known. The results hitherto obtained point to the conclusion that, as regards their effect on gases, the types of this radiation are similar to Röntgen rays and to the secondary rays, discovered by Sagnac and others, that are emitted by metals when Röntgen rays fall upon them. It is as if all space were constantly traversed by Röntgen rays of very high penetrative power, only revealed by their being transformed into secondary radiations upon impinging on elements of very high atomic weights, such as uranium, thorium, &c. Crookes calls in the aid of Maxwell's "sorting demon" in suggesting a cause for these effects. He furnishes these radio-active metals with the "demon's" power, so that they are able to separate the rapidly moving from the slow-moving molecules of air, appropriating some of the energy of the former. The energy thus gained would seem to be employed partly in dissociating some of the gaseous molecules and partly in maintaining a radiation across the ether. The necessary smallness and small amplitude of these waves would make them similar in many respects to Röntgen radiation. The air around the active substance would be cooled, but more air would constantly take its place. Under ordinary circumstances the cooling is not detected, and the energy of the radiation appears to be created out of nothing.

The most feasible explanation at present seems to be the one put forward by what is known as the ionisation theory, which supposes that the rays, in passing through any gas, produce positively and negatively charged particles in that gas, and that the number of these charged particles, or *ions*, produced per second depends upon the intensity of the radiation and the pressure. Argued in this way, the conclusion is supported that Röntgen rays and Becquerel rays are similar. Upon first consideration of this theory it would appear that the body emitting these rays would suffer a loss in weight, but M. Curie has shown that the charges carried off are so feeble, and the mass of matter so small, that probably some millions of years would be required to remove one milligramme in the case of the most intense radiation that has yet been discovered.

Whether these emission phenomena will be satisfactorily explained upon the ionisation theory or not, the physicist in so considering them is certainly deriving much help in the realm of atoms and sub-atoms. We are not now investigating the attributes of the molecule as chemistry considers it, but are breaking it up, separating it, and arriving more or less closely at what is known as the ultimate physical atom—in fact, the original "protyle"—about which so much has been said for many centuries, but so little known. Physicists, the last few years, have come to the aid of chemists, and, by very patient work, have endeavoured to break up the

combinations, to simplify the complexities into which it is believed the ultimate and universal atom enters to form what are generally known as elements and compounds. To grapple with the phenomena exhibited by the invisible rays we are now considering, the existence of such subatomic conditions is demanded. Will the "protyle"—let it be the hydrogen one or a still more fundamental one—be raised from its submerged position and fixed upon a true scientific pedestal?

We now come to consider another set of phenomena, also due to invisible rays, but rays of apparently a different nature to those above. These phenomena are, perhaps, all the more interesting to the general reader, as they can easily be shown by any one at any time. Several workers have noticed the effect upon a photographic plate of various substances when in contact with or when placed in close proximity to the film. These active substances are capable of producing a latent image upon the film, which can be developed up in the ordinary manner in the developing bath. There is not much doubt but that, prior to the researches of the two principal experimenters upon this subject, viz., M. Colson and Dr. W. J. Russell, thousands of photographers had at times unconsciously performed the same experiments. Frequently has a photographer been puzzled over inexplicable fogging and markings upon his film, although he has been certain no light has had access to it. Sharply defined scratches, lines of print, and other markings have at times been brought out by developers when an "unexposed" plate has been immersed in them, the cause of the mischief having been traced sometimes to pieces of newspaper, &c., in which the plate has been wrapped.

The most active substances in producing this effect are some of the metals, such as magnesium, cadmium, zinc, and aluminium, also copal varnish, printing ink, and the essential oils. It was at first thought that the action was due to phosphorescence, or that these metals were to be considered as active bodies, emitting rays with similar properties to those from uranium, &c., for it was remarkable that such slightly volatile bodies should give off sufficient vapour to act thus upon a photographic plate. Later experiments show, however, that a vapour is given off from them, and that this vapour is the cause of the action. The rays are, therefore, of a different nature to those from the radio-active bodies described above. Since printing inks are so active, it was easy to show that boiled oil and turpentine are the active constituents, these bodies exhibiting separately the same activity as the inks and varnishes. These bodies belong to what are known as the terpenes, and it is an experimental fact that all the terpenes are active.

For experimental purposes, these bodies can be used either as liquids in small dishes or by saturating Bristol board or other neutral and porous bodies. Not all volatile organic bodies are active; vegetable oils are, but mineral oils, as far as they have been tried, are not. A striking fact with regard to the emission from these active bodies is that it gives an accurate picture of the surface from which it has come. A hard copal surface on glass will give a picture showing every brush mark, unevenness, and scratch on the surface, and if the action takes place through a thin sheet of gelatine, or even as many as six sheets, still the picture of the scratches is distinct. That the action is due to some kind of vapour given off from these organic bodies many experiments will show. Saturate a circular piece of Bristol board with drying oil, and at a little distance above it place a smaller circle of mica, which is perfectly opaque to the action, and again above this another piece of mica with a circular hole smaller than the circular mica plate, finally a photographic plate over all. By this arrangement no direct action can take place between the drying oil and the sensitive plate, but a vapour could work its way between the mica plates, and thus reach the photographic plate. This it will do, for, after an exposure of about three days, upon developing the plate a dark ring will be formed, shading off toward the centre. Again, the active power of these bodies can be transferred to a neutral substance. If vapour be the immediate cause of the darkening of the film, then it would be possible, if a piece of Bristol board were suspended above the drying oil, for instance, for the inactive board to take up that vapour, and to become photographically active. This has been found to take place. If the temperature in these experiments is raised, the activity is increased, and the times of exposure may be considerably diminished.

The emanations possess a selective action, for whereas gelatine, celluloid, collodion, &c., are transparent, glass, selenite, and mica, even in very thin layers, are quite opaque to the action. It is certainly remarkable that a vapour should readily pass through these transparent media, and not by mere absorption, but in such a way as to produce a picture of the surface from which it came.

Experimenting in a manner similar to the above, but substituting a piece of polished zinc, or of any of the metals enumerated above, for the

saturated Bristol board, the same effects are produced on a sensitive film; the time of exposure is, however, longer. Since the effects observed with the organic bodies and with these metals are so very similar, we are forced to conclude that the latter also give off a vapour which acts upon the plate. Zinc which has long been exposed to the air is inactive. An exposure out of doors for only three or four days diminishes very considerably its activity, but covered up indoors after three weeks it will still give a tolerably dark picture. If it has a bright but perfectly smooth surface, it is active, but not strongly so; rub the zinc with coarse sand or emery paper, and it is then obtained in its state of greatest activity. The same applies to all the active metals. If, when in this condition, any of them be placed in contact with a sensitive film, a beautifully sharp picture of the scratched surface is obtained. The great increase of the fresh metallic surface produced by the rubbing may account for the increase of activity which the scratching produces. If the zinc plate be raised only slightly above the photographic plate, a sharp picture of the scratches is still obtained, and of course, as the distance is increased, so is the indistinctness of the picture, until at last it fades into a general cloudiness. In this form the zinc plate can easily be made to act through a distance of an inch or more. The vapour from it can permeate the same media as the organic vapour, and the remarkably clear pictures which can be produced through several sheets of thin gelatine prove that the action is not one of mere absorption.

Another experiment, illustrating the way in which these metals can act, is to take a piece of ordinary perforated zinc, polish one side and lay this polished side against a plate of plain glass in a printing frame, then place the photographic plate against the dull side of the zinc and leave it in the dark for three or four days. Upon developing the plate, a reversed picture is obtained; the holes in the zinc will be represented by dark spaces, and the zinc itself by light ones. If the holes in the zinc are large, they are represented by shaded circles, so that these pictures are produced by the vapour emitted by the polished zinc, and which has crept into the open spaces, thus gaining access to the film.

Pure mercury is an inactive element, but it is made excessively active by even the faintest trace of zinc in it. Not more than $\frac{1}{10}$ per cent. of zinc is required to effect the change. Magnesium and lead give the same result. This action has indeed been suggested as a readily recognised test for the purity of mercury in connexion with any purifying process.

The question now arises, What is the source of this action and how are the effects produced? Experimental evidence points very strongly to hydrogen peroxide being the active agent, although it can only be proved indirectly. Dr. Russell has shown that all the results produced upon the photographic plate, both by metals and organic bodies, can be produced by hydrogen peroxide. If some pure water is poured into a small circular dish and a photographic plate placed on top, nothing can be developed up even after a lengthy exposure of eighteen to twenty hours. If a trace of hydrogen peroxide is added to the water, a dark patch can be developed up after a short exposure. If the liquid contains only one part of the peroxide to a million of water, and the plate exposed to it for eighteen hours, a faint picture is produced. Plaster of Paris, wetted with a peroxide solution and allowed to set, continues active for a long time. If a large amount of the peroxide is allowed to act upon the plate, a reversed negative is obtained, the dark patch giving place to a light one. This result is similar to that obtained with dipentine—one of the most active of the terpenes—a dark picture being developed up after a short exposure, but, if the exposure is increased, the reversal takes place.

Just the same substances are opaque or transparent to the action of the hydrogen peroxide as are to the action exerted by the metals and the organic substances. Moreover, the metals arranged in their order of activity, magnesium, cadmium, zinc, nickel, aluminium, lead, cobalt, bismuth, tin, are just those that might be expected to decompose water, and, in the presence of oxygen, cause the formation of hydrogen peroxide and to induce it in this order of intensity. It may be mentioned here that the above list was arranged in this order from experiment, and at a time when there was no idea that hydrogen peroxide had anything to do with the reaction. Furthermore, in the case of the active organic bodies, it is a property of all the terpenes to give rise to hydrogen peroxide when oxidising. The mineral oils, on the contrary, are quite inactive, and it would seem therefore that all the organic bodies capable of acting upon a photographic plate in the way described are capable of giving rise to the formation of hydrogen peroxide when they oxidise in moist air. Recently, Mr. J. H. Vincent has brought forward further indirect evidence upon this point. He has shown that some of these bodies become active when treated with small quantities of ozone.

If the hydrogen peroxide is the active source for these phenomena,

how does it pass through the various "transparent" bodies? It cannot be said that a satisfactory explanation is yet forthcoming. The peroxide cannot pass through say—gelatine—by the ordinary methods of diffusion, and it would seem that the sharp picture of a scraped zinc surface that is obtained, upon development, after placing the zinc in direct contact with a film, should either be no longer visible, or become only a blurred result if such a sheet of gelatine is placed between them. This is, however, not the case, the scratches are still sharp. Dr. Russell suggests the action must take place by a process of dissolving, or by a feeble combination with the constituents of the gelatine, and thus reappearing on the other side. It cannot be assumed, however, that, in so travelling through, the molecule of the peroxide would preserve a straight course. If such a transmission does take place, the water which the gelatine contains is probably the body which enables the peroxide to pass through; for it can be shown that water aids the transmission of the action through other inactive bodies. For instance, if Bristol board in its ordinary condition is placed on a polished piece of zinc, the action from the latter passes through it slowly; but, if the board is damp, the transmission is much more rapid.

From what has now been said regarding this action, a photographer will very probably be able to trace to their source many irritating and hitherto unexplained developments. He will also be more alert as to what he uses as a covering for his plates. For instance, brass is an active body, a brass consisting of fifty per cent. zinc producing a fairly dark picture. Aluminium being also active, plates contained in aluminium backs are liable to become spoilt if allowed to remain there long. Wood also gives its own picture. The results observed, therefore, although simple in themselves, are of interest and importance, especially to photographers. It may be argued that the length of exposure required to obtain these impressions is so long, comparatively, that the effects will be quite negligible in ordinary work; but it must be remembered that plates and films are stored sometimes for weeks or months under coverings of various substances, and that brass and aluminium play an important part in cameras and slide backs.

In conclusion, it may be pointed out that glow-worms and ordinary bacterial cultures are capable of affecting a photographic plate, the action, in all probability, being also due to some kind of vapour emitted from them. Results are obtained even at a distance of an inch, whereas, if the bacteria are in contact with the film, definite pictures of the bacterial growths are produced. Self-luminous bacteria exert a much more powerful action than non-luminous ones.

JAMES QUICK.

PLEASING EFFECTS IN SINGLE-LANTERN PROJECTION.

THERE is no question about the fact that single-lantern projection has become deservedly popular since the production of lantern slides is a matter of such easy accomplishment by means of photography.

In previous years hand-painted slides were made to do duty in even what at that early period were deemed high-class entertainments, but, with the application of photography to this industry, a new era was introduced, and lantern projection jumped at once into prominence in many respects by reason of the truthfulness of the views displayed and the ease with which such were produced.

The optical lantern thus became closely associated with photography—an intimacy that has, and always will be, maintained, so long as lantern slides are produced by its aid.

The moment lantern slides were so effectively produced by means of photography saw a distinct change intervene on the part of photographers generally, in regard to the introduction of colour in the views specially prepared for the lantern; and this change was certainly fostered by the great majority of amateur photographers throughout the length and breadth of the land, who, very probably by reason of their inability to colour the slides they so easily produced by means of the now universal gelatine plate, were naturally seen bestowing more appreciation of black-and-white productions, to the utter neglect of really high-class coloured photographs, so seldom seen exhibited nowadays among our photographic associations.

On the other hand, there are, no doubt, many experienced lanternists and lecturers who have come to learn that, from among the public generally, there are a great number who have a strong appreciation for a little colour on the screen. Audiences are not always composed of high-art devotees, but are more frequently found showing their marked appreciation when a good coloured view is introduced among a series of plain photographic slides.

Apart from this desire for a few coloured pictures in a lecture set or entertainment, there is another matter bearing strongly on this question, which in these days of black-and-white projection is too liable to be overlooked, and that is the discomfort experienced by many in sitting out during the projection of a large number of black-and-white pictures, extending, it may be, over a period of one and a half hours.

With some people this discomfort takes the shape of a painful headache, with a nasty tightness across the forehead and pain in the eyeballs, and becomes more intensified the nearer a sitter approaches the screen. Hence how often do we hear expressions at the close of an entertainment such as the following: "I would have enjoyed it better if I had not got such a beastly headache."

Fortunately, the public seldom know the true cause of this discomfort, but a wise lecturer, or one who knows his business well, takes care to provide against such discomforts by introducing here and there, throughout his lecture, a few coloured pictures or otherwise tinted effects, for well he knows how beneficial they are with the public generally, notwithstanding that, now and again, a few individuals of the so-called "artistic set" never can see any beauty or utility in the introduction of such colour on the screen.

The writer can well remember discussing this matter with a prominent amateur photographer in the west of Scotland, who maintained that this feeling of discomfort was all bunkum, and did not, in point of fact, exist at all, where the ventilation of a hall or lecture-room was what it should be; and that, so far as his knowledge went, there never was a set of commercial lantern slides produced by a really first-class maker that could be said to be so black-and-white as to cause discomfort to any one in an audience.

This was throwing down the gauntlet with a vengeance! And so the writer took the earliest opportunity of showing him by ocular demonstration that others knew their business better than he could teach them. So, mentioning the names of three first-class makers of lantern slides, he selected the name of one who stands in the very front rank as a slide-maker, and I had not long to wait for my innings.

The lecture I requested him to attend was one on "The Holy Land," the lecturer being a gentleman who had travelled over Palestine and was intimately acquainted with the country, so that, on the score of the lecture being made interesting, nothing better could be desired. And so the evening came round, when we attended together. All went well, just as I expected, until the lecture was about three parts through. I then whispered, "Any headache, old man?" "Yes! I'm blowed, but I have a beastly pain across my forehead," he replied. "And I should never have believed it," he added.

No doubt some sets of slides are more liable to yield discomfort than others, but the remedy for this state of matters is well known, and consists in introducing at short intervals well-selected colour slides, or otherwise where commercial sets of slides have to be made use of, by resorting to the equally simple but effective alternative of using tinting glasses or screens. It does not follow that these tinting glasses should be employed with every slide. Such a procedure would yield a monotonous effect; but, on the other hand, a judicious use of a few carefully selected screens on slides that are specially noticeable for their strong contrasts never fails to impart a highly pleasing effect as well as to yield a fair amount of rest to the eyes of the spectators.

In providing for these adjuncts to a single-lantern outfit, little or no alteration is usually required in its structural parts, and, although provision is sometimes made for what is termed tinting effects in the best class of lanterns, strange to say, such provision is made in the worst possible manner, viz., by introducing tinting glasses between the objective and the screen. As to what is the proper place to interpose these tinters there is, fortunately, no doubt, for any one can easily understand that the only really sensible part to introduce them in is somewhere between the light and the slide. The reason for this is obvious, viz., such a position in no way interferes with the definition on the screen, which must be maintained at all other sacrifices. In the early form of high-class lanterns doors were provided behind the condensers in the body of the lamp. By this means tinting glasses were run through the aperture so as to intercept the light at a point between the lime and the back lens of the condenser, and this was a very suitable arrangement indeed. With many lamps such facilities, however, do not exist; but even with such lantern bodies the lantern front can generally be made to yield a passage between the condensers and the carrier sufficient to permit of a sheet of glass being introduced between the light and the slide. In private sets of lantern slides another expedient can be resorted to, viz., employing suitably tinted cover glasses according to the nature of the picture; but, of course, where a lanternist has to manipu-

late all sorts of slides at a moment's notice, he has no alternative but to use a lantern in which provision is made for such tinting glasses.

In nearly all lantern fronts it will be found that a fair margin of space is allowed for varying thicknesses of carriers, and, by blocking the collars forward by means of little wooden wedges, a space of a quarter of an inch or so is easily provided behind the carrier and the plate carrying the front of the condenser. This space is quite sufficient for the purpose, and is the ideally perfect position in which to employ tinting glasses.

It stands to reason that, if really good effects are aimed at, there must be provided a variety of tinters. This does not necessarily mean a large number, for, in reality, there is a limit to the number that can be utilised in a lantern. Three, or at most four, will be found ample for any series of lecture sets, and the tints or colours of these glasses are not difficult to obtain.

Having given some thought as to what are the best colours to provide, very likely an operator will find that for architectural subjects he will get the most pleasing effects with a pale French grey tint, and, in cases where portraits are shown, a nice light pink will be very suitable, whilst in well-defined landscapes and heavy outside subjects a greenish-yellow will prove excellent for the purpose.

These tinting glasses must be absolutely free from flaws, otherwise such defects will be painfully evident on the screen, and the colour of the glass must not be too decided. A very useful size (and it is one I employ regularly in single-lantern work in conjunction with a Beard's carrier, which gives an almost dissolving effect) is $9 \times 3\frac{1}{2}$ inches. The carrier is blocked forward by means of a strip of wood that runs the whole way across the front of the lamp. This strip of wood serves a double purpose, not only does it provide a space of about a quarter of an inch for the glasses to run through, but it provides a platform for the tinters to run and rest on behind the slides. Any one who grasps the idea of introducing tinting glasses to his lantern will, with a little thought, soon find out the best means of doing so, according to the form of the particular lamp he employs. Front tinted attachments, *i.e.*, flaps, working on the front of an objective, are certainly useful where sky and foreground effects only are desired, but the same results can be achieved quite as well by means of the hand and suitably coloured glasses held to the top and bottom of the lens just where the rays are emitted; but to introduce such glasses in front of the objective only tends to spoil definition.

In rendering pleasing effects with a single lantern, it is surprising how much may be done with a really good carrier. This is not the place to suggest the employment of any one carrier in preference to another, but I am often asked how such-and-such an effect can be obtained, and my answer is generally, By means of the carrier. The old-fashioned backwards and forwards movement of carriers for single lanterns did good service in its day, but it is now quite out of date in high-class lantern projection, and it looks also as if the lantern fronts of early days are to be entirely swept away and open stages take their place, for there is little doubt much can be done with open stages that cannot be accomplished by closed-in tubes for the objectives. The open stage works much cooler also, and permits of the light and its adjustment being more easily manipulated.

T. N. ARMSTRONG.

THE MACDONOUGH PROCESS OF COLOUR PHOTOGRAPHY.

At the recent Milwaukee Convention of the Photographers' Association of America, Mr. Mark Forrest discoursed on the subject of the MacDonough Process of Colour Photography. He pointed out that light is the sensation produced by a luminous ray upon the retina of the eye, and the stimulation of the retina gives rise to the sensation of colour. This sensation of colour is due to the fact that the luminous rays have different rates of vibration, that is to say, that the rays travel in waves. The red waves are the longest, about thirty millionths of an inch. The violet rays at the other end of the spectrum are the shortest, about fifteen millionths of an inch; and every other colour, or possible variation of colour, lies between these two extremes.

Now, these vibrations or waves of light impress the brain with a sense of colour by their independent action upon what are called the nerve-fibrils, and these nerve-fibrils are variously affected according to the length of the light waves that reach them. They are practically divisible into three sections—one section is most sensitive to the longest rays and reflects to the brain a sensation of red, another section is most sensitive to rays of medium length and reflects to the brain a sensation of green, another section is most sensitive to the shortest rays and reflects to the brain a sensation of blue. When these nerve-fibrils are wholly unaffected—as when, for instance, one is wholly in a darkened room—the brain is

impressed with a sensation of blackness, which is the utter absence of colour. When the nerve-fibrils are equally affected, the resultant impression is that of white, which is the presence of all the colours. When the nerve-fibrils are unevenly affected, the resultant impression is that of a compound colour.

Observe that we have been referring to red, green, and blue as being the three primary colours, for the old theory that the primaries were red, yellow, and blue has been scientifically demonstrated to be incorrect. Yellow has been proved to be a compound of red and green. From red, green, and blue all other colours can be formed, and only by a combination of red, green, and blue can pure white be obtained.

It was along the lines of this theory that MacDonough worked, but one of the greatest difficulties he had to contend with was a means of properly decomposing a ray of light before it struck the sensitized surface of the plate. He first tried to stipple a screen by spattering it. He attained the result of properly decomposing the light, but found the method was impracticable because the irregularity of the marking made duplicates impossible, and he could not, of course, make a separate taking screen, by hand, for every picture.

At last he struck upon the plan of ruling the screen with equidistant lines of the three colours, and that is the form which is now used. It is difficult, however, to convey a clear impression of the fineness of the lines, which are ruled from 300 to 600 to the inch, so that the colour of the lines is only discernible through a powerful microscope.

Now let us suppose that you have your camera ready and want to take a picture by this process. There's no secret about it, nor is there the slightest difficulty of manipulation at any stage of the process. A ruled screen, called the taking screen, is inserted in front of the plate, perfect contact with which is ensured by moving a little lever at the side. On the front of the lens you place a chromatic balance shutter, whose object is to regulate the blue in the atmosphere, dependent upon the conditions of sunshine or shade, blue being the most actively actinic colour, and the one that is always most difficult to control. The shutter is made of three layers of coloured mica. By shifting the movable sections the operator can increase or lessen, at will, the proportion of blue in the light that enters the camera.

Now, when the light enters the lens, the taking screen splits up the ray into its component parts, just as a prism does, though in a different manner, and absorbs or transmits just so much of each of the three primary colours as is necessary to exactly duplicate the colour of the object. Suppose, for instance, you are photographing a piece of yellow cloth; now, yellow, as I have stated, is a compound of red and green. Accordingly, the red and green lines each transmit just so much of each as is necessary to make that particular tone of yellow; if it is an orange yellow, the red transmits more than the green; if it is a greenish-yellow, the green transmits more than the red. And so with every other colour or possible variation of colour.

When the plate receives the image of the object, it also receives an impression of the colour-value lines from the taking screen. From the negative a positive is made. Then a viewing screen, ruled in exactly the same fashion as the taking screen, except that the blue lines are a little lighter, is adjusted so that the lines exactly agree, and the whole picture immediately flashes into colour.

Now we come to the pictures; but, in viewing them, we must bear three things in mind:—

First, that, from first to last, the colouring is obtained by purely scientific means. No man's hand has doctored any of them with a paint brush, but the colour is purely dependent upon the decomposition of light.

Secondly, that these slides will illustrate merely a few of the many ways in which the process can be turned to commercial account. Some of the slides will be of interest for their beauty mainly, but there is hardly any form of business in which colour plays a part in which this process cannot be turned to better account for advertising and similar purposes than any other form of colour-reproduction that has hitherto been known.

And the third point is its value as a means of graphic education. In pathology, geology, astronomy, chemistry, botany, architecture, in fact, in almost every conceivable department of human knowledge, the use of such pictures as we are about to show you can be demonstrated to be of enormous value.

Mr. Forrest then described the pictures as thrown upon the screen, and, when the portrait of Mr. Tripp was produced, said: "And now, before going further, I want to say a few words about some of the little group of men whose faith and zeal encouraged MacDonough in his work, and have sustained the burden of that work since he died. This is a por-

trait of Mr. Dwight K. Tripp, the President of the International Colour-Photo Company. The value of his aid and service in connexion with this wonderful work it is hardly possible to over-estimate. To his fine faith in the feasibility of MacDonough's ideas and plans, and to his persistent encouragement and able care of the financial end of the enterprise, the success of his method is very largely due. Under every stress of discouraging circumstances, his confidence in the ultimate success remained unshaken, and it is largely due to him that the MacDonough process has now obtained recognition as an artistic method of registering the colour beauties of nature that is pregnant with the most wonderful possibilities."

PHOTOGRAPHY AND THE JAPANESE.

THE Camera Club *Journal* for September (to which we refer elsewhere in this week's JOURNAL) contains the report of a lantern lecture on Japan in April last by Mr. J. W. Groves, F.L.S., who, it is stated, exhibited a most comprehensive collection of lantern slides, some of which were from his own negatives, but the majority were commercial slides purchased in Japan and coloured with exquisite delicacy by native artists. He also showed some collotype prints, made by "Ongatoo," in Tokio, from photographs taken by himself in Kashmir, and both the slides and the colotypes were typical of the high degree of excellence to which the Japanese workers had attained in these as in other arts. The photographs illustrated in a very thorough manner the appearance of the country, the dress, customs, industries, and amusements of the people, and many details of every-day life.

The Chairman of the meeting, Mr. Arthur Diósy, in the course of some interesting observations, told his hearers he had had a very wide experience of photographic slides of Japan, having seen many hundreds of them, but he had never seen a collection which represented Japan and the Japanese more completely and truly than those which had been exhibited by Mr. Groves. They represented Japan in a twofold sense, first, because the subjects chosen and the skill with which the work had been done—both by Mr. Groves and by the native photographers, by whom some of the negatives had been taken—were the right subjects and the right skill for making true pictures of the country; and, secondly, because, when one compared the gruesome things that were usually produced in Europe as coloured lantern slides with the beautiful pictures which had been shown upon the screen, one was enabled to form an idea of the degree of true art which was the innate possession of every Japanese, for the Japanese were born artists. The excellent coloured slides which had been exhibited could be bought in Japan for about sixpence each, and the man who received fourpence each for colouring them was a truer artist than many men whose pictures were hung on the line at the Academy. The Japanese had an innate hatred of the ugly and an innate appreciation of the beautiful. Frequently, when he had been travelling in Japan, his bearers had stopped, not for the purpose of shifting the pole from one shoulder to the other, but to get a good long view of a beautiful spot, just as in this country they would stop for a good long pull of liquid refreshment. A whole library might be written on the "tags" furnished by Mr. Groves' slides. The photographs of Japanese women that had been shown were typical of the lower class, the lower middle class, and the geisha class, and not of the upper class, because it was exceedingly difficult to obtain a portrait of a Japanese lady under circumstances that would warrant its reproduction as a slide. The upper classes in Japan had a peculiar and very highly refined type of countenance of their own; the geishas, although generally of low origin, from their long training and education, to a certain extent acquired the look of the upper classes, but they never exactly resembled them. The geishas did not in every case take to a bad class of life, and they were no more obliged to do so than is an European actress. The life of a geisha offered abundant opportunities and temptations, just as did life on the stage in this country, but he would be very sorry to say that life behind the footlights was inseparable from immorality; in fact, his own connexion with the stage had made him know better. He knew several highly respectable married geisha ladies in Kioto, who derived a large income from their profession because they were clever, very well educated, and excellent conversationalists. The geisha was supposed to be able to sing and recite well, and to play well on the samisen, and to interest the man to whom she was talking. The secret of a geisha's success was the same as the secret of the success of a flirt in this country—she must be able to make the man to whom she is talking believe that he is the only man in the world. As to Japanese women as a whole—geisha, or dancing girl, or singing girl, or tradesman's wife, or lady—no photograph that could ever

be taken could do them justice even in the faintest degree, for their charm lay in essentials that could not be reproduced by photography. It lay in the wonderful lustre of their eyes, in the beautiful gloss of their jet-black hair, in the satin smoothness and softness of their skin, in the exquisite grace of their hands, fingers, and wrists, and particularly in their admirable grace of movement when seated, and in their beautiful silvery voice.

THE BAROMETER OF POPULARITY.

A REPRESENTATIVE of the *Daily Chronicle* has been making inquiries into the supply-and-demand aspect of photographing celebrities, and among those he addressed himself to were Messrs. R. Stanley & Co., wholesale distributors of photographs in this and other countries.

A member of the firm, he writes, not only gave him the benefit of his general experience, but even showed him some of the orders he had recently received from shops.

"Do you find that Generals are 'going off' in public favour?" I asked.

"Yes, very much so; the retail trade seems satisfied with the stock it already has in hand."

"Who provided the most lucrative subject in this particular line?"

"Baden-Powell, unquestionably first; Roberts second; and perhaps Kitchener third. But Kitchener was run very close by Generals Symons and White. You see, they were to the front in the early stages of the war, when the demand for photographs was at its height; moreover, they are both very good-looking men. General French is another of our handsome Generals who sold well."

"Good looks, I suppose, counted with lady purchasers?"

"To some extent; but I fancy that patriotism—that is to say, admiration of success—counted more."

"Apart from the war, what has been your best line of subject?"

"That is difficult to say, because the demand is so uncertain; I do not believe there is any trade in which this characteristic of uncertainty is so marked. Apart from popular actresses, we never know how we stand from week to week. Royalties, of course, are more steadily in demand than any other class. Public events give rise to a temporary boom. For instance, we could not supply orders for the late King of Italy fast enough. My trade is particularly typical of the uncertainty of the demand. Now, look at this order, which I received yesterday from shopkeeper in the States—from Boston. He orders:—One King of Servia, one Earl of Clarendon, two Duchess of Marlborough, two Empress Frederick, two King Humbert, one Blowitz, three Kruger, and three Lady Randolph Churchill. Of course, this is the outcome of special orders of certain customers, but they are characteristic. Last week I had quite a run on members of the Rothschild family, for no apparent reason. This week I have had a mysterious order for a set of photographs of the summer and winter residences of all the crowned heads of Europe. This is probably for a magazine article. Among authors, we have a steady demand for Blackmore and George Meredith, but neither of these can be supplied in the ordinary course of business."

"And how about the stage?"

"By far the largest demand at present in this department is for Edna May and La Cavaliera, and it appears that ladies quite as much as men purchase these and other photos of pretty women."

For further information as regards stage subjects he called on Mr. Alfred Ellis, of Baker-street.

"The demand for photographs of stage celebrities has fallen off very much in recent years," his representative told me. "Of course the war and the consequent demand for Generals accounts for the present condition of this branch of our trade. But, in any case, we are not likely to see a revival of the days when Mrs. Langtry's portraits had such a phenomenal sale."

"What have you done most of in recent years?"

"I cannot for the moment say for certain; but, unquestionably, we had for a time to meet a very large demand for Miss Dorothea Baird as Trilby. This was the result of a 'boom,' and consequently was only of temporary duration."

In a recently published article in an American magazine the writer, a well-known American journalist, stated that, when visiting the quarters of the British officers held as prisoners in Pretoria, he found the portrait of a certain London actress hanging over most of the cots. The statement probably came as a surprise to English readers, and, judging from inquiries incidentally made, London photograph dealers cannot account for such a large supply of this particular subject in a very limited area. Moreover, captured officers were not usually accompanied by personal baggage. It happens that the lady was very popular at one time in New York, and that the article was written mainly for the American public.

PHOTOGRAPHY AT THE GREENWICH OBSERVATORY.

annual report of the Astronomer Royal was issued recently. From the see that during the year ending May 10, 1900, 503 plates have been taken with astrographic equatorials on 118 nights. Of these, 136 have been rejected for the following reasons: 27 because the exposure interfered with by cloud, or because the images were too faint to show the stars of the ninth magnitude with a twenty-second exposure; 1 owing to faults in guiding or exposure; 14 on account of wrong focusing; 17 owing to imperfect printing of the *réseau*; 42 on account of defects in the photographic plates; and 14 from miscellaneous defects. In this it will be seen that something over twenty-five per cent. of the negatives were failures from one cause or other, not a very large percentage after all, seeing that nearly ten per cent. were due to faulty plates.

The report also shows the progress made with the photo-mapping of the heavens. For the Chart the number of photographs taken with two-minute exposures were 243, and the number of successful plates and the number of fields successfully photographed was 155. The total number of successful fields reported up to May 10, 1899 was 1027, of that number previously considered successful 106 have since been rejected, so that the total number of successful fields secured to May 10 this year is 1076, leaving 73 more to be taken.

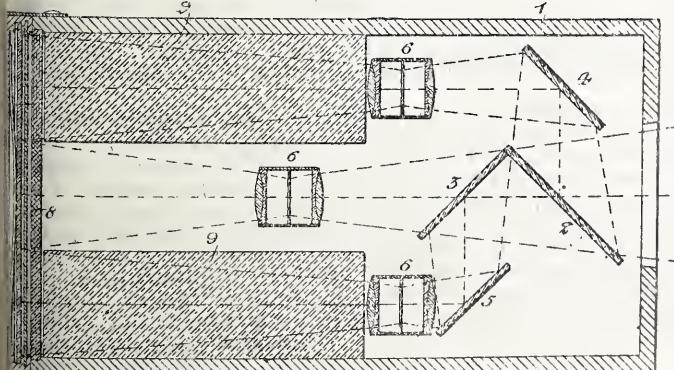
Last year it was found that many of the negatives previously taken had deteriorated, and had to be replaced, and this is now being done. Reference has already been made in the columns of the JOURNAL to the aged fading of the finest and more delicate details in gelatine negatives, and in the case of the negatives at the Observatory it is presumed that the deterioration has been caused by the damp in the building in which they were stored. One would almost have surmised that with negatives of such value as these they would not have been exposed to any such risk as that, because most of us know the effect of damp on gelatine negatives. It now seems that greater precautions are being taken to keep them dry in a place where they will not be exposed to the extremes of temperature they formerly experienced. If, as has been stated, the most delicate objects in these gelatine star negatives are liable to fade in the course of a few years, would it not be well, as a precaution, to at once reduce them by a permanent process—collodion, for example, that has stood the test for fifty years, or nearly so? We see from the report just issued that it is intended to prepare a full description of the Observatory, illustrated by photographs. This will be an interesting volume when it is issued, but it is not yet commenced.

IMPROVEMENTS IN PHOTOCROMOSCOPIC APPARATUS.

[Patent No. 12,181 of 1900.]

The object of the invention is to provide, in photochromoscopic apparatus, simple means for equalising the size of the three images produced from a single view point and disposed side by side in the same plane, or for the optical super-position, at a single view point, of three such images. In the present invention the cone of rays to each outer image is

FIG. 1.

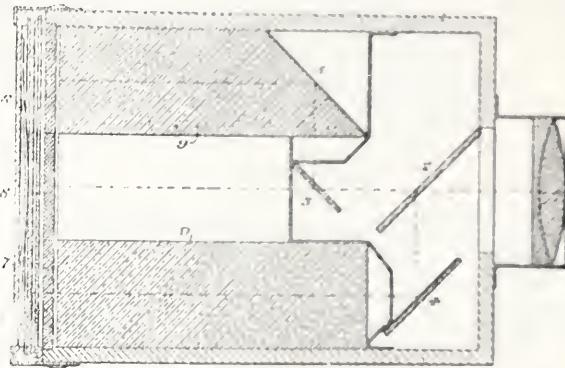


detached out and the focal point extended by introducing in the path of the rays a body of glass or other refracting medium, which, in technical language, "retards" the light ray. In fig. 1 the casing or box of the camera is represented at 1, while 2 and 3 are transparent inclined reflectors arranged in the path of the incident rays, the rays reflected from the plate 2 being directed on to an

inclined opaque reflector 4, and the rays reflected from the plate 3 being directed on to an inclined opaque reflector 5, so that all three series of rays will be directed rearwardly through suitable lens constructions 6 and will form images side by side upon a single plate contained in a plate holder 7 at the rear end of the box, the rays, before reaching the plate, passing through suitable colour screens 8.

The reflected rays which form the side images of the series also pass through rectangular blocks 9 of glass interposed in the path of the rays between the lens structure 6 and the plate, whereby the focal point of these side rays is extended to such an extent that the images formed upon the sensitive plate will all be equal and properly focussed. For instance if the axial rays to the outer images are two inches longer from

FIG. 2.

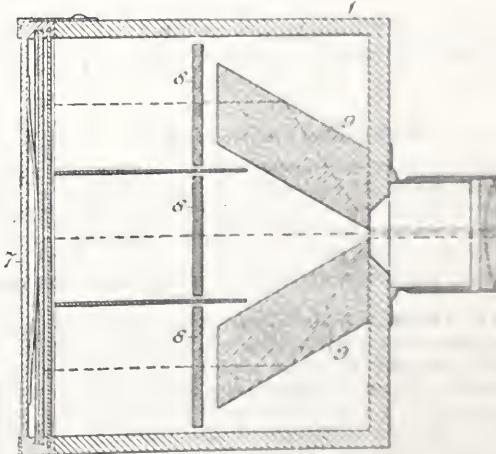


the view point than the axial ray to the central image, it is necessary to extend the focal point of the outer rays to the extent of two inches, and this may be accomplished by introducing in the path of each longer ray six inches of transparent substance having a refractive index of 1.5, which is approximately the refractive index of crown glass.

If a heavy silicate flint glass, having a refractive index of 1.66 is used, a length of slightly more than four inches will be sufficient, or in place of a solid block of refractive medium a glass tank of proper size and shape filled with a suitable liquid may be employed, as shown for instance at 9a in fig. 4.

In the construction shown in fig. 2 a single lens is employed at the front of the camera instead of the series of lenses within the camera, as

FIG. 3.



shown in fig. 1, and one of the refracting blocks 9 has a prismatic front end which may be silvered so that it serves the purpose of a side reflector 5.

The construction shown in fig. 3 illustrates the application of the present invention to a camera having points of view practically coincident, though in reality very slightly separated. Both refracting blocks in this case are prismatic and serve also as reflectors for directing rearward the rays for forming the outer images.

Mr. Ives adds, "It will be evident that in carrying out my invention two or more blocks of glass cemented together may be used in place of a single block, for instance in fig. 5 I have shown four blocks 9b used in this way, or the blocks may be separated from each other as shown for

instance at 9° , in fig. 6, or one or more rectangular blocks may be combined with a prism, or the said prism may be combined with one or more tanks or cells filled with liquid, for instance in fig. 7 I have shown a

FIG. 4.



FIG. 5.

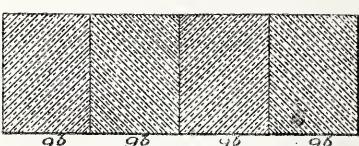


FIG. 6.

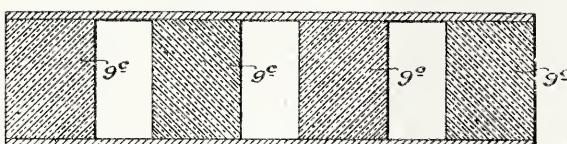


FIG. 7.

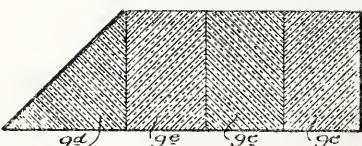
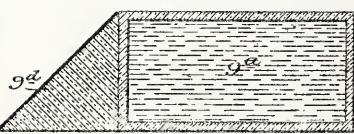


FIG. 8.



a prism 9° combined with three rectangular blocks 9° , and in fig. 8 I have shown the said prism 9° combined with a rectangular vessel 9° filled with liquid."

MONOCHROMATIC LIGHT.

THE importance of a monochromatic light in photographic research is becoming more appreciated by investigators in photometrics and sensitometry. Hence a digest of a recent exhaustive paper by MM. Charles Fabry and A. Pérot, in the *Journal de Physique, Théorique et Appliquée*, will be studied by those interested.

The authors take the various methods of producing a monochromatic light in turn :

1. *Filtration of a Beam of White Light.*—The employment of the very best absorbents gives very rough results. A spectrum may also be projected through a slit, and this is a method which, though the results depend theoretically only on the dimensions of the slit and the defining powers of the apparatus, yet possesses the defect that the brightness of the source thus obtained is feebler as the approach to perfection is greater. Even with solar light it is not easy to obtain a sufficiently intense beam, and in any case the apparatus is rather complicated, including a powerful dispersive apparatus and demanding extremely rigid construction throughout, if the wave-length of the luminous source thus produced is to remain constant throughout a given time. Further, except in the case of solar light, there are no points to which the wave-lengths can be referred.

2. *Light Emitted by a Gas.*—Luminous gases usually emit a light, the spectrum of which is made up of a certain number of brilliant lines. This light is therefore made up of several truly monochromatic lights superimposed, which latter can be separated more or less easily according as the radiations are less or more close together in the spectrum. In cases where they are fairly widely separated, absorbents can be used. In general, however, it is necessary to employ dispersive systems, which need not possess a great refinement, except when closely adjacent beams are

concerned. Certain special methods are then used, such as those based on the double refractive power of quartz, as pointed out by M. Mascart, which answers very well for the separation of the two D rays, which are separated with difficulty in other ways.

A gas may be rendered luminous in several ways. In any case, the temperature of the vapour must be raised, but the method of directly heating the enclosing vessel is never used, for it would give altogether too feeble sources of light. Other methods are introduction of the vapour into a flame, and illumination by an electric discharge of one form or another. The light emitted by a gas varies so greatly, according to the method of illumination, that no accurate results are possible (in the case of observing the spectrum of a metal, for instance) unless the exact circumstances are stated.

Flames are extremely unreliable as sources of monochromatic light. The light is not constant, and is generally feeble.

Gases or Vapours Electrically Illuminated.—This method is not new, for it is that used in the Geissler tubes. MM. Michelson & Morley have, however, recognised the remarkable property of the light emitted by these tubes, which, when containing metallic vapours, emit a relatively small number of very fine radiations.

A single tube can produce very different spectra, according to the conditions of electrical excitation. These differences are, no doubt, connected with the differences in temperature of the illuminated gas. The temperature should be much higher in the cases of rapid discharges than in those lasting a relatively short time. In this way the insertion of a condenser at an explosive distance reduces the fineness of the rays, whilst the excitation of the tube by alternate, or even by continuous, current gives radiations of remarkable fineness. When discharge occurs without disruption, only low-temperature rays are produced. With condenser and an explosive distance, the spectrum approaches that given by an induction spark in the air. It seems reasonable to suppose that the temperature is then much higher, the expenditure of energy having taken place in a much shorter time.

As the addition of a condenser gives rise to a certain number of new rays, the question arises as to the influence of the mode of excitation on the rays which are normally present. The points to be examined are as follows: What is the influence of the method of excitation of the tube on the wave-length, the fineness of the rays, the composition of those which apparently consist of several constituents, and in particular on the relative brightness of the components.

(1) *Bobbin with Condenser attached to the Secondary.*—The necessity of complete continuity in the discharge in order to obtain fine rays and definite wave-lengths led us to try other methods than this, in which this condition cannot be readily satisfied.

(2) *Alternate Current.*—The best results are obtained by alternating current of sufficiently high intensity. The light is very constant, the tubes last long, and there is no chance of trouble from a badly acting interruptor. The necessary current amounts to only some thousandths of ampères, but it must have a tension of about a thousand volts.

(3) *Continuous Current.*—The best result, from the point of view of fineness of rays and freedom from secondary components, is that given by the light obtained by connecting the two electrodes of the tube to a source of continuous current presenting a difference of potential of at least from seven to eight hundred volts. We use a battery of 500 small accumulators of 4 ampère-hour capacity, which can keep up the discharge for a very long time, since the current required is only three to four milli-ampères.

The illumination of the tube often calls for a difference of potential greater than that required for the excitation. We therefore permanently place in the circuit the induction apparatus known as the "pierce" of Brequet, in such a way that the electro-motive force produced adds to that of the battery. In order to regulate the current, we insert as well a resistance of a vessel of water in which dip two copper wires, the lengths of the immersed portions of which can be regulated. The light obtained is perfectly constant, easily adjusted, and the rays are extremely fine.

(4) *Electric spark,* for reasons which need not be given here in full, is not a very practical means of obtaining monochromatism.

(5) *Electric arc,* produced between a bath of mercury (positive electrode) and a pencil of carbon (negative electrode), is capable of giving very good results. Ultra-violet rays must be cut off with a solution of sulphate of quinine. Greatly superior results are obtained by producing the arc *in vacuo*. In order to obtain monochromatic light, when it is used under these special conditions, a solution of eosine is used to remove the green and violet; chloride of didymium removes the yellow chromate of potash, violet; and sulphate of quinine, the ultra-violet.

CHARLES FABRY AND A. PÉROT.

THE excavations that have been in progress for some months past upon the site of the ancient forum at Rome have resulted in quite a curious discovery. Under a large square flagstone there were found three weights of 20, 30, and 100 Roman pounds, dating from at least two centuries before our era. These weights, which are of irregular elliptical form, are of dark green marble, and provided with a bronze handle in order to facilitate their manipulation.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."

[October 5, 1900.]

THE LANTERN RECORD.

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LANTERN MEMS.

I HAVE seen the Royal Photographic Society's Exhibition, and must congratulate the Council on the excellence of it. For some years past many visitors to the Annual Show have felt that, no matter how excellent some of the exhibits were, photography was not adequately represented. In the New Gallery all this is changed, and not only are examples of pictorial, technical, artistic, and scientific photography well displayed, but in addition there are specimens of some of the finest enlargements and high-class portraiture it has been my privilege to see. These, together with a really good show of photographic apparatus, deserve the name of Royal.

* * * * *

ON the Soirée night one can only manage to take in the pictures at intervals, for there are so many friends to say a few words to, but what a contrast in the surroundings to the old days, what with ample room for everything, the delightful strains of music discoursed by an excellent band (the Royal Artillery, I think) the Gallery, the Exhibition room with lantern and screen. The smaller hall with the fine examples of enlargements, including the Kodak War pictures, and many well-known photographers' portrait work, also the central hall with the trade bays having typical and excellent collections of apparatus, and last the fountain "and the gold fish," as a well-known and popular Secretary sayeth.

* * * * *

LANTERNS there were, but these I could not inquire into, as time did not permit, but I hope to find some novelties and improvements when I visit the Exhibition next time. The electric light being on, it has been made available for use in the Society's optical lantern, and also for lighting up the stereoscopic slides in the revolving stereoscopes and the specimens of photography in colour. There are some good stereograms, but I must say that I think the old French glass stereoscopic slides with the regular focus lenses were more pleasing than those taken with the shorter-focus or wide-angle lenses. There may be something in the fact of the higher-power oculars showing up the grain of the film, but, any how, that was the first impression made upon me.

* * * * *

IF amateurs and those only slightly interested in photography do not flock to the New Gallery and become enthusiastic, I shall be surprised, but they will want an expert as guide, philosopher, and friend at their elbow if they are going to make a selection of a

camera, for the patterns are multifarious, and each has distinctive merits. A man that has had a year or two's experience will be in a better position, for he will know the shortcomings of his old camera and his average requirements, and so be able to narrow down the choice. The question of glass plates, flat films, or daylight-changing roll films will not be so easily disposed of; however, the exponents of each system and gentlemen in charge of the camera exhibits will, no doubt, clear the horizon, and, if the questioner cannot make up his mind, they will, no doubt, do so for him.

* * * * *

AMATEURS with limited time, and who do not mind paying for the development and printing being done by others, will continue to patronise the daylight roll-holder, for it has so many attractions, by reason of its simplicity and convenience, and, when the results are successful, gives great pleasure, for it becomes more fascinating on each occasion it is used, while those that have time will find agreeable occupation in developing. The advocates of flat films will grow in number as the excellent cameras for using them continue to circulate.

* * * * *

MY experience with the quarter-plate folding pocket Kodak in Holland was, on the whole, satisfactory. I like its convenient size and the method of focussing, but, for autumn holidays, and especially places where the principal buildings face north, it is necessary to be equipped with a walking-stick stand. The lens gives good results, but, for my own use, I shall have fitted a different form of finder, and I would advise a little spirit level to be fitted, it being a most useful accessory, and, in many cases, indispensable. Probably, as time goes on, a faster film will be produced for autumn use and places where brilliant sunshine cannot be counted on, for I suppose many Kodakers find their pictures are often under-exposed.

* * * * *

THE natives at the Island of Marken, which one visits from Amsterdam by a trip in a steam yacht, are very curiously dressed folks, and the children would be agreeably interesting if they had not become spoilt by their system of begging, or rather extorting, one might almost say, money from users of cameras. If a charge was made for the right to photograph on the island, it would be far better than the youngsters clambering round one for money the moment an exposure has been made. It was most curious to see them turn their backs on the parties having cameras, and those in boats, on a signal from others on shore, ducking down to hide themselves. This, however, was all altered the moment the pieces of silver were being put into the youngsters' hands; but, what was most sad was the quarrelling among themselves, and the striking of one another's faces if one girl had more than another, and it was impossible to have in one's pocket enough small silver to serve them all alike, and they would have nothing to do with division of the fee.

* * * * *

THE place is no doubt a show island, and, apart from the men, who are away fishing, I think the inhabitants realise that it pays

best to keep to their old costumes of embroidered or fancy waistcoats than to alter to more modern dress. Their spiritual or other advisers should look to it that so charming a place does not become the means by which the rising generation is degraded.

* * * * *

THOSE lanternists who have not already got a copy of the "Primus" Lanternist's Pocket-book should lose no time in securing one, for it is conveniently arranged, and the particulars given most useful to an operator, while the lists of requisites for a show are a capital aid to memory, and prevent, if checked before starting for an entertainment, some important item being overlooked. The particulars respecting the electric light will also be of interest to those that contemplate availing themselves of the electric current for the optical lantern.

G. R. BAKER.

LIVING LAMPS.

[Reprinted from the *Scientific American*.]

SOME years ago Dr. Raphael Dubois, of Paris, presented the writer with a photograph of the bust of Claude Bernard, which possesses an unusual interest, having been taken by the light of a phosphorescent insect—an elater—by M. E. Becquerel. The experiments and their details which led up to this were very interesting, but in this connexion it is sufficient to say that the picture was produced after an exposure of an hour to the rays of light of this small insect. Later M. Becquerel succeeded in taking a successful picture in twenty minutes, and another in two minutes, all of which is suggestive of the possibilities of the light produced by animals.

An excellent illustration of the splendour of the light of some of these insects is given by Professor Jaeger, the German naturalist, who says, "I feel particularly indebted to these little insects because during my excursions in St. Domingo they were frequently the means of saving my life. Often has dark night surrounded me in the midst of a dense forest on the mountain, where the little animals were my only guide." The light-giver referred to is Pyrophorus noctilucus, which is provided with three different lights; on each side of the thorax is an oval yellowish spot which emits a brilliant yellowish-white light, throwing the rays upward and outward, while between the metathorax and the first abdominal segment there is a lower light more brilliant than either; and, owing to their disposition, the light flashes almost continuously as the insect whirls along. The light appears to be controlled by the will of the animal, as, when the insect is feeding or eating, it is not seen, but becomes especially brilliant when the animal flies.

I have frequently experimented with these attractive little creatures in the South. The light when held very close to the large print of a book displayed the letters so that they could be read; the time of night was also told by holding the insect close to the face of a watch. The colour of the light was green. Dubois states that the eggs of a specimen kept by him gave out a bluish light. This naturalist found that the eggs retained their luminosity for a week, the light reviving when the eggs were placed in water. He produced luminous water by grinding the luminous organs to a powder and dissolving it in water, which at once assumed the appearance of molten metal.

The intensity of light is by no means in proportion to the size of the animal.

One of the most remarkable and brilliant light-givers I have ever observed was a marine worm, almost invisible to the naked eye; so small, in fact, that it would not be noticed by the casual observer. I have seen the surface of dark corners of a southern Californian bay dotted with seeming candle-lights, the effulgence of this minute creature. At first it was noticed on the bottom, forming a luminous spot as large as a fifty-cent piece; this rapidly increased until a light as large and as circular as a dinner plate appeared. So large and brilliant a light could seemingly be produced only by a large animal, but suddenly the light began to diminish, then rise from the bottom, coming up in a zigzag course, trailing blue, green, yellow, and

white flashes behind it until it reached the surface, where it rested, forming a phosphorescent light the size of a pea, but so bright that it could be distinguished thirty or more feet away. On certain warm nights I have seen the surface dotted with them. When disturbed, the spot swam off with a wriggling motion, emitting as it went the various-hued lights which seem to be thrown off as a luminous fluid. Yet this brilliant light-giver was a minute, almost invisible, worm.

The combined light of noctilucæ is often so brilliant that by constant irritation a light is produced by which large print can be read. A French naturalist on the African coast improvised a lamp of these living lights by taking a tube fifteen millimetres in diameter and placing in it noctilucæ, so that they formed a band at the surface twenty millimetres in thickness, when it was found that the light was sufficient to read large type by at a distance of two feet. To effect this, the animals were agitated with a stick; but, if a large number are placed in a glass of milk, they convert the glass into a white light, the intensity of which lasts several moments.

Another interesting example of a brilliant light I observed in a very small animal in the San Gabriel Valley. In walking just after nightfall, I noticed by the path an intense white light, which was found to be a minute myriapod, about a tenth of an inch in length, so small that I had difficulty in picking it up, though the light gleamed brightly. When it was finally secured, it was seen that the light was upon the head, while another, half as bright, was seen upon the tail. The head light was extremely beautiful, reminding one of a blazing match, and was continuous.

A number of myriapods are phosphorescent. Geophilus electricus of Europe is a light-giver, and often makes a magnificent display when suddenly uncovered, M. Audoin describing the soil as sprinkled with gold where he disturbed them. One of the most remarkable displays from these insects was observed by Mr. B. E. Brodhurst, who says that the light was so brilliant that he first observed it twenty paces away. It resembled an electric light in its brilliancy, and was produced by two centipedes and the luminous train they left behind. "The light illumined the entire body of the animal, and seemed to increase its diameter three times. It flashed along both sides of the creature in sections, there being about six from head to tail between which the light played. The light behaved precisely like the electric light, moving, as it were, perpetually in two streams, one each side, and yet lighting up the whole body. The trail extended from one and one-half feet from each centipede over the grass and gravel walk, and it had the appearance of illuminating mucus."

It is possible to read by the light of the humble earth worm. One of the most brilliant displays of animal phosphorescence I have observed came from such a source. Its discovery was accidental. In passing through an orange grove one rainy night in Southern California, I kicked aside a large clump of earth, when, to all intents and purposes, a mass of white molten metal went flying in every direction, affording an unusual display. The cause of the light was a single, possibly two, earth worms, not over two inches in length. The luminous matter was exuding from them and had permeated the surrounding soil, rendering it phosphorescent. The light-emitting mucus came off upon my hands, and the light lasted several seconds, gradually fading away.

Possibly the most remarkable light ever used for purposes of reading is the beautiful Pyrosoma, a columnar, jellylike creature, one of the free-swimming Tunicates. They are usually from one to two feet in length and three or four inches across, open at one end. The column is an aggregation of animals, each of which takes in water and expels it by an orifice in the interior, and this volume of water rushing from the open end propels the animal along. Its luminosity is wonderful, its name—fire body—well chosen. To illustrate its intensity, a Portuguese sea captain secured six of the animals, which he placed in glass jars, which were suspended from the ceiling of his cabin. By their own light he wrote a description of their beauties. Bennett, the English naturalist, placed a deep-sea shark, of the genus *Isistius*, in a jar in his cabin, and could easily have read by its light, describing the appearance of the fish as truly ghastly.

LANTERN NIGHTS AT THE R.P.S. EXHIBITION.

DURING the Course of the Exhibition at the New Gallery, Regent Street, there will be displays by means of the optical lantern, every Monday, Thursday, and Saturday evening. As below:—

- Sat., Oct. 6. "Viterbo, Spolito, Perugia, and Assisi," by J. COOPER ASHTON.
 Mon., " 8. "Round about the Matterhorn and Aletsch Glacier," by HENRY SPEYER.
 Thur., " 11. Illustrated Lecture on Colour Photography, by E. SANGER SHEPHERD.
 Sat., " 13. "Gleanings," by EDWIN DOCKREE.
 Mon., " 15. Sundries, chiefly pastoral, by Colonel J. GALE.
 Thur., " 25. "Venice, its Churches and Palaces," by J. J. VEZZEY. Illustrated by slides principally by Commander C. E. GLADSTONE, R.N.
 Sat., " 20. "Through County Donegal with a Camera," by HARRY SELBY.
 Mon., " 23. "Illustrated Lecture on Colour Photography," by E. SANGER SHEPHERD.
 Thur., " 25. "The islands and Highlands of Scotland," by JOHN A. HODGES.
 Sat., " 27. "Wonders of the Paris Exhibition," by S. J. BECKETT.
 Mon., " 29. "On the Peninsular Coast with a Hand Camera," by R. CHILD BAYLEY.
 Thur., Nov. 1. "Some Swiss Pictures," by JOHN GUNSTON.
 Sat., " 3. "Illustrated Lecture on Colour Photography," by E. SANGER SHEPHERD.

The ordinary lantern displays will be preceded by an Exhibition on the screen of examples of the various processes of Colour Photography.

LIMELIGHT MATTERS.

CONSUMPTION AND WASTE OF GAS.

It is a well-recognised fact in limelight working that, when an increase of light is desired, more heat must be generated by the blowpipe or jet to get it, and this increase of heat, in turn, can only be obtained by consuming more gas. It therefore follows that a really brilliant light cannot be produced without burning a sufficiency of gas to generate the necessary heat to obtain it. In carrying this simple principle into practice in such a manner as will enable the best possible amount of light being obtained without waste or unnecessary consumption of gas, very much will depend upon the condition of the apparatus that is being used and the care of the operator manipulating same.

The remark is still frequently made by old limelight operators, that more gas is used at the present day in working from cylinders than used to be the case when working off bags, and, no doubt, this is perfectly true. In the old days of gas-bags, an operator knew to almost a certainty the amount of gas he had under his control, and could always tell pretty well as he went along how his supply was holding out, and, if necessary, manipulate his taps to economise gas in the event of his running short.

With gas-bags, also, nothing like the same amount of pressure was used upon the tubes or jet fittings as we see regularly employed from cylinders at the present day, for, with gas-bags and the forms of jet commonly used years ago, a water pressure of about twelve to fourteen inches was sufficient pressure for the jets then in use; roughly speaking, this amount of water-tube pressure means something like a pressure of one half-pound per square inch. Compare with this the very great increase in pressure which it is now found necessary to employ with modern jets and regulators (a pressure which in some instances actually runs as high as fifteen pounds per square inch), with one particular form of jet to get the best results out of it, down to what may be called the minimum pressure of regulators set at two pounds per square inch for ordinary jets, and it will be seen in a moment that if, as was the case in the days of gas-bags, so much care was bestowed in seeing that everything was drum-tight in connexion with the bags and tubes, and that no gas escaped elsewhere than through the nipple of the jet, how much more so is such care necessary when using modern apparatus from cylinders.

No doubt, to a certain extent, the introduction of cylinders has tended to foster among operators an amount of indifference to what may be termed "slight escapes of gas," that would never have been tolerated with gas-bags. This very often arises, no doubt, from the fact that, with the knowledge a full cylinder of gas is being pulled upon, a mere slight escape somewhere or other is a matter of no great importance. These slight escapes, however, are of importance in many instances, and not only mean a serious waste of gas, but also pollute the atmosphere of a lecture hall, and in the case of hydrogen or coal gas are dangerous should any light come in contact with such leakage. Indifference to such matters means a slovenly worker, and, as a general rule, such workers never succeed in getting high-class results.

The various sources to which an escape of gas can be traced in limelight working are more numerous than many might imagine, and, speaking generally, each and all of these sources are under the entire control of a careful operator.

Considering the wear and tear to which gas cylinders are subjected, and that their valves are at the mercy of Tom, Dick, and Harry, here, there, and everywhere over the country, it speaks volumes for the care bestowed by our leading compressing companies that they are sent out in the perfect condition in which the public receive them, for such a thing as a leaky cylinder coming direct from the hands of a compressing company is now almost unheard of. To those not acquainted with the method of procedure employed by the pumpers it may be briefly stated that, whenever a cylinder is fully charged with gas, the valve is closed, the cylinder raised on end, and the cup or nozzle of the cylinder is then filled with water; if the valve is not tight, the water at once shows the escape of gas, and such cylinders are at once blown off and set aside for repair. Further, it is only fair to state, on the part of most of our leading firms of opticians who cater largely for the public in limelight working, that this method is also followed by them. Perhaps there is no greater disappointment to be met with in anything than that which follows a breakdown in a limelight entertainment through the failure of a gas supply. Accidents, of course, will happen, and empty cylinders have been known to have been sent in the belief that such were fully charged with gas; but so impressed have several of our leading firms in the West of Scotland become with the importance attaching to this matter, that they guard against the possibility of disappointment, and break down by appointing special gas men in connexion with their business, whose sole duty is to gauge and test every cylinder before it leaves their premises, and such men are personally responsible for the tightness of the valves and the contents of the cylinders being what is stated in the accompanying certificate.

Speaking generally, it may be taken for granted that all serious wastes of gas occur after the cylinders reach the hands of the users. Although so much care must be admitted as due to our various compressing companies in regard to the tightness of the valves, there is, however, another matter which is more liable to escape their notice, and which at times is responsible for a serious waste of gas, as well as giving a large amount of annoyance to those using the cylinders. In transit especially, when the cylinders are known to be empty, sometimes a nozzle of a cylinder comes in for very rough usage; and occasions do arise where new and slightly worn threads to regulators or fine adjustment taps, make it a matter of no little difficulty to so attach such regulators or taps to the nozzle of the cylinder without a serious escape of gas.

This is just one of the points that goes far to prove the advantage of any one possessing their own cylinders and attachments of every kind. Of course, in the broad run of limelight work such is impracticable; but it goes far to show how much care is necessary in seeing to everything beforehand. A careful operator will take nothing for granted before he sets out on any important commission, and will test everything, even to the screwing on of his taps, or regulators, on the cylinders he is going to use. This, however, is a fruitful source of waste of gas. A gas-tight connexion between cylinders and regulators, or taps, ought to be always provided for, and, as an aid to this end, soft metal-washers have been introduced, which are not nearly so much in use as they deserve to be.

It has been pointed out that, with the increased pressure necessary with modern apparatus, the strain upon rubber tubes and taps is at times very great, and if there is any crack or weak part in a rubber tube it will soon make its presence felt. Somewhat in recent years a flexible metal tube has been in use for high-pressure work. There is no doubt as to this sample of tubing standing an enormous pressure; but the old and time-worn rubber tube takes a lot of killing, and will be employed yet for years to come. There is no doubt, however, such, if not carefully used, is very liable to waste gas. A careless operator will blow off his tubes over and over again without for a moment giving a thought to

the amount of gas he is wasting. With gas-bags this was looked upon as a serious matter, but it is passed over lightly when working from cylinders.

Another fruitful source of waste of gas is often met with in faulty jets. As is the case with most mixing jets, after being used for a time, the leather washer on the top of the mixing chamber becomes worn out by reason of the great heat the leather has been subjected to, and any unscrewing of the cap of the mixing chamber is very liable to cause a badly fitting joint. When the jet is subjected to a high pressure when next being used, an unsuspected escape of gas is very liable to occur at this part.

Passing from wastes that may be termed attributable to faulty connexions and apparatus, we next have to consider the matter from the standpoint where such waste is clearly attributable to carelessness or want of knowledge on the part of an operator. A thoughtless operator will soon make his presence felt by noise of some kind or other. This may take the shape of hammering on his connexions with the cylinders in such a manner as would lead one to expect he was driving home a rivet in the hull of an Atlantic liner. Then, again, there follows a succession of hisses from the nozzles of his cylinders, in which he takes a delight, as it were, to let every one know, "I'm all here, and have plenty of gas to spare," never thinking that people have nerves, or of the amount of gas he is wasting every time he is opening the valves of his cylinders.

In what may be termed the consumption of gas, pure and simple, it is surprising the difference that will take place, using the same apparatus, by two different operators. In the one case, where a man knows his business thoroughly, a really brilliant light will be obtained, with no fuss or noise and with a really moderate consumption of gas. On the other hand, an inexperienced operator will frighten all nervous people in his vicinity by a series of hisses and snap-out explosions, never really obtaining a brilliant, steady light, and will run through double the amount of gas that is necessary.

It is well known that one of the most important items in connexion with the getting of a good light lies in the knowledge of being able to adjust the lime at its proper distance from the orifice of the jet, and it seems strange that so much that is misleading should be written, from time to time, on this subject by would-be experts in limelight matters.

To judge from much that has appeared in the public prints regarding this important point, many might imagine that in every case the distance from the lime to the jet was almost a fixed factor, averaging about one-sixteenth of an inch distance with every jet that is being employed. The fact, however, is, this distance is governed by two factors, viz., the aperture and pressure employed on a jet, and the pitch of the nipple.

With every jet there is a distance from the orifice where the mixed gases may be said to form their hottest focus. This hottest point generally lies just inside the blue or oxidizing part of the current of the gases, and with large orifices, where a good pressure is being used, the farther from the orifice will this heat focus be situated.

Again, with some jets in which the angle or the set of the nipple is inclined to less than about forty-five degrees, the best results will be found when the lime is brought more closely up to the orifice, for with such jets the gas impinges over the face of the lime and yields a broader patch of incandescence than when a jet is set to an angle of about forty-five degrees. The fact is, every jet should be tried and tested for the heat focus, according to the aperture and pressure applied from the regulator when working at its best; and, if economy in gas is aimed at, as this pressure is cut off by the taps, so must the lime be brought nearer to the orifice.

A good deal has been written from time to time about the black spot; this signifies that the lime is too close to the orifice of the jet for the amount of gas that is passing. This black spot is an unerring guide, and should never be allowed to continue, for it means a chilling of the lime by reason of faulty adjustment.

The great aim on the part of an operator should be to obtain the greatest possible amount of heat concentrated on one part of the lime without waste of gas, and this is only obtained by so adjusting the lime to the jet as will provide for its being just on the confines of the blue or oxidizing part of the current.

There is far more in being able to manipulate a powerful limelight jet than many imagine; with the gases properly adjusted by the taps and the lime set at its correct distance from the orifice of the jet there will also be less trouble from heating the shell of the lantern, and also less liability to fracture a condenser than is the case where the gases are improperly regulated and an excess of hydrogen is being wasted to no purpose.

T. N. ARMSTRONG.

BORDIGHERA.

[Notes of a Lantern Lecture delivered at the New Gallery, Regent-street, Monday, October 1, 1900.]

The short time at my disposal must necessitate brevity; in fact, only a running commentary as the pictures pass the screen.

Bordighera is about a couple of miles east of Ventimiglia, the frontier between France and Italy. To any one wishing a quiet, healthy winter residence I can heartily recommend Bordighera. Sheltered from the north by high mountains, towards the east it is somewhat flat, consequently there is more sunshine by an hour or more than is obtainable at Nice or Monte Carlo. Fast trains run daily to Monte Carlo in less than no time, as French time is kept at Monte Carlo and Italian time at Bordighera.

Her Majesty the Queen intended spending her usual spring holiday at Bordighera, but from political reasons the Continental trip was abandoned. The Empress Frederick stayed at the Hôtel Angst all the previous winter, and report says that she was so pleased with all the arrangements that she induced the Queen to entertain a residence there.

Bordighera is fast becoming Anglicised. Some noted Englishmen have villas there. Lord Strathmore has a lovely château. Dr. George McDonald has a fine large villa also. He has spent about twenty winters there. This speaks well for the climate. In a short time the English will want to be enfranchised.

Hotels are good and numerous. Charges moderate; good pension terms can be had from seven francs a day. The English community are well looked after spiritually and spirituously. There is an English church about to be enlarged, Dutch Protestant church, and, of course, a Catholic cathedral and other churches.

A very agreeable Vice-Consul in the person of Mr. Ed. Berry, banker and agent for Cook, has a large general store, where good Scotch can be had. A well-appointed reading-room is attached to the bank, where most of the English daily and illustrated periodicals are free for the use of visitors. Carriage drives are plentiful, and the charges moderate. There are many pretty little rock villages well worth visiting. William Scott has written and illustrated a work on *The Rock Villages of the Riviera* (A. & C. Black). To one making a flying visit, consult Baedeker and Black.

Clarence Bicknell, the great botanist, has published two works on the flora, besides building and furnishing a free library and museum in a lovely situation amidst tropical vegetation. The library contains over 6000 volumes in five languages.

Many of the pictures which will be shown to-night will appear in the *Traveller*.

A. L. HENDERSON.

THE PHOTO-MICROGRAPHIC ROOM AND APPARATUS IN THE ANATOMICAL LABORATORY OF THE JOHN HOPKINS UNIVERSITY.*

THE scope of photo-micrography can conveniently be divided into photo-micrography (1) with high powers, (2) with medium powers, and (3) with low powers.

1. Photo-micrography with high amplification (600 to 1200 diameters) is employed chiefly for the study of micro organisms and fine histological structures.

2. Photo-micrography with medium amplification (150 to 400 diameters) is applied to tissue work, where it is desirable to differentiate structural elements in pathology as well as in normal histological material, micro-urinary deposits, and the study of vital movements (amœboid) of certain cells by serial exposures.

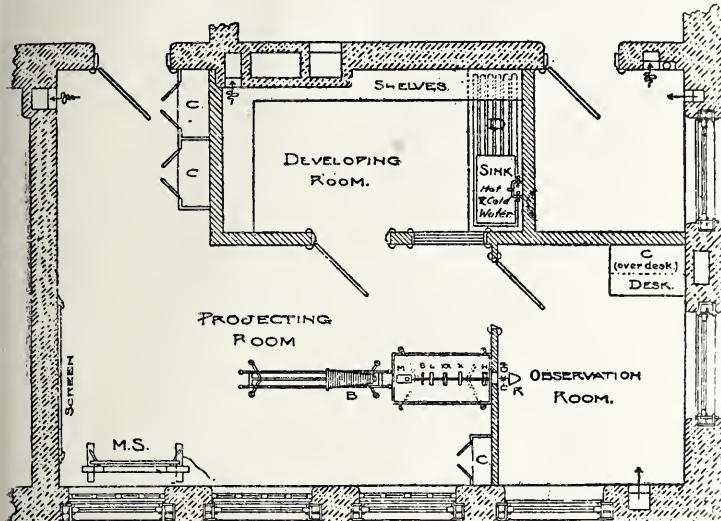
3. Photo-micrography with low powers (1-100 diameters) is applied in the study of various tissues with reference to their anatomical relations, and for injected specimens of whole organs.

It was with the above uses of photo-micrography in mind that the rooms and apparatus, described in this paper, were constructed and purchased. As seen in the plan, there are three rooms. The main room (Projecting room), is made perfectly dark by being painted dull, or flat black, and having the windows protected against the admission of light by three sets of blinds, Venetian blinds on the outside, an adjustable black cloth blind on the inside, and, over these, sliding panelled wooden blinds. It contains the tables carrying the condensers, microscope, camera, and the projecting apparatus consisting of a perfectly smooth plaster of Paris screen on the wall directly behind the camera and a small movable screen.

* A. G. Hoen, M.D., in the John Hopkins Hospital Bulletin, Nos. 62, 63, May June, 1896.

The second room contains all necessary chemicals and water supply, for developing plates, and conducting such other manipulations as appertain to photography. It is lighted by incandescent lamps, one of which, for photographic purposes, is hooded with black velvet over a frame of asbestos, and covered on the lower side by three thicknesses of deep ruby glass.

The smallest room (Observatory room) is well lighted, and contains 4000 candle-power electric arc, the light from which is projected by a

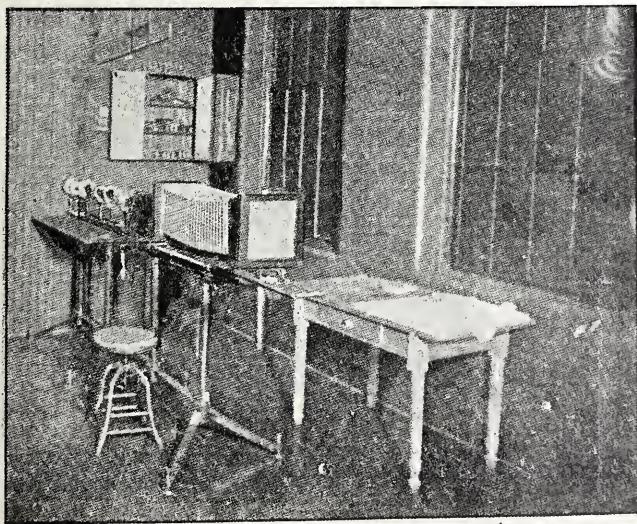


PLAN OF PHOTOGRAPHING ROOM

Feet 0 1 2 3 4 5 6 7 8 9 10
Metres. 0 1 2 3

c, cases. d, drip-board. ms, movable screen. b, bellows. m, microscope. s, specimen holder. l, light filter. xx, double convex lens. x, plano-convex lens. h, heat filter. *, electric light. r, reflector.

paraboloid reflector through an aperture in the partition into the apparatus in the large room. The arc lamp is mounted on a mechanical stage attached to the partition, which admits of vertical and lateral movements, so that it may be adjusted easily to the optical axis of the photo-micrographic apparatus. The carbon-holders are balanced by means of a



South-west corner of projecting room.

chain over a pulley in the lamp mechanism, the result of which arrangement with alternating current is that the combustion of the carbons is compensated by the descent of the upper and the ascent of the lower carbon in exactly the same ratio, and the arc is thus fixed practically at one point, remaining there from the time the current is turned on until the carbons are consumed. To overcome the considerable vibration of the carbon points, an adjustable guard is attached to the side of the lamp, to steady the upright rod of the lower carbon point.

The photo-micrographic apparatus consists of a special microscopic

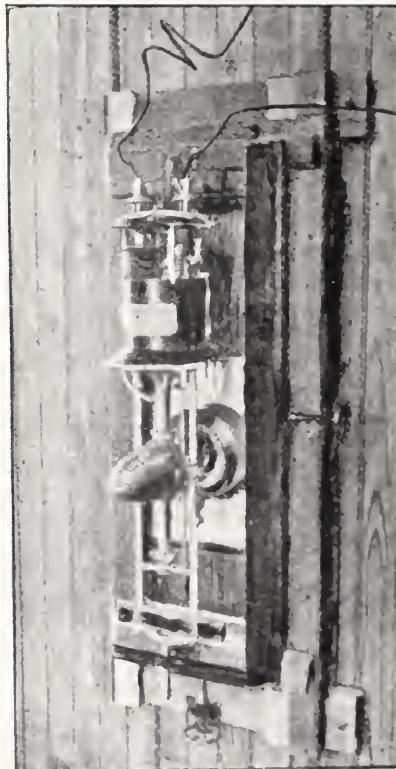
stand with 2, 2·5, 4, 8, 16, 35, and 70 mm. lenses, and Nos. 2 and 4 projection oculars. In addition to these are the following photographic lenses, which can be used for photographing with low powers, as well as for ordinary lantern projection :

Anastigmat 1:	6·3, focus 43 millimetres.
" 1:	7·2, " 96 "
" 1:	7·2, " 148 "
" 1:	12·5, " 260 "
" 1:	18·0, " 632 "

Besides these lenses, there is a complete projection table with its appendages, as well as the large camera. For delicate work there is a spectral illuminating apparatus after Hartnack. The anastigmat lenses are all interchangeable, and the large ones are fitted with a prism to photograph at right angles to the object, as is often necessary in photographing objects under fluids. An achromatic Abbé condenser is used, which, being supplied with two iris diaphragms, permits the use of entire aperture of the condenser, or only a fractional portion thereof.

As a means of bringing the two tables to an exact level, that the optical axis may be perfect, set screws are put into each of the iron pedestals of the table, these screws, resting in small metallic discs, which are simply laid on the floor in their proper position.

Two methods of illumination for high and medium powers are prac-



Heliōs electric lamp.

ticable. The first may be illustrated from fig. 1. The rays from the arc light (*) are received upon the plano-convex lens x, which is so placed that the arc is in its principal focus, thus rendering all rays passing through it parallel. In their further course through the bi-convex lens, xx, the rays are brought to a focus, which is made to coincide, by adjusting this lens on the sliding bar, with the principal focus of the lower lens of the Abbé condenser in the microscope (m). The lower lens of the Abbé condenser renders the rays parallel, while its second lens converges them and brings them to a focus in the plane of the object, giving there a small but very bright image of the source of illumination.

The second method consists in the use of a plano-convex lens of much shorter focus than the above. It is mounted in a metal frame, which is fastened to the wall, and, by means of set screws, permits of perpendicular and lateral movement. The collar is also movable in the optical axis, so that adjustment for accurately focussing the lamp is accomplished by means of the set screw, which is moved back and forth until a bright beam of light, not greater in diameter than the lens itself, is projected on the screen.

The light filter used is the bichromate of potash and sulphate of copper solution, as recommended by Neuhaus. It is made as follows :—

Sulphate of copper	175 grammes.
Bichromate of potash	17 "
Sulphuric acid	2 c.c.
Water	from 500-1000 c.c.

More concentrated solution is applicable to specimens stained very slightly with the various blues (haematoxylon and aniline, &c.), or with the reds, particularly safranine preparations. The position of the light filter is of little moment, provided that the rays of light which pass through it are the only ones which reach the Abbé condenser.

The plates used with greatest success are those made by the Cramer Dry Plate Company, of St. Louis, Mo. They are orthochromatic in the widest sense, are very uniform, and the instantaneous and extra-rapid plates made by this Company are sensitive to an exquisite degree. The development of the plates is accomplished as advised by, and after the formula of, the manufacturers, by a combination of hydroquinone and eikonogen.

C. W. J.

PHOTOGRAPHY AND ASTRONOMY.

[The following abstract from Dr. A. A. Common's address to the Department of Astronomy of the British Association deals with the aspects of Astronomy that are of more immediate interest to photographers.]

THE progress of the new astronomy is so closely bound up with that of photography that I shall briefly call to mind some of the many achievements in which photography has aided the astronomer.

Daguerre's invention, in 1839, was almost immediately tried with the sun and moon, J. W. Draper and the two Bonds in America, Warren de la Rue in this country, and Foucault and Fizeau in France, being among the pioneers of celestial photography; but no real progress seems to have been made until after the introduction of the collodion process. Sir John Herschel in 1847 suggested the daily self-registration of the sun spots to supersede drawings; and in 1857 the De la Rue photo-heliograph was installed at Kew. From 1858-72 a daily record was maintained by the Kew photo-heliograph, when the work was discontinued. Since 1873 the Kew series has been continued at Greenwich, and is supplemented by pictures from Dehra Dūn in India and from Mauritius. The standard size of the sun's disc on these photographs has now been for many years eight inches, though for some time a 12-inch series was kept up.

The first recorded endeavour to employ photography for eclipse work dates back to 1851, when Berowsky obtained a Daguerreotype of the solar prominences during the total eclipse. From that date nearly every total eclipse of the sun has been studied by the aid of photography.

In 1860 the first regularly planned attack on the problem by means of photography was made, when De la Rue and Secchi successfully photographed the prominences and traces of the corona, but it was not until 1869 that Professor Stephen Alexander obtained the first good photograph of the corona.

In recent years, from 1893 until the total eclipse which occurred last May, photography has been employed to secure large-scale pictures of the corona. These were inaugurated in 1893 by Professor Schaeberle, who secured a 4-inch picture of the eclipsed sun in Chili. These have been exceeded by Professor Langley, who obtained a 15-inch picture of the corona in North Carolina during the eclipse of May 1900.

Photography also supplied the key to the question of the prominences and corona being solar appendages, for pictures of the eclipse sun taken in Spain in 1860 terminated this dispute with regard to the prominences, and finally to the corona in 1871.

In 1875, in addition to photographing the corona, attempts were made to photograph its spectrum, and at every eclipse since then the sensitised plate has been used to record both the spectrum of the chromosphere and the corona. The spectrum of the lower layers of the chromosphere were first successfully photographed during the total eclipse of 1896 in Nova Zembla by Mr. Shackleton, though seen by Young as early as 1870, and a new value was given to the wave-length of the coronal line (wrongly mapped by Young in 1869) from photographs taken by Mr. Fowler during the eclipse of 1898 (India).

Lunar photography has occupied the attention of various physicists from time to time, and, when Daguerre's process was first enunciated, Arago proposed that the lunar surface should be studied by means of the photographically produced images. In 1840 Dr. Draper succeeded in impressing a Daguerreotype plate with a lunar image by the aid of a 5-inch refractor. The earliest lunar photographs, however, shown in England were due to Professor Bond, of the United States. These he exhibited at the Great Exhibition in 1851. Dancer, the optician, of

Manchester, was, perhaps, the first Englishman who secured lunar images, but they were of small size.

Another skilful observer was Crookes, who obtained images of 2 inches diameter, with an 8-inch refractor of the Liverpool Observatory. In 1852 De la Rue began experimenting in lunar photography. He employed a reflector of some 10 feet focal length and about 13 inches diameter. A very complete account of his methods is given in a paper read before the British Association. Mr. Rutherford at a later date, having tried an 11½-inch refractor and also a 13-inch reflector, finally constructed a photographic refracting telescope, and produced some of the finest pictures of the moon that were ever taken until recent years. Also Henry Draper's picture of the moon taken September 3, 1863, remained unsurpassed for a quarter of a century.

Admirable photographs of the lunar surface have been published in recent years by the Lick Observatory and others. I, myself, devoted considerable attention to this subject at one time; but only those surpassing anything before attempted have been published in 1896-99 by MM. Loëwy and Puiseux, taken with the Equatorial Coudé of the Paris Observatory.

Star prints were first secured at Harvard College, under the direction of W. C. Bond, in 1850; and his son, G. P. Bond, made in 1857 a most promising start with double-star measurements on sensitive plates, his subject being the well-known pair in the tail of the Great Bear. The competence of the photographic method to meet the stringent requirements of exact astronomy was still more decisively shown in 1866 by Dr. Gould's determination from his plates of nearly fifty stars in the Pleiades. Their comparison with Bessel's places for the same objects proved that the lapse of a score of years had made no difference in the configuration of that immemorial cluster; and Professor Jacoby's recent measures of Rutherford's photographs taken in 1872 and 1874 enforce the same conclusion.

The above facts are so forcible that no wonder that at the Astro-photographic Congress held in Paris in 1887 it was decided to make a photographic survey of the heavens, and now eighteen photographic telescopes of 13 inches aperture are in operation in various parts of the world, for the purpose of preparing the international astrographic chart, and it was hoped that the catalogue plates would be completed by 1900.

Photography has been applied so assiduously to the discovery of minor planets that something like 450 are now known, the most noteworthy, perhaps, as regards utility being the discovery of Eros (433) in 1898 by Herr Witt at the Observatory Urania, near Berlin.

With regard to the application of photography to recording the form of various nebulae, it is interesting to quote a passage from Dick's *Practical Astronomer*, published in 1845, as opposed to Herschel's opinion that the photography of a nebula would never be possible.

"It might, perhaps, be considered as beyond the bounds of probability to expect that even the distant nebulae might thus be fixed, and a delineation of their objects produced, which shall be capable of being magnified by microscopes. But we ought to consider that the art is only in its infancy, and that plates of a more delicate nature than those hitherto used may yet be prepared, and that other properties of light may yet be discovered, which shall facilitate such designs. For we ought now to set no boundaries to the discoveries of science, and to the practical applications of scientific discovery, which genius and art may accomplish."

It was not, however, until 1880 that Draper first photographed the Orion Nebula, and later by three years I succeeded in doing the same thing with an exposure of only thirty-seven minutes. In December 1885 the brothers Henry by the aid of photography found that the Pleiades were involved in a nebula, part of which, however, had been seen by myself (*Monthly Notices*, vol. xl. p. 376), with my 3-foot reflector in February 1880, and later, February 1886; it was also partly discerned at Pulkowa with the 30-inch refractor then newly erected.

Still more nebulosity was shown by Dr. Roberts's photographs (*ibid.*, vol. xlvi. p. 24), taken with his 20-inch reflector in October and December 1886, when the whole western side of the group was shown to be involved in a vast nebula, whilst a later photograph taken by MM. Henry early in 1888 showed that practically the whole of the group was a shoal of nebulous matter.

In 1881 Draper and Janssen recorded the comet of that year by photography.

Huggins (*Proc. Roy. Soc.*, vol. xxxii. No. 213) succeeded in photographing a part of the spectrum of the same object (Tebbutt's Comet, 1881, II.) on June 24, and the Fräunhofer lines were amongst the photographic impressions, thus demonstrating that at least a part of the continuous spectrum is due to reflected sunlight. He also secured a similar result from Comet Wells (*Brit. Assoc. Report*, 1882, p. 442).

The advantage of large primary images in photography is now fully

recognised. For all other kinds of astronomical photography a fixed telescope is admirably adapted; and so, with all spectroscopic investigations, a little consideration will show that the conditions under which these investigations can be pursued are almost ideal. As to the actual form such a construction would take, we can easily imagine it. The large mirror mounted as a ccelostat in the centre; circular tracts round this centre, on which a fan-shaped house can be travelled round to any azimuth, containing all the necessary apparatus for utilising the light from the large plane mirror, so as to be easily moved round to the required position in azimuth for observation. In place of a fan-shaped house movable round the plane mirror, a permanent house might encircle the greater portion round the mirror, and in this house the telescope or whatever optical combination is used might be arranged on an open framework, supported on similar rails, so as to run round to any azimuth required. The simplicity of the arrangement and the enormous saving in cost would allow in any well-equipped observatory the use of a special instrument for special work. The French telescope has a mirror about 6 feet in diameter and a lens of about 4 feet. This is a great step in advance over the Yerkes telescope, and it may be some time before the glass for a lens greater than 50 inches diameter will be made, as the difficulty in making optical glass is undoubtedly very great. But with the plane mirror there will be no such difficulty, as 6 feet has already been made; and so with a concave mirror there would be little difficulty in beginning with 6 feet or 7 feet. The way in which the mirror would be used, always hanging in a band, is the most favourable condition for good work, and the absence of motion during an observation, except, of course, that of the plane mirror (which could be given by floating the polar axis and suitable mechanical arrangements, a motion of almost perfect regularity.)

One extremely important thing in using silver or glass mirrors is the matter of resilvering from time to time. Up to quite recently the silvering of my 5-foot mirror was a long, uncertain, and expensive process. Now we have a method of silvering mirrors that is certain, quick, and cheap. This takes away the one great disability from the silver or glass reflecting telescope, as the surface of silver can now be renewed with greater ease and in less time than the lenses of a large refracting telescope could be taken out and cleaned. It may be that we shall revert to speculum metal for our mirrors, or use some other deposited metal on glass; but, even as it is, we have the silvered glass reflector, which at once allows an enormous advance in power. To do justice to any large telescope it should be erected in a position, as regards climate, where the conditions are as favourable as possible.

The invention of the telescope is to me the most beautiful ever made. Familiarity both in making and in using has only increased my admiration. With the exception of the microphone of the late Professor Hughes, which enabled one to hear otherwise inaudible sounds, sight is the only sense that we have been able to enormously increase in range. The telescope enables one to see distant objects as if they were at, say, $\frac{1}{500}$ part of their distance, while the microscope renders visible objects so small as to be almost incredible. In order to appreciate better what optical aid does for the sense of sight, we can imagine the size of an eye, and therefore of a man, capable of seeing in a natural way what the ordinary eye sees by the aid of a large telescope, and, on the other hand, the size of a man and his eye that could see plainly small objects as we see them under a powerful microscope. The man in the first case would be several miles in height, and in the latter he would not exceed a very small fraction of an inch in height.

Photography also comes in as a further aid to the telescope, as it may possibly be to the microscope, for a certain amount of light is necessary to produce sensation in the eye. If this light is insufficient, nothing is seen; but, owing to the accumulative effect of light on the photographic plate, photographs can be taken of objects otherwise invisible, as I pointed out years ago, for in photographs I took in 1883 stars were shown on the photographic plates that I could not see in the telescope. All photographs, when closely examined, are made up of a certain number of little dots, as it were, in the nature of stippling, and it is a very interesting point to consider the relation of the size and separation of these dots that form the image, and the rods and cones of the reckoner which determines the power of the eye.

Many years ago I tried to determine this question. I first took a photograph of the moon with a telescope of very short focus (as near as I could get it to the focus of the eye itself, which is about half an inch). The resulting photograph measured one two-hundredth of an inch in diameter, and when examined again with a microscope showed a fair amount of detail; in fact, very much as we see the moon with the naked eye. Making a picture of the moon by hand on such a scale that each

separate dot of which was made to correspond with each separate sensitive point of the retina employed when viewing the moon without optical aid, I found, on looking at this picture at the proper distance, that it looked exactly like a real moon. In this case the distance of the dots was constant, making them larger or smaller, forming the light or shade of the picture.

I did not complete these experiments, but, as far as I went, I thought that there was good reason to believe that we could in this way increase the defining power of the eye. It is a subject well worthy of further consideration.

Dr. A. A. COMMON, F.R.S.

ALPHA LANTERN PLATES.

[Reprinted from *Photographic Scraps*.]

THE production of lantern slides and transparencies is one of the most interesting branches of photography, especially in the dark winter evenings, when the pursuit of our art is almost limited to those processes which can be executed by artificial light.

The manipulation of the Alpha lantern plates is simple in the extreme. A short exposure, in contact with a negative, to gas or other similar light, followed by plain development and plain toning, give us a variety of tones which are applicable to almost any subject or effect desired, such as blue for a moonlight or snow effect, or a brown tone which conveys the predominating colour of a rich autumnal scene. So good is the colour, so pure the lights, so delicate the detail, and so fine the grain of these plates, that the image appears to be but a stain in the glass itself.

Lantern plates of larger size can be used as transparencies for window decoration, and very light transparencies, but which must be full of detail, make nice pictures of the opaline class if backed up with plain white or tinted paper.

Charming decorative window transparencies can be made from half-plate negatives on whole-plate Alpha lantern plates, the picture being in a tone suited to the subject, with a border of another tone in a contrasting colour. For instance, the centre picture may be a moonlight effect in blue, with a border of orange, showing a space of ground glass between.

This is obtained by printing a picture about half-plate size on a whole-plate, a mask being used to produce a broad transparent border round the picture. On another whole-plate a border with a transparent centre is then made by using a disc larger than the picture on the first plate, exposing to light, and developing as though it were a picture. The two plates, toned to suitable colours, placed film to film, backed up with a sheet of the finest ground glass, and put in one of the many varieties of transparency hangers, will give a most effective and unique picture. It is, of course, obvious that these transparencies can be made in any size, according to the negatives at one's disposal, and the centre may be vignetted instead of masked, with equally good effect.

To work Alpha plates successfully, it is necessary to adhere closely to the instructions accompanying them.

It is essential to have a practically uniform light for exposing, and exposures should be made at the same distance. An average exposure would be about two minutes at six inches from the light of a No. 5 Bray's burner. By constantly exposing under these uniform conditions, a knowledge of the exposures necessary for negatives of varying density is soon obtained.

The choice of a developer is limited, very few being suitable for Alpha. The formula issued with the plates is undoubtedly the best in which the reducer is a simple hydroquinone one and the accelerator a weak solution of caustic soda. A well-restrained ferrous-oxalate developer, weak in sulphate of iron, is also admirable. Ordinary developers will not do, as most give a greenish colour, which is undesirable, except for certain effects, and with them there is a risk of more or less veil in the lights.

The development should be done in plenty of light. One thickness of the palest canary medium is quite safe; in fact, these plates can be developed without a yellow light in an ordinary room at a considerable distance from an ordinary gas light (not incandescent) if the direct light be shaded from the plates, and care be taken not to expose them unduly to this light until they are fixed.

The most suitable colour to develop to is a rich red. A greenish colour is an indication of under-exposure, and yellow of over-exposure, although these may be suitable for certain subjects.

After development, the plate is quickly rinsed in water and transferred to a weak hypo bath; for, if left in the washing water, the development is liable to continue, and make the picture too deep. After fixing, the plates may be washed and placed to dry where they will be free from dust, and, if necessary, may be toned at any time afterwards, or they can be toned immediately after fixing in the following Alpha toning bath:—

Water.....	10 ounces.
Hypo	$\frac{2}{3}$ "
Ammonium sulphocyanide.....	$\frac{1}{4}$ ounce.
Gold chloride	4 grains.

These should be dissolved in the order given, and made up at least one day before using. This bath can be used over and over again if strengthened from time to time, when the toning becomes too slow, with the following solution :—

Water	5 ounces.
Hypo	2½ "
Ammonium sulphocyanide.....	¼ ounce.
Gold chloride	8 grains.

This also should be made up some time before using. A toning bath which has been used repeatedly gives finer tones, and will keep indefinitely if not contaminated by foreign chemicals.

The fixed plate will be yellow in colour, and will dry red, but, in the toning bath, it will pass through the various warm tones to purple and purple-black, and, after very prolonged toning, to blue; but this latter tone is more readily obtained by washing the fixed plate thoroughly, and toning in the following bath :—

Water	5 ounces.
Ammonium sulphocyanide	20 grains.
Gold chloride	2 "

The images of these plates dry considerably deeper and all tones colder than they appear while wet, especially in the warmer range. For the colder tones it is necessary to develop the pictures a little more deeply than when warmer tones are desired.

A. J. A.

THE NEW FOLDING FRENA.

Manufactured and sold by R. & J. Beck, 68, Cornhill, E.C.

The new Folding Frena Cameras, Nos. 7 & 8, which Messrs. Beck have recently introduced, are on the same model as the No. 6 Frena, which was also placed upon the market this year; but, whereas that camera is fitted with a fixed-focus lens, the new models are fitted with focussing arrangements and other adjustments. Either Frena films or glass plates can be used with these cameras, but the No. 8 Folding Frena is so arranged that its special adjustments need not be used unless preferred.

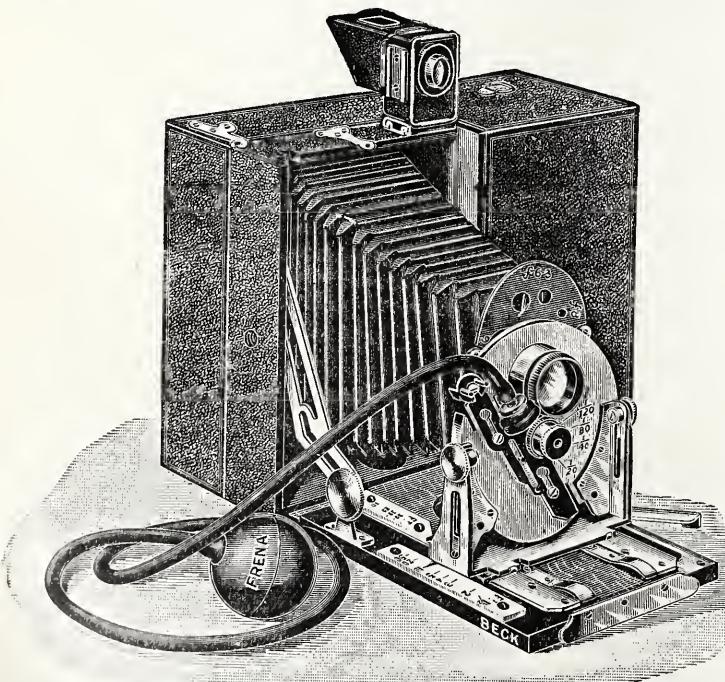


FIG. 1.—The No. 7 & 8 Folding Frena (open).

The Film-holder contains a sliding box, holding any number of Frena films from one to forty under spring pressure, the front one always being in the focus of the lens. To change the film, this sliding box is partially withdrawn while the camera is held with its lens end pointing downwards. By turning the handle the foremost film is automatically dropped into the receiving chamber, where the exposed films are deposited in a pack one by one, in the order in which they have been taken. By means of a new arrangement of the film-holder, the Folding Frena is constructed so that the lens, shutter, and camera can be detached from the magazine and film-changing portion. With the addition of a ground-glass attachment and double plate-holder, it can be used as an ordinary plate camera.

For focussing the camera a lever adjustment is provided and a scale of feet for setting the lens, which is especially adjusted in each camera so that entire reliance may be placed on its accuracy. Besides this an arrangement has been attached, so that the camera may be focussed by

the direct method, even while the film holder is attached to the camera. If the slide of the film-changing portion be drawn out as shown in fig. 4, a focussing glass, B, which is supplied with each camera, may be inserted in a spring trap-door, A. This focussing glass has a ground glass at one end, which, when inserted, is in the exact position that the film usually occupies, and by looking through the magnifying lens at the other end the centre of the picture may be focussed direct.

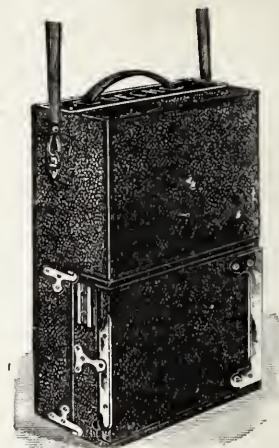


FIG. 2.—The No. 8 Folding Frena (closed).

A swing back is provided. The side links which support the tail-board are so made that the tail-board snaps under ordinary circumstances into the horizontal position, but for use of the swing back it may be clamped by means of two milled heads at any angle required. Fig. 3 shows the camera with swing back and rising front in use. The finder, which is shown in figs. 1, 3, and 4, is a brilliant finder made on the principle of the Cornex finder, which, whilst giving a brilliant picture, shows at the same time a perfectly stationary image. It packs away into the



FIG. 3.—No. 7 & 8 Folding Frena, showing Camera as used for Glass Plates. Swing Back and Rising Front are shown in use.

camera when not in use, but, when attached to it, can be used for either horizontal or vertical pictures by merely revolving the back portion without shifting its position on the camera. The No. 8 Folding Frena carries one of the new Beck-Steinheil orthostigmat lenses, with an aperture of f-6·3, at which the margins of the plate are as sharp as the centre, and the rising front can be used to its full extent, namely, one inch. The front half of the lens may be removed, and the back half

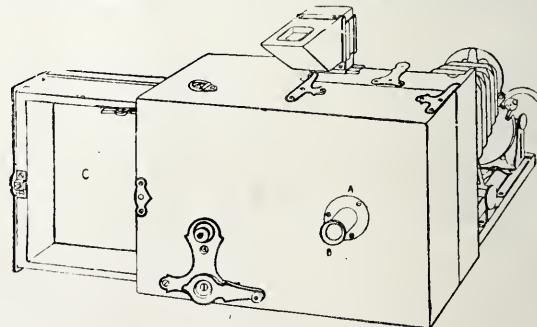


FIG. 4.

used alone as a lens of double the focus and one quarter the speed. For use with this back lens only, the tailboard of the camera can be pulled out, thus making a double extension.

The No. 7 Folding Frena is in every way similar to the No. 8, except that it is provided with a Beck autograph rapid rectilinear lens with an aperture of f-8, in place of the Beck-Steinheil orthostigmat. This lens, when the rising front is not used, covers the plate well.

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THE LANTERN RECORD.

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LANTERN MEMS.

It is curious how men that can sketch belittle photography. Recently one of these said to me, when talking of photography and hand cameras, "I have seen hundreds of photographs, but few pictures," and many times it had been his experience to see enthusiastic and other amateurs snapping away at something that was anything but artistic in composition, when close at hand there was really a picture to take. It seems to me from this conversation that a number of artists with pen and pencil do not avail themselves of the annual photographic exhibitions to become acquainted with what our best workers can do in the way of photographic picture-making. I think a walk round the New Gallery at the present season would be a revelation to them.

* * * * *

THEN again with lantern slides, I have seen some lovely photographs projected on the screen, real art with a big A, and on one occasion had with me a friend who became quite enthusiastic over the beauty of the scenes depicted. There is no doubt the lantern is a splendid aid to art instruction, and the friendly criticisms of members on lantern nights at provincial and other photographic societies has had a most beneficial effect on the composition and technique of lantern slides, and from my experience with buyers of transparencies I can safely say that considerable advance has taken place during the past ten years in the judgment and discrimination of lanternists, for a photograph that is not artistic has very little chance of sale unless it portrays something that is necessary to complete a lecture or affords a useful contrast to a gem in composition and lighting.

* * * * *

ONE of your correspondents recently wrote respecting the absence of figures in the slides representing the Paris Exhibition, but after all, unless as extras, they can hardly be included in a commercial set without it is very much extended; and then it is not commercial, for a set that goes beyond sixty slides is difficult to dispose of or even hire. No doubt there are many most interesting studies of characters at places like the World's Fair in Paris, but the difficulty of getting them is greater than can be imagined by those who have not tried to obtain them without giving offence to the subject.

* * * * *

IF we can go up to the subjects raise our hat and say, "Will you accept two guineas?" no doubt the subjects would be delighted and pose conveniently to our hearts' content and throw in a "smile" into

the bargain, but without some little solatium the photographer will have but a poor chance. One of the slides in the French set of the Paris Exhibition is labelled "Arabs at the P. E.," or something of the sort, but it would be certainly more correct to have added "back view," for the three men show only the backs of their heads and bodies. Then, again, let photographers try to take a near view of characteristic market women and men on the Continent, and see, if they get off in safety with their cameras, what expletives follow them from the individual snapped.

* * * * *

ONE or two men I know have a happy knack of getting good records of characters; but, then, they have amiability and good nature written large on their faces, and a graceful smile and request is rewarded by a sitting after the promise (always kept) of a copy for the subject. Amateurs generally are learning the wisdom of the saw, "if you value your friends' friendship, do not take your friend's photograph;" that is better left to the professional photographer in the studio. Many early efforts of budding amateurs have provoked laughter, but more have brought tears or an early destruction of the print. Thus it is that scenes are more sought after than figures.

* * * * *

I HEARD a good joke about an enthusiastic marine photographer this season at Margate. He was anxious to get some snap-shot of sea nymphs while bathing, and selected a quartette of charming girls in stockinette swimming costumes, who were diving from a boat. They were full of the innocent fun, and after they had been surreptitiously snapped by the Kodaker they plotted among themselves for the downfall of the intruder. So with pretty smiles they invited him to the boat, and they being irresistible he went, but soon found to his cost that it was not so agreeable as he expected, for they rocked the boat until it capsized, and the whole party tumbled into the water. The nymphs were in their element, but poor Mr. Photographer, who was fully clothed, was in a sorry plight, and the ladies had the satisfaction of thinking that his negative was spoilt.

* * * * *

So many lanternists still feel shy of the electric light, and cannot realise that in the arc form it is the most suitable illuminant for the optical lantern, and the simplest and safest of all to use. Everybody who has the electric current available can get the most beautiful and successful results, with the minimum of trouble, and any quantity of light from 500 candle-power to 5000 can be obtained by utilising little or much of the current, and those who have private installations of only 50 or 60 volts can get excellent results. I recently saw a report from abroad of good work done on a 50-volt circuit, and excellent results obtained on a 60-volt one.

* * * * *

THE electric light companies are now supplying for the sake of more economical distribution the currents at 220 volts; but, as this in working only requires a greater resistance of wire, it is just as satisfactory, if not more so, than the 100-volt current, and, although the initial cost is a little greater, the expense of working is practically nil, for the

carbons are very cheap, and also good, it may be remarked now, while the current used in a two hours exhibition would be covered by the amount of sixpence for the electricity used. Those societies and private houses that can get the current laid on should lose no time in doing so, if they wish to know what a luxury the working of an optical lantern is with the electric arc light as the luminant.

G. R. BAKER.

THE LONDON COUNTY COUNCIL'S NEW REGULATIONS RESPECTING THE USE OF CINEMATOGRAPH LAN- TERNS, &c., IN PREMISES LICENSED BY THE COUNCIL.

[Approved by the Council, October 16, 1900.]

1. No cinematograph, or other similar apparatus involving the use of a lengthy combustible film, shall be exhibited on premises licensed by the Council, until the Council has been satisfied that all reasonable precautions have been taken against accident and danger to the public.

2. Notice of any intended exhibition shall be given to the clerk of the Council by the licensee of the premises in which such exhibition is to be given, and the licensee shall be held entirely responsible for the proper and safe use of the apparatus. Such notice shall be given at least three days before the first day of exhibition. Opportunity shall also be afforded to the Council's inspector of inspecting the apparatus before the public exhibition takes place, in order to allow time for any necessary alterations to be carried out and approved by the Council. No gangway or exit must be in any way affected.

3. The cinematograph shall stand in a suitable fireproof room or closed sheet iron box of sufficient dimensions to allow the operators to work freely and fitting closely to the floor, which shall be covered with fire-resisting material within such room or box. The door or doors shall open outwards and be self-closing, and, of the three windows which are necessary in the front face of the enclosure, the centre one shall not exceed eight inches square, and the windows on each side shall not exceed six inches square; a flap screen, to cover all these three holes, shall be fitted and actuated both from the inside and from the outside of the enclosure; the space separating the audience and seats from the iron enclosure shall not be less than two feet in width at the sides and in the front of the enclosure, and the space at the back in which the door is situated shall not be less than six feet from the enclosure. The audience shall be completely excluded from the above space around the enclosure by a suitable barrier. No unnecessary combustible material shall be within the enclosure, and, as far as possible, all necessary combustible material shall be rendered fireproof, or shall be enclosed in fireproof receptacles. The part of the film immediately opposite the lens shall be provided with an apparatus which prevents the film, if kindled, from burning towards either of the spools.

4. The body of the lantern shall be constructed of wood or other non-conducting material, and shall be coated inside with asbestos; it shall also have an inner lining of sheet iron, and an air space shall be left between the iron and the asbestos lining. In the bottom of the lantern shall stand an iron tray, which shall be surrounded by a vertical edge at least one inch in depth. The lantern shall be provided with a metal shutter, which shall fall freely between the source of light and the condenser. This shutter shall be immediately dropped in the event of any accident to the apparatus or stoppage of the film, and shall only be raised when the film is in motion for the purpose of projection.

5. Where possible the electric arc light shall be adopted as an illuminant, the usual rules for securing safety in an electric installation being observed. Ether and other inflammable liquids shall not be employed under any circumstances for producing light. If limelight be used in the lantern, the general regulations for its safety, which are issued by the Council, shall be complied with, and any additional precautions which the Council may deem necessary for securing safety shall also be adopted. The use of acetylene gas will not be permitted.

6. The space in which the cinematograph stands shall, where possible, be illuminated by electric glow lamps; but a miner's safety

lamp may be substituted, if necessary. No naked gas or oil flames, or matches, shall be allowed in the space. The lighting of the hydrogen flame in the lantern shall be accomplished by means of an electric lighter.

7. The films, when not actually passing through the lantern, shall be kept enclosed in metal cases. The film which is passing through the lantern shall be rewound, either automatically or by hand, upon another bobbin as fast as it emerges from the lantern front.

8. Not less than than two, nor more than three, operators shall be engaged within the lantern space, and no other persons shall be within the lantern enclosure during the exhibition. The whole duty of one of the operators shall consist in taking charge of the film after it has passed through the lantern.

9. The licensee shall be held responsible for the employment of competent, experienced and trustworthy operators, and shall be prepared at any time to supply to the Council satisfactory credentials in this respect.

10. Smoking within the lantern space shall be absolutely forbidden at all times.

11. The Council reserves to itself the right of modifying any of the above regulations and of requiring the adoption of any further precautions, in addition to those specified above, as circumstances may require.

ALBUMEN LANTERN SLIDES.

THE lantern season is now with us, and the negatives taken during the past summer furnish ample employment for the winter evenings for making lantern slides therefrom. The method usually practised by amateurs is gelatine dry plates, either with contact or camera exposure. Many of the commercial slides, however, are still made by the wet-collodion process, and some by the albumen process, and there is no question that the latter is, far and away, better for the purpose than the former. But it is more troublesome to work, and consequently the slides cannot be produced so cheaply by the one process as the other. Amateurs vie with each other in the perfection of their slides, but their efforts are confined almost, if not entirely, to the employment of commercial gelatine plates, for few now make a feature of the collodio-bromide method. At the present time the gelatine lantern plates now on the market yield slides of great excellence, and it is only by actual comparison side by side that the superiority of albumen is noticeable. But, then, it is noticeable.

At one of the Society meetings the manufacturer of one of the best lantern plates on the market remarked that his object had been to imitate the perfection of albumen as closely as possible; a remark that seemed to admit the superiority of that process for the purpose of lantern-slide making. We have just said that the albumen is a troublesome process to work; so it is, but it is by no means a difficult one, and, up to the sensitising, all the work can be done in broad daylight. The light in the dark room, when that is needed, be only an orange light, and plenty of it may be admitted, so that it is a comfortable process in working. Albumen plates are slow—not more rapid than the slow gelatine lantern ones, hence their manipulation is very convenient. But for the trouble of the preparation of the plates, we believe that this beautiful process would be largely employed by amateurs whose aim is the production of slides with the acme of perfection. Most have seen the very beautiful albumen stereoscopic slides made by Ferrier in the fifties, and they have not been surpassed if equalled by any modern productions, and that is why we again bring this process to the notice of our readers. The formula for its working is given in the ALMANAC for the current year.

LIMELIGHT MATTERS.—LANTERN ACCESSORIES.

NOTWITHSTANDING that the great bulk of optical lanterns now offered to the public may be said to contain all the requirements necessary for projecting lantern slides within certain limits in a fairly satisfactory manner, there is no doubt that, once an operator enters into lantern work in a really ardent manner, he will not be long in finding out that here and there in even high-class instruments improvements can be

effected by carrying out some slight alteration, or by the addition of some simple little matter to the construction of the shell or other portions of the apparatus. Ask any of our leading lanternists their opinion on this matter, and not one in ten will reply otherwise than that their lantern outfit has been altered from time to time, until it is quite a different thing from its original form, and that innumerable little accessories have had to be added from time to time ere the same could be made to yield the satisfaction which they eventually derive when working in varying situations, some of which are at times very exacting.

One of the first matters that strikes an ardent lanternist, once he has entered into the spirit of limelight projection, is that of ventilation, and the best means of keeping his lantern from overheating. For many years, strange as it may seem, manufacturers in this country, at least, never seemed to grasp the importance of so making the bodies of their optical lanterns that the great heat always generated should have the best means of escaping from the shell. Wooden bodies lined with thin metal, having a ridiculously small air space between, were almost universally employed, and, in fact, are in many instances at the present time still made, the wooden exterior to a great extent preventing much of the heated air from escaping, and actually, as it were, bottling up the heat inside the lantern. The idea of these wooden bodies was, no doubt, to confer more or less comfort in the working of the lamp, for the great heat generated was sufficient to yield an eye-opener, in the event of the hand coming in contact with the unlined portion of a shell. Improvements in ventilation were for a long time little thought of, the main object being to make a lamp light-tight, or as nearly so as possible.

Shells were in former years (*i.e.*, before Russian iron came into general use) made with a larger air capacity, but from about the time of the introduction of the Sciopticon form of lantern the size of the shells was gradually reduced, until a few years ago the same in some instances were far too small for really practical use. To a certain extent a reaction has again, within the past few years, set in; but speaking generally the size of the shells, as found on the market at the present day, is still too small, and with such limited air capacity it is extremely difficult to employ powerful jets without overheating, and the consequent liability to fracture the condensers.

Take, for instance, the case of a metal body having an inner plain and an outer perforated lining. A very common form of such lamp will be found to be in size, so far as the interior of the shell is concerned, about 7 inches long by 5 inches in breadth, and 9½ inches high; and when such shells are made to do duty with a limelight jet, without some alteration in the way of providing extra air passages, for improved ventilation, it is almost certain that trouble will arise, in the shape of overheating and cracking a condenser. As a rule, the main influx of cold air is provided for at the rear of the shell—about the worst possible part of the lamp, for it tends to drive the heat up against the rear of the condenser. In using lanterns of this description, one of the first things an ardent lanternist will set about doing will very probably be the cutting out of apertures in the bottom of the shell, especially underneath the part occupied by the mixing chamber of the jet. This will at once effect a marked improvement, for it will provide for a steady flow of cold air being admitted just at the point where it is most required, so as to assist in carrying off in an upward direction the heat in and around the lime pin, and will at the same time tend to keep the condenser cool.

The cutting out of these apertures in the bottom of a lamp need not affect the light emission, which in many instances is far too much thought of.

No lanternist cares to work with a lantern which is so leaky as to cause unpleasantness to anyone sitting in close proximity to the same; but a little light from such air passages need annoy no one.

To obtain the full benefit of this simple means of improving the ventilation of a lantern a further accessory ought to be provided, in the shape of a couple of stools or blocks, upon which the base of the lantern ought to rest. These stools are conveniently made of blocks of wood, and will serve the double purpose of not only assisting a free passage of air right underneath the bottom of the lantern, but will act as a tilting board as well. In making these little stools, they ought to be of different sizes, and should be provided with little holes, to admit of the studs in the bottom of the lantern resting on them. This will be found to help wonderfully in keeping the lantern rigid. A very useful size to make these stools is as follows:—When the distance between the front and the back stool is, say, 12 inches, the front stool should be 2 inches in height and the rear one 1 inch high. By keeping to these proportions a lanternist can calculate to a nicety the amount

of tilt he will have on his lamp, the one in twelve, as in this case, yielding 1 foot in every 12 feet of distance, and such accessories as these ought to be found in every lanternist's kit; they do away with the need of tilting boards in a great measure, and permit of a nice free passage of air underneath the lantern, just where it is most needed.

Of the innumerable little articles that may be termed accessories to a lantern outfit, perhaps none are more useful than a few little wedges of wood. How often in lantern projection do we see novices failing to register properly their pictures on the screen? To a large extent this is caused by the carrier shifting in the lantern front. Such is easily prevented by seeing before beginning that the carrier is firmly wedged up, so that it is practically immovable in the front. A little wooden wedge will also at times be found useful to fix a lime tray securely when the guides are working too loosely. By fixing one on each side of the tray, after the jet has been finally centred, the same is held securely, and there need be no fear of the centre of light altering during the manipulation of the lantern, or the strip caused by the rubber tubing on the rear of the jet. As a rule, lime trays are better for having a little play in their guides; but this does not imply that they should be so slack, after the jet has been centred, as to make the same liable to get them out of register. A few wedges as accessories will be found very useful.

Such simple little things as nails and rings ought to be found in every lantern outfit. Yet how often do we hear an operator shouting for a few nails or something to tighten up his screen with. When this is en evidence it does not betoken ardent lanternism. A well organised outfit should embrace everything that can be reasonably required, without troubling strangers in the least degree. When this is provided, it confers an amount of comfort in lantern work that can only be appreciated by those who know by experience how rapidly and easily everything can be rigged up for a lantern display when they possess everything they require themselves.

In ardent lanternism, perhaps nothing tends to show an operator's ingenuity more than the manner in which he has provided for the packing of his outfit. And here again, like in many other things connected with lantern work, hardly two workers will be found to be alike. The packing of a lantern, and its accessories, is a science in itself, and often displays an amount of cleverness that is really genius. It is wonderful what can be done by altering the form of a lantern, and substituting some simple little contrivance instead.

Take, for instance, an ordinary single lantern outfit of the Sciopticon form, convertible for limelight working when desired. One of the most serviceable lantern outfits the writer ever witnessed was composed of one of these cheap, but excellent forms of lantern; but it was so altered as to be practically quite a different article when made to suit the taste of its owner. First of all, the telescopic front that usually runs in grooves to carry the objective was entirely removed, and dispensed with, and in lieu of the same a strong board of mahogany, 10½ inches long by 4½ inches wide by ½ inch thick, was substituted for the same. This mahogany board was bevelled at the sides so that it ran in the guides of the front of the lantern body. At the front end of the mahogany board two holes were bored out, that permitted of two small bolts and nuts being used to hold an upright, which carried the objective, just like the front of a camera. By means of this simple contrivance, which could be taken to pieces and stowed away, a very bulky portion of a lantern was at once dispensed with, and the entire space between the slide stage and the front of the lantern was at anyone's disposal for the purpose of packing accessories, &c.

The manner in which these alterations permitted the packing being performed was truly astonishing. Inside the lantern there was stowed the mahogany board, the patent carrier that was always used, the rubber tubing: then on the top the condenser, wrapped in chamois leather: then the lime tray, containing cylinder key and innumerable other little accessories, such as wedges, &c.: the lantern top, and front stool of the lantern; not a single inch of space being wasted. This left the front space, which was nearly as large as that of the inside of the lantern, for other adjuncts, and all this was provided for by using a mahogany board instead of the usual telescopic front of the lantern. The whole packing into a box 16 inches long, 10 inches high, and 6 inches deep.

On the other hand, it must be admitted some lanternists are never satisfied unless they carry about with them quite a number of accessories that are of no practical use. These not only take up room, but are liable to get loose in packing, and do damage to other portions of an outfit.

In packing a lantern outfit, especially when time is limited—as is too often the case at the close of an entertainment—the temptation is very great to throw things, as it were, into their places, and then assuredly will come the truth of the old saying, “The more hurry the less speed.” One fruitful source of mess to a lantern outfit is that of trying by false economy to make limes do duty more than once. Nearly all the dirt and discomfort to the packing of a lantern outfit will be found to arise from the limes not being properly removed from the rest of the outfit. This is a point that clean operators are very particular about. Used limes should always be thrown out, and not a particle of their dust left to contaminate the rest of the outfit.

To enumerate all the odds and ends which come under the category of lantern accessories would indeed be difficult. There is, however, one item which ought to be carefully looked after, and that is provision for protecting the lenses and jets during transit. The former ought to be securely packed in leather jackets, or boxes which are now made especially for the condensers; and these probably are best carried in a separate handbag by the operator or lecturer himself. A few clean dusters for wiping the slides, and last, but not least, a clean towel for the operator's own face and hands, will be found a comfort on many occasions.

T. N. ARMSTRONG.

LANTERN NOTES AND NEWS.

“France and the Principality of Monaco” is the title of a new set of lantern slides which Messrs. G. W. Wilson & Co., Ltd., of Aberdeen, are just issuing. The set includes views of Paris, and incorporates former sets on France. It numbers 481 slides.

* * * * *

Last week a conference of the Society for the Protection of Birds, at 3, Hanover-square, was followed by an “At Home” at the residence of its vice-president, Lady Theodora Guest, 26, George-street. Lantern lectures have long been an important factor in the furtherance of the cause; but now a new set of slides are to be added to the already fine collection, in order to illustrate approved “bird” songs, so as to constitute an entire programme for an evening's entertainment. The experiment was inaugurated effectively through the kindness of Madame Antoinette Stirling, who sang “The Quail” and “The Sparrow's Ditty.”

* * * * *

At the last meeting of the West Surrey Photographic Society there was a demonstration by Mr. Sheed of lantern slide making, on Thomas's plates. The demonstration showed the great possible range of tones obtainable by the maker's formula, and Mr. Sheed found himself, he said, able to rely upon getting the particular tones he wanted with much more certainty than on many other brands of plate he had tried. He showed the possibility of getting from black to warm brown tones, and to nearly red ones, by altering the developer, as directed, and as experience suggested, and said his preference for the Thomas plate was the result of many trials, with the resulting ups and downs to be expected, assigning the ups to Thomas's plates principally. Matters of business also came before the Council, which does not meet again till January.

* * * * *

On Monday night, at the Royal Photographic Society's Exhibition, at the New Gallery, Mr. Samuel J. Beckett showed upon the lantern screen a series of typical portions of the C.I.V. procession, numbering some seventeen pictures. Mr. Beckett informs us that the slides referred to were all taken and finished between 3 and 8.30 p.m., at which time they arrived at the Gallery. The negatives and also the slides were both dried off by heat, after treatment with formalin. They were accorded a very hearty reception indeed.

* * * * *

It is the opinion of the “New Zealand Photographer,” and we quote it in virtue that some interest may attach to it, as the utterance of a distant onlooker, that the kinematograph, as a popular amusement, is about “played out.” At first (proceeds our contemporary) the novelty was an irresistible attraction, but the average sightseer soon tires of paying for the exhibition of scenes similar to those which he can see any day for nothing. There are some sights and scenes which will always attract and interest an audience—perhaps a prize-fight has proved the biggest draw of any—and this does not say much in favour of the intellectual qualifications of the average patrons of the show. A real Maori war dance, if it could be revived, would be a sure thing. The Haka or Poi dance would be very good subjects; but the Fijian

Meki would make one of the most animated scenes if it could be well represented. So the “kine on the battle-field” has not proved the success which was expected of it. You, see, the stirring events always happened at such unexpected times. There was no reliable programme for the man with the machine to follow, and he always happened to be “in” just a minute too late. Why, the best pictures of all were specially enacted before the camera. Some folks would call them “put-up jobs,” but once, the papers tell us, a camera really did go off and hit somebody. That was a realistic episode for which the models did not bargain. The next sensation promised is a film representing the decapitation of a hundred Chinamen. Those little things show the horrors of only a few executions will be as nothing to this. Just think of the thrill of emotion to be aroused, and the elevating tendencies of the exhibition, when you can see the Lord High Executioner cut off a hundred heads in turn.

PHOTOGRAPHY AND THE PRESS.

I.

So much money is now spent upon photographs for reproduction in the illustrated newspapers and magazines that some practical advice to those photographers who would be glad to pick up some of the shekels which editors are flinging around will probably be welcomed by most of those who depend upon the camera for a livelihood. As far as the daily journals are concerned, such as the “Mail” and similarly roughly and rapidly printed sheets, reliance is necessarily placed on line drawings. These are, however, usually based upon photographs, which are submitted by photographers from all parts of the kingdom and most parts of the world.

The methods followed differ. Occasionally a photographic print is outlined with waterproof ink, the silver (or iron) image being subsequently removed, leaving a line drawing ready for the zincographer to turn into a block. But in most cases the photograph is simply copied with pen and ink by one of a staff of specially trained black-and-white draftsmen retained for the purpose. Some establishments have arrangements whereby an enlarged positive image is projected upon a screen, from which the artist makes his drawing. By this procedure a quarter-plate negative will indicate a surprising number of facts upon which draftsmen can work.

RAPIDLY OBTAINED RESULTS.

As regards the general body of photographers, most interest will be centred in the methods used to quickly obtain negatives and prints which shall, in as short a time as possible, be ready for dispatch to the editor of an illustrated newspaper.

The writer, who has had many years' experience with editors of illustrated journals, specially urges upon all concerned to adopt every possible expedient for ensuring early delivery of a print. Although, as a rule, all prints are given out to the block-maker not less than two days before date of publication of a weekly newspaper, the majority of the illustrations are put in hand a good deal earlier; and although some editors will often take an important or an unusually striking print of a passing event even after the forty-eight hours' limit, they are somewhat shy of throwing out a block already finished, or an order for a print which comes to hand at the last moment. Hence half an hour may make all the difference between securing a fee from an editor and being too late. Thus a photograph taken during the afternoon in the provinces may just miss the evening mail to London should the photographer not be up to every possible dodge for working against time.

There are two procedures which, under ordinary circumstances taking a long while, may be very much shortened.

1. Making and drying the negative.
2. Making and drying the print.

As regards the first point most photographers are, or should be, aware that the development of a negative need not, under favourable conditions, take more than about four minutes in the reducer, the fixing, or clearing, may need five. The washing need not take more than one minute. Immersion in two baths of spirits of wine will permit of the film being dried in five or six minutes; that is to say, a glass negative, quite dry, can be obtained inside twenty minutes.

In our days, however, an increasingly large proportion of photographers, more particularly those who are more or less connected with the press, employ rollable and other celluloid films for obtaining the negatives. They may not be dried by means of immersion in alcohol, as it would attack the celluloid support. It is true that some makes of rollable film, such as the Cristoid film, which contains no celluloid, may be treated with alcoholic solutions, but at present nearly every one uses celluloid. As regards these films, they may be formalined, blotted, and the drying then accelerated by employing gentle warmth; but, if this be done, there is always some considerable danger of the film, sooner or later, peeling off from its support. A better course is to take them direct from the washing tank, let them be carefull, blotted and backed up by a sheet of glass, and placed in an enlarging lantern of low actinic energy; with a fairly clean, quick, negative, and enlarging not more than two or three diameters, the time necessary for exposure is not

sufficient for the heat of the illuminant to injure the gelatine surface.

This expedient not only saves time, but what is often of very considerable value, enables one to slightly enlarge the original. Thus a quarter-plate, which in nine out of ten cases is the size which will be used, may with the slightest possible loss of definition be turned into a half, or even whole-plate print.

Of course, those who are working with larger sizes, say half-plate and over, would not find the above expedient of so much service; but the celluloid film is rarely used for sizes exceeding 5 by 4.

MAKING AND DRYING THE PRINT.

For a very long time makers of process blocks impressed upon editors that, in order to get good results, a "silver" print was a sine-qua-non. By "silver," albumenised, gelatino-chloride, or collodio-chloride, paper toned with gold is meant. It is needless to say that this restriction meant the loss of a large amount of time. It is not easy to say why this exclusiveness should have been so long maintained—probably because with the above print-out papers there is usually present a good deal of detail combined with a considerable proportion of half-tone. In a "bromide" paper, although similar qualities may be present, it is quite possible—and, indeed, frequent—that shadows and high lights may both be deficient in details which the block is able to reproduce, although, in some cases, they may be just sufficiently visible to suggest a good deal to the eye of one looking at the photographic print.

But of late the exigencies of press work have compelled even the most conservative of process-makers to accept without a murmur, and handle without a mistake, pretty nearly every form of print which may be sent to him.

Anyhow, for rapid work, many of the leading illustrated papers are obliged to depend upon various makes of bromide paper, which, being printed in a few seconds, may be finished off in a few minutes.

That there may be as much detail, and as little scattering of light as possible, a paper having a glazed surface is generally used. Of these there are several varieties on the market.

WHITE NIKKO.

Take the one made by Kodak Limited known as Nikko. This is usually sent out with a pale, almost invisible, pink tinge, but for process work a white paper is preferable, in which form Nikko is procurable, although it is not stocked by most dealers, but requires to be specially ordered.

Nothing need be said as to the exposure or development of the above, except that the print should aim at possessing plenty of half-tone with bright lights and strong shadows. It is also a gain if the image is brown, or black inclining to brown. To which end many expedients are possible which will suggest themselves to the practised photographer—and none other is likely to undertake this business. Personally, ortol has been found a very satisfactory reducer to use. It is true that sometimes the resulting print is not very charming in its colour, being neither good black nor good brown, but, for all that, it yields a very satisfactory process block.

The formula advised is the following : Using twenty per cent. solutions of soda carbonate and soda sulphite, and a ten per cent. solution of ortol, mixed with half its weight of metabisulphite of potassium, and a ten per cent. solution of potassium bromide in reserve.

Take of each of the first two solutions, 2 ounces ; of ortol solution, 5 drachms ; make up to 12 ounces with water, and, if necessary, add quantity sufficient of potassium bromide, say 5 to 15 drops.

Fix in acid bath, rinse, and place in a solution of formalin. Blot off, and the print may be right away dried before any convenient source of radiant heat, say a fire or otherwise.

HECTOR MACLEAN.

A COMPLEMENTARY STEREOSCOPE.

DURING the process of viewing a landscape with both eyes, voluntary axial and involuntary focal changes take place as the attention is turned to and from various objects composing the landscape.

The general impression of solidity is the result accruing from two distinct impressions—one received on the retina of the right eye, and another received on the retina of the left eye, the nature of these dissimilar retinal pictures being determined first by the direction of the eyes' axes, and secondly by the refracting humours.

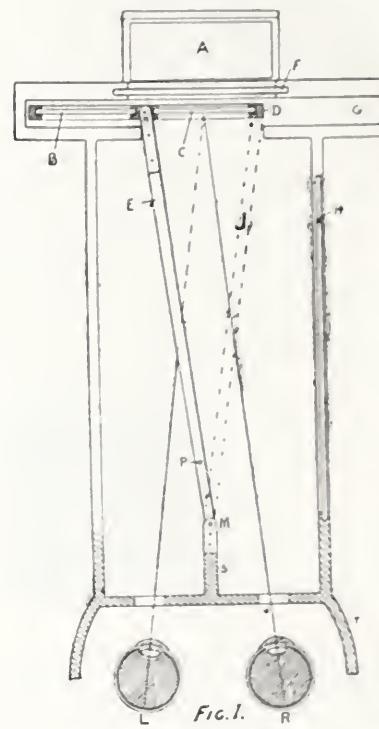
Although the sensation of relief is produced by a combination of the two retinal impressions, such impressions are not simultaneously conveyed to the brain. They are regarded separately—or, rather, at different moments, for exhaustive experiments have shown that the two retinas cannot be equally stimulated by rays emanating from the same source and at the same moment of time. In other words, we might say binocular vision is effected by the alternate exhaustion of the nerve fibres, creating temporal blindness to certain colours or degrees of light.

That the retina of either eye may become fatigued has been often demonstrated. The theory of accidental, or what is perhaps better known as complementary colours—the alternate appearance of positive and negative images—and the temporary blindness that follows when the eyes have been exposed to excessive light, all substantiate the accepted

view that the activity of the retina is limited to a definite period, and that it is only able to recover sensitiveness after a time of rest.

On this assumption the complementary stereoscope has been constructed, and it has been so designed that either coloured transparencies or plain black and white pictures may be used.

The apparatus, a sectional plan of which is shown in fig. 1, consists



of a box form stereoscope, without lenses. A ground glass window is fitted at *H* and *F*. The holder, *B*, in which the complementary pictures are to be placed, is attached by the pivot, *H*, to the partition, *E*, which partition is capable of turning on the hinge at *I*.

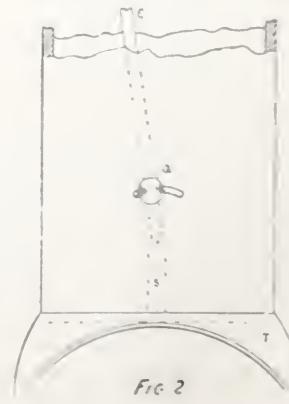
A reflector is formed by the mirror, *A*, hinged to the end of the apparatus, and set at an angle of 45 degrees. The movement of the swinging partition, *E*, is controlled by a knob, *Q*, shown in fig. 2, its play being limited by the slot. The dotted lines in fig. 2 indicate the position of the partition as it is turned towards the left-hand side of the apparatus.

It should be observed that the pair of pictures to be employed must not only be positives and negatives or printed in complementary colours, but also they must be stereoscopically taken.

The method of using the instrument will perhaps be best explained by referring to fig. 3, a negative and positive stereoscopic pair of pictures.

The eyes of the observer being placed at *L* and *R* (fig. 1), the left eye, positive, *B*, is placed in the holder, *D*, at *N*, and the right eye picture, which is a negative, like *C* (fig. 3), is placed in the holder at *C* (fig. 1).

The partition, *E*, being moved to the left side of the instrument, as shown in the diagram, the stereoscope is held so that a strong light



may fall upon the mirror, *A*, reflecting the light to the window, *R*, by which it is diffused over the negative, *C*. The retina of the right eye, *R*, is thereby strongly stimulated with rays of light sifted through *A*.

negative. At the same time the left eye is prevented from seeing anything by being shut off to the dark chamber made by the partition, E.

When the right eye has been looking at the negative for about thirty seconds, the partition, E, is suddenly shifted from the left to the right by means of the knob. The positive, B, is now presented to the left eye, but it is seen not as might have been expected, a plain picture, but it possesses stereoscopic relief.

This surprising effect is due to the fact that the right eye, after being stimulated with rays emanating from the negative, C, becomes temporarily blind to such rays, and is sensible only to rays of a complementary character. Thus whilst the left eye sees a left-hand positive, the right eye sees also a positive image, dissimilar to its companion view. Moreover, both being observed at the same point, they naturally coalesce. Thus, by the combination of a real and an accidental image, the observer becomes conscious of a stereoscopic relief, similar to that produced in an ordinary stereoscope.

Although the effect obtained in such a constructed instrument may only be retained for a short time, the mode of securing the effect is at least novel, and therefore worthy of note.

Although it is, perhaps, somewhat apart from our present subject, it is particularly interesting to note that when the dissimilar pictures, B and C (fig. 3), are examined in an ordinary stereoscope, the background

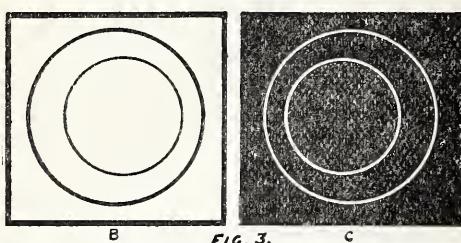


FIG. 3.

of the combined image presents a semi-transparent appearance, and looks very much like a piece of ground glass. It is difficult to say with any degree of certainty at what stage of the observation such a sensation is produced, and the manner in which the mind appreciates this intermediate tone must also remain a mystery.

We note, however, this semi-transparent impression cannot be retained by the observer for any considerable period; after a few moments' observation either white circles upon a black ground will be seen or the reverse. Such an alternate appearance of positive and negative images is due to the successive fatigue of the retina in each eye. If, for instance, still using the ordinary stereoscope, we close the left eye, the retina of the right eye will be stimulated with rays emanating from the picture, C. On suddenly opening the left eye again (which has been resting from light altogether, and thereby increasing its sensibility), we shall see, not, as might be expected, the semi-transparent image, but black circles upon a white ground. The same holds good, but in a reverse order, if we rest the right eye in the first instance, and afterwards use both.

The foregoing experiment is most successfully carried out by having both negative and positive images equally illuminated with reflected light, and the semi-transparent image is best seen if, after adjusting the focus, both eyes are closed for a few moments previous to the binocular observation.

THEODORE BROWN.

ROYALTY AND THE CINEMATOGRAPH.

LAST week the Earl and Countess of Clanwilliam entertained a company of about four hundred at Abergeldie Castle, a cinematograph exhibition, given by Messrs. Walker & Co., Aberdeen, being followed by supper served in a spacious marquee erected in the grounds of the Castle. Her Majesty, who had warmly interested herself in the entertainment, had graciously indicated her desire that as many of the servants as could possibly be relieved from duty at Balmoral should accept the invitation of Lord and Lady Clanwilliam. Many of the materials for the lavish decoration of the marquee and of the hall in which the cinematograph display was given had been sent from Balmoral, and the servants of Lord Clanwilliam received the assistance of Mr. John Reid, the Queen's upholsterer, and his assistant, Mr. W. Macdougall; Mr. Troup, the head gardener at Balmoral, and Mr. Anderson, clerk of works at Balmoral. To Mr. Reid belonged the artistic arrangement of the draperies by which the coach-house—selected as the scene of the cinematograph exhibition—was transformed, for the nonce, into a spacious drawing-room. A feature of the decorations that attracted much admiration was due to the ingenuity of Mr. Anderson. Under the word "Welcome," in large letters, this gentleman had daintily traced out in vari-coloured leaves the monogram of Lord Clanwilliam, and the effect of the simple device was exceedingly pleasing. For the

decoration of the marquee pot plants, sent from Balmoral, were ranged along the tables, and many flowers were tastefully displayed by Mr. Troup and assistants.

Princess Henry of Battenberg, accompanied by her children, and Princess Victoria of Schleswig-Holstein were included among the guests of Lord and Lady Clanwilliam, but Princess Henry found it necessary to return to Balmoral immediately on the conclusion of the cinematograph exhibition. Prince and Princess Dolgorouki and party came from Braemar Castle; Sir Allan and Lady Mackenzie and party from Brackley; Admiral Sir Edmund Commerrell and party, including Colonel Caldwell, from Abergeldie Mains; Lord Glenesk and party from Glenmuick; Lady Biddulph and party from Birkhall; and Mr. Forbes, Queen's Commissioner, and Mrs. Forbes, from Craig-Gowan. The Royal and other distinguished guests occupied seats at the far end of the hall, from which, as the flooring had a considerable slope, they secured a perfectly unobstructed view of the cinematograms. The series of stirring war pictures, accompanied by a few explanatory words from Mr. William Walker, aroused much enthusiasm, and these were followed by local pictures, which appealed with peculiar force to the gathering at Abergeldie—such, for instance, as the presentation of colours to the 1st Battalion Gordon Highlanders by the Prince of Wales at Brackley, and the view of the Braemar Gathering at Balmoral Castle.

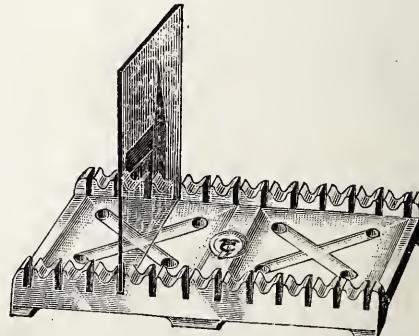
The Duke and Duchess of Fife also entertained their tenantry and retainers to a supper and cinematograph entertainment at Mar Lodge last week. The supper was served in the spacious mess-rooms at the stables, after which the company adjourned to the beautiful ball-room, where the cinematograph entertainment was held. The entertainment was graced by the presence of the Prince of Wales, the Duke and Duchess of Fife, Sir Allan and Lady Mackenzie, Miss Forbes, and Captain Fortescue. Over seventy of the tenantry present were in full Highland costume of Duff tartan. The men lined the pathway from the mansion to the ball-room, each bearing a lighted torch, which gave a grand effect in the inky darkness which prevailed. The distinguished party come down the path to the ball-room preceded by five pipers. Messrs. Walker & Co., Aberdeen, supplied the cinematograph entertainment, which was of the usual high-class order, as testified by the numerous rounds of applause. The performance, which finished shortly after ten o'clock, was highly appreciated by all those present, especially by the older members, many of whom had never seen an entertainment of the kind before.

In a letter to us, Messrs. Walker, whom we congratulate on the evident success of their endeavours to popularise high-class cinematograph entertainments amongst the "fine flower" of the North, remark of the first-mentioned display:—"We cannot remember any audience taking a more lively interest in the varicus items as they flashed along the screen than did the six hundred, which was calculated was the number present. The pictures we have marked are our own taking. Every item was followed by the keenest interest in the war, where we took them from Southampton to Pretoria."

A PORCELAIN DRAINER.

Manufactured by Taylor, Tunnicliff & Co., Eastwood, Hanley. Staffordshire.

THIS neat and beautifully made porcelain drainer, will be found of the greatest service on the dark room bench or in the sink. It holds a dozen plates, as the illustration shows, and in case of need it may be utilised as a washer by standing it in a suitable vessel under a tap.



Two sizes are made, the one holding negatives up to half-plate, the other up to $8\frac{1}{2} \times 6\frac{1}{2}$, at prices of 9d. and 1s. respectively. We have used one of these drainers with the greatest satisfaction. The plates are securely held, and the drainer is so constructed that it has a firm base. It is obviously as useful for lantern slides as for negatives.

EARLY HISTORY OF THE INCANDESCENT GAS MANTLE.

[Abstract of Cantor Lecture delivered before the Society of Arts.]

GREAT as has been the advance in incandescent lighting in England during the past eight years, we are still much behind Continental practice, and whereas in many towns in Germany from 80 to 90 per cent. of the gas burners are of the incandescent type, in London the percentage would hardly reach 20. This is largely due to the ability with which the English Welsbach Company have hedged around their great monopoly, and have kept up the price of burners and mantles; so that, although in Germany you can buy an incandescent burner and mantle for a mark, it costs the English consumer 4s., and the fact that a union jet nipple can be obtained for a penny compensates with a very large class of consumers for the fact that they obtain only one-tenth the amount of light from their gas than the larger outlay would render possible.

All burners owe their light-giving powers to incandescence, and the gas flame which emits light because of the glowing particles of carbon within the envelope of the flame has just as good a claim to the use of the term "incandescence" as the mantles which the term always now conjures up in our minds, the principle of which consists of consuming the coal gas in an atmospheric burner with a non-luminous flame, so as to obtain the maximum amount of heat. They merely replace the carbon particles by finely divided rods or threads of non-combustible oxides, with a greater power of emitting light when heated to a given temperature than the original carbon particles possessed.

Producing light by heating refractory bodies to incandescence is entirely an outcome of the nineteenth century, and dates from 1826, when Drummond first showed that a piece of dense lime could be raised to intense incandescence by the heat of the oxy-hydrogen blowpipe flame, the lime at later dates being replaced by buttons or discs of magnesia and also by zirconia. When using a comparatively large mass of material, as was done in these earlier experiments, the temperature needed to secure incandescence was above that which could be obtained by the use of air as the supporter of combustion, and it was a considerable step forward when it was realised that, by attenuating the body to be heated, and choosing a highly refractory material of low conductivity, an ordinary flame could be made to give the temperature which with the larger mass had required the use of such costly appliances as the oxy-hydrogen blowpipe.

Even before the middle of the nineteenth century the general principles upon which the incandescent mantle of to-day is based were known, for we find that Talbot, in an article on "The Nature of Light," published in the *Philosophical Magazine*, in 1835 (iii. 114), stated that "Paper soaked in a solution of chloride of calcium, and burnt in the flame of a spirit lamp, leaves a white network of ashes, which, when held in the feeblest alcohol flame, emits a brilliant light."

This experiment contains the germ of incandescent gas lighting, and embodies the principles adopted at the present day, namely, the saturation of a natural combustible fibre with the salt of a metal, burning off the organic matter, and leaving a skeleton of the oxide of the salt of the metal used, in so finely divided a condition that, when subjected to the heat of any non-luminous flame, it becomes incandescent.

Four years afterwards Cruickshank took out a patent for a cage or mantle of fine platinum threads woven together, and of such a shape and size as to thoroughly envelop the outer portion of the flame which causes its incandescence. Cruickshank, however, noticed that the luminosity of the wire was not so great as that emitted by heating the oxides of certain metals, and attempted to increase the light emissivity by coating the platinum wire with a paste of such oxides, but without much success, as it was found impossible to make the paste adhere to the surface of the wires for any length of time.

In 1848 Gillard first put the manufacture of water gas on a comparatively successful footing by introducing the principle of raising carbonaceous material to incandescence in a cupola furnace by an air blast and then injecting steam to form the water gas until the temperature fell, when the steam was cut off and the fuel again "blown" up to the necessary temperature to make water gas once more, a process which is the basis of all modern water-gas practice.

Water gas, consisting of nearly equal volumes of hydrogen and carbon monoxide, burns with a non-luminous flame, and, desiring to utilise it for lighting purposes, Gillard devised a cap or mantle of fine platinum wire, which was suspended in the flame and heated to incandescence. For some months this method of lighting was in use at Passey and Narbonne, but the trouble which has wrecked all attempts to utilise mantles of platinum soon showed itself, and the light emitted by the metal filaments rapidly grew less and less under the influence of the burning carbon monoxide, and finally the mantles

became so brittle that they fell to pieces. In 1849 Frankenstein introduced a lamp in which the flame from oil or spirit was caused to heat to incandescence a netted fabric, which was coated with a thin paste of magnesia and lime mixed with gum arabic. Owing, however, to the materials being merely pasted upon the fabric and not soaked into it, these mantles were very fragile and had no durability. Indeed, it is an impossibility to make a mantle exactly according to the instructions given by Frankenstein, who, as was afterwards explained by Werner, really mixed with his ingredients a little common salt, whereby some of the oxides were converted into soluble chlorides. These soaked into the fabric and so rendered the manufacture of the mantle possible.

So far the work done had been to establish the form of the mantle, and the principle of obtaining the material in a sufficiently fine state of division to become highly incandescent at the temperatures given by an ordinary flame, whilst Talbot had clearly indicated the way in which this might be done.

The only non-luminous flames available up to this period were those of the spirit-lamp and water-gas, but, at this epoch, Bunsen, the greatest of Heidelberg's great men, was planning and fitting those laboratories which have since given so rich a harvest to the scientific world; and, while considering the methods of heating which should be adopted on the working benches, his attention was called by one of his assistants—now Sir Henry Roscoe—to the then novel contrivance of a non-luminous gas burner. Seeing at once the enormous convenience of such a source of heat, Bunsen brought his marvellous manipulative skill to bear upon the subject, and in a few weeks gave the world the "Bunsen burner," a burner which has done more for the gas industry than almost any discovery or invention connected with it, which has made coal-gas available for fuel purposes, and has enabled it, in conjunction with the incandescent mantle, to hold its own against the threatened rivalry of the electric light.

The next step of importance in the history of the incandescent mantle was the replacement of lime and magnesia, which up to this time had alone figured as constituents of the attempted mantles, by oxides of a more refractory character, having the property of emitting a more intense light at the available temperatures.

In 1852, Bergemann noticed that oxide of thorium when heated to incandescence emitted a beautiful light, while in 1863 Bahr, when heating nitrate of erbium upon a platinum wire, observed that it swelled up and left a residue of oxide, which emitted a brilliant greenish light. He communicated this result to Bunsen, and they made a joint investigation of the subject, the results of which were published in Liebig's *Annalen* for 1864, where they pointed out that the oxides of the yttrium group of metals, when heated to incandescence, emit a beautiful light of great intensity.

In 1878 Edison patented the idea of coating platinum wires with oxides of such metals as zirconium and circium, the materials being applied as soluble salts, acetates, oxalates, or nitrates, which were then burnt off, giving a more coherent structure than was obtained by Cruickshank; the coated wires were afterwards heated by the passage of an electric current.

PROFESSOR VIVIAN B. LEWES.

PRINTING SKIES IN ENLARGEMENTS.

FEW negatives are produced in landscape work without the aid of special apparatus, such as a Parker sky shade, that behave well under enlarging. In some cases the skies are too thin, in others so dense as to permit of little or no light passing to the sensitive printing material, and as a result it follows that a blocking out or shielding operation has generally to be resorted to, when such negatives are being subjected to enlargement.

To many amateurs the operation of enlarging their small negatives affords much pleasure, especially when it can be performed with the aid of artificial light; but, judging from the class of work generally produced by novices by such means, it would appear that the printing in of suitable sky effects was an operation somewhat beyond the powers of the great majority of such workers, some failing to tackle the operation of blocking out the sky in the original negative, so as to yield a white surface for the printing of the sky negative; others, again, fail to comprehend the modus operandi of printing in cloud or sky effects from different negatives; whilst a further class of workers, possessed of more knowledge and courage, strive after strong effects, and in nine cases out of ten succeed in printing in a sky much too decided, or, as a painter would say, lay the paint on too thick.

The operation of enlarging direct from small-sized negatives may be divided into two distinct classes—viz., those performed with the aid of some enlarging apparatus and artificial light, and secondly when it is executed with the aid of daylight. As to the merits of the two

systems, there is not any doubt in the minds of practical workers as to which is the better means to employ, for in all cases where enlargements have to be produced the one chief factor to be studied is the proper lighting of the negative that is being enlarged, and there is no question about the fact that it is best performed by means of daylight, and some simple attachment to the window of an ordinary room, whereby it can be turned into what results practically as a large camera for the time being, or, as some term it, a dark room.

This lighting of the negative is of paramount importance, and cannot be neglected where high-class results are required. Fortunately, however, only the simplest means are required to make any suitable room, with, say, one window, specially adapted for enlarging purposes. No doubt amateur workers have a strong leaning to overtake this work by means of artificial light, simply by reason of the fact that it enables them to derive much gratification during their leisure time at nights; but daylight is to be preferred without doubt where circumstances permit of its employment.

Whichever method, however, be selected, the operations necessary to print in sky or cloud effects are practically the same in both cases, and consist, first of all, in so preparing the original negative, either by an elaborate amount of careful blocking out, as is often necessary in the case of some views where important details extend beyond the sky line, or by so shielding such parts during exposure of the foreground of the negative as will yield a proper surface for the sky negative. There is such a wide range of subjects in outdoor work that it is impossible to lay down any hard and fast line of instructions which would be applicable to all cases, beyond that of adopting some means whereby the sky portion of the sensitive material must be protected from reduction by means of any light other than that which passes through the negative it is intended to print on such portions.

This (so far as reserving the part required for the sky is concerned) is obtained by means of shielding or blocking out the sky in the original negative, and, of course, a similar treatment is required when dealing with the selected sky negative, for it must be specially prepared to suit the form of the picture projected on the screen, when the original negative has been carefully placed in situ and focussed.

In all operations of this kind it may be taken as a sine-qua-non that both the sky negative and the original negative that is being enlarged must be of the same size. This is necessary by reason of both having not only to fit into the same receptacle behind the lens, but, further, it enables anyone to nicely adjust the form of the sky portion to the shape or contour of the image projected from the original negative.

A simple example will make this clear to anyone undertaking this work for the first time. Take, for instance, an easy case, in which the background verging into the sky line is represented, as is often seen, by a range of mountains having well-defined outlines clear and sharply cut against the sky. To prepare the sky negative for such a subject, let the original negative be placed upon a retouching desk, and by means of a sheet of tissue, or other transparent paper, by means of a lead pencil draw a tracing of the outline of the hills. This is to act as template in producing an opaque mask to cover up the portions of the sky negative that would, if left unprotected, impress its image on the foreground and all over the picture. Having provided this white paper mask, it is laid over a piece of black or other opaque paper, and the latter is cut to exactly the same outline and dimensions in every way as the original negative. It is then carefully attached to the lower portion of the sky negative, and if it has been properly done, when the two negatives are superimposed it will be found that the sky negative exactly coincides with the outline of the mountains. This done, a worker is in a position to proceed to the exposure of both negatives. It is well, however, to impress upon novices in this work that a little care in making preliminary provisions against failure is never labour thrown away, for it must be borne in mind that we are dealing with an operation which in the case of failure, where very large sizes are concerned, means considerable loss in material.

In printing from two negatives it stands to reason that in the system adopted for enlarging there must not only be facilities for readily removing one negative, so as to substitute another in the exact position, but also, as will be necessary where to do this daylight is admitted into the room, there must be provision made to protect the sensitive material from any light that might enter when the negatives are being changed.

Many workers who limit their enlargements to what may be termed small sizes utilise their largest camera and dark slides; but the best system is undoubtedly that which places no limit to the extent of magnification, and at the same time permits an operator to have access

to his sensitive paper, and to be able to see what he is doing all the time.

The latter is a great power in the hands of a practical worker, for he can thereby shield off here and there any portion of either negative that he fancies requires special treatment. When the sensitive paper is contained in an enclosed slide, it is impossible to effect much, if, indeed, anything at all, in this respect.

The question may be asked how, then, can a sheet of paper on an easel be protected from light when changing a negative and daylight is admitted into the room? The answer is: Easily enough, by pinning over its surface a large cover, either of paper or other material. With the writer, who frequently makes enlargements up to six feet in length, such large sizes are regularly shielded when a certain negative is changed.

Success in such operations all lies in the word "preparations." If everything is carefully thought out beforehand, enlarging is by no means difficult; but the moment it is entered upon in a happy-go-lucky manner, that moment failure crops up of a certainty.

Some consideration must be bestowed upon the selection of the negative that is to do duty for producing the sky effect, and in very important cases it is well, after it has been prepared and masked off, as previously described, to pull off a print from both negatives by means of an ordinary printing frame their natural size. By this means it is easy to form an opinion as to the suitability of the sky negative, but an expert enlarger does not take long to get a sky negative to suit his purpose if he has not one beside him that has been photographed from Nature, he very soon will make one by means of a sheet of glass the same size as the negative and a slight modicum of oil-colour smeared upon the glass; and these artificial shields, or sky negatives (or call them what you like), produce most charming results and work softer than actual negatives taken direct from clouds in the sky.

In small sizes (say, up to 12 by 18 inches), a clever worker can often, when the extent of the sky is not great, work in by hand charming effects of atmosphere and clouds by means of a suitable powder pigment, and thereby do away with double printing altogether. To many this may appear an extremely difficult matter to accomplish, but, in point of fact, it is extremely easy when the right materials are employed and are gone about with confidence. At first it is just ten to one a novice will overdo the work—that is, he will make the sky too heavy.

"The great secret of success lies in only rubbing in a soupcon of pigment, and softening off even that."

This can be effectively performed with a very soft piece of wash-leather, and the writer knows of nothing better than a little powdered starch, just discoloured with a trace of black crayon. Only the smallest trace of the latter should be incorporated with the starch, which must be very finely powdered, and applied quite dry, of course. And not only is this an efficient means of dealing with small-sized skies on bromide paper surfaces, but it is also a handy means of softening down a sky that has been printed in from another negative, and which requires some doctoring.

In using the powdered pigment, a novice must be careful to place upon his leather only the merest trace. With such he will be able to get plenty of effect and work the same nicely into any form or shape.

In printing in skies, where blocking out has been performed, and any prominent object, such as a church spire or monument, extends over the sky line, the same need not be specially shielded, for unless the sky negative be much overprinted, the same will not be visible on such dark portions of a picture.

A little thought and close application will soon enable anyone to make their own sky negatives, and to print the same with unerring precision into any form of picture.

A. T. NEWTON.

Correspondence.

THE AURORA LANTERN SLIDE CLUB.

To the Editors.

GENTLEMEN,—Would you kindly allow me, through your columns, to state that there are a few vacancies in the list of members of the Aurora Lantern Slide Club, of which I have been recently appointed Hon. Secretary.

I should be glad to hear from any lady or gentleman willing to join. The subscription is 3s. 6d. a year (October to October). Prizes are awarded by the votes of members to the two best sets of slides in each quarterly circulation.—I am, yours, &c.,

(Rev.) T. PERKINS.

Turnworth, Blandford.

MONTHLY SUPPLEMENT

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[December 7, 1900.

THE LANTERN RECORD.

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LANTERN MEMS.

To obtain a good instantaneous photograph in London during the afternoon of a November day requires not only a good apparatus but technical knowledge and special selection of position. To secure a good cinematograph record of a procession under such circumstances is a professional triumph. I am led to these conclusions after seeing on the screen the results of the animated photographs taken during the triumphant march of the City Imperial Volunteers through London, and contrasting them with results of hand camera snapshots in the Strand. Making allowance for the superior position chosen for the cinematograph camera, and a slightly earlier period of the day, the results must be acknowledged as wonderfully good.

* * * * *

I PURPOSELY went to one of the Music Halls in order to see what the animated photographs were like, after my own hand camera films had been developed (with an absence of detail), and when I saw the results I had a good think. Why should my films be nearly clear celluloid? was it the fault of the particular lens, shutter, or rapidity of film, or was it the confined position of a narrow street with high houses shutting out the light? After comparing notes I put down the failure chiefly to unsuitable position, and after that to a too rapid shutter for such work; for a professional photographer I know was similarly situated to myself in another part of the Strand, by getting no results, while a member of his firm with a similar apparatus got some effective pictures of the crowd in Hyde Park and the procession near the Marble Arch.

* * * * *

THOSE who had stand cameras and capped and uncapped, or who had very slow shutters, were most satisfied with their results, and one gentleman who had left his instantaneous shutter behind improvised a drop shutter, which enabled him to get some pleasing photographic records, which, in all probability, would not have fallen to his lot if his apparatus had been complete with the usual shutter. For late autumn and winter work large-aperture lenses, slow shutters, and rapid films or plates are necessities.

* * * * *

THE hold the cinematograph pictures have on the general public is not to be wondered at, for the effects on the senses are almost magical. The scenes are so vivid, that the imagination has to be taxed to the slightest extent to conjure up the original surroundings, and to fill in the enthusiastic shouts of welcome and bravos which could only be

reproduced by a phonograph or something of the sort, and so, under the circumstances, have to be allowed for mentally. In cases of marching men the swing of the bodies and the manly bearing as they step out to the accompaniment of the band (supplied by the orchestra) is summed up in the one word real. Some day not far distant we shall, no doubt, have a combined instrument that not only reproduces movements previously photographed, but also gives out at the same time the sounds that accompanied the action.

* * * * *

In a small way the records of native dancing and singing are being attempted by gentlemen connected with the Ethnological and Anthropological Societies, and by-and-by a cinematograph camera and phonograph will be synchronised so that the combinations work in perfect harmony, and motion and sound once recorded can be reproduced *ad infinitum*. These results can only be obtained at considerable outlay of time and money, and if an Edison does not come along, or the Mutoscope and Biograph Company do not succeed, the Royal Society should devote funds and form a committee with power to have constructed such an instrument. This would be invaluable in years to come if it was arranged that a national library of "records" be preserved for future generations.

* * * * *

APROPOS of my remarks in last month's Mems on 'never take your friend's photograph if you value your friend's friendship,' a friend of mine whom I have known for thirty years, and who is a celebrated professional photographer, sends me the following: "I am in a position to confirm your remarks, for a friend of mine furnished a house at the sea side and invited me to join him and bring my camera. I did so and took various groups. On my return I sent prints which were technically good. In acknowledging the receipt of them he said, 'I received the photos, and after a good laugh we put them on the fire.' How many cases occur where the prints meet with an early destruction, or are put away never to be got out again, without the same brusque statement of the fact being sent to the good-natured photographer, who had at considerable trouble to himself, and often at serious expense in time and money, desired to please his friends, and make a little return perhaps for some services rendered? The percentage of cases where portraits please the individual are small even when taken professionally, with all the advantages of studio for lighting and retouching of the negative before printing. So it is not to be wondered at that amateurs seldom succeed in giving pleasure by photographically reproducing a friend's face.

* * * * *

MEN and women are all more or less conceited, and when they look in a mirror and see their reflections they are not as critical as the lens of the camera is, which brings out their peculiarities in the matter of wrinkles, spots, blemishes, abnormally large ears and nostrils, or drooping eyelids, and thus show what is missed when looking at the face of the individual, for the animation and expression in motion

draw the attention away from any structural defect of physiognomy. Beautiful women and handsome men, when photographed, have looked quite ordinary beings, and at times almost repulsive in features.

* * * * *

ART, more art, is the cry, and the photographer who can best bring out the points of the face that will look nicest when printed is the same that will get most patronage. "Is that So-and-So? I should not have known her." It may be taken either way, as too good-looking or not good enough, according to the sincerity of the friendship.

G. R. BAKER.

LIMELIGHT MATTERS.

DISSOLVING IN SINGLE LANTERNS.

THE attempts to produce a pleasing dissolving effect by means of a single lantern only have, from the very earliest stage in limelight practice, been many, and numerous ingenious carriers have from time to time been designed to enable this popular method of projection being successfully performed.

The acme of perfection in dissolving one view or picture so that the same gradually vanishes from sight, and whereby another view is caused to take its place on the screen, has always been produced, as is well known, by the aid of two or more lanterns actuated by a simple method of mechanism, whereby the light from one of the lanterns is cut off at the same moment that the light is being turned on in the other, which is to reveal the new or coming picture on the screen, and there is little doubt that this ingenious, but, at the same time for years, mysterious method of showing pictures on the screen, was chiefly instrumental in bringing the optical lantern in great favour with the public, many of whom were not a little puzzled to understand how many of the striking effects were produced in what were termed dissolving views.

Triple lanterns, and more recently biunials, which, in the early years of limelight projections, were almost universally employed, were costly articles, and required experienced operators to manipulate satisfactorily; in fact, not only had the closest attention to be paid to the fittings of the lamp in all its parts, but much depended upon what is termed personal equation on the part of an operator, for it was almost essential to the success of an entertainment that the party manipulating the lantern should not only be conversant with the minutest detail of the same, but must at the same time have considerable practice with the various transparencies that were to be projected before the best results could be attained. In the early stages of limelight work, especially where high-class dissolving effects were to be produced, the preparation of the slides was a matter of the greatest import. This meant spending much time and attention in so packing the frames which, at that time, were used to carry the views, that these frames, when inserted in the lantern, would register in exactly the same position on the screen as the duplicate view from the other lamp was doing, for it was only by the finest adjustment that many of the striking effects could be superimposed on the vanishing view, and when these sets of particular views, specially prepared for dissolving effects, had been brought into a perfect condition for registration on the screen, there still remained the equally important factor of personal equation on the part of an operator in knowing exactly how to manipulate them.

The popularity of dissolving lanterns received a check when photographic positives were introduced. The ease with which actual photographic transparencies could be produced, as well as the great saving in expense over the hand-painted slides of early days, soon told against the employment of double and triple-deckers, and in their place single lanterns were made to do duty, until at the present day, with the cinematograph on one hand, and every Mission Hall and Society being furnished with their own lantern on the other, the truly good and royal triple, with its matchless dissolving effects, has become almost a thing unknown to the rising generation. In many respects this is to be regretted, for in the hands of competent operators a really high-class dissolving view entertainment is most enjoyable, and appeals to every class in a community both old and young, and there are those still to be found who doubtless, judging from the delight they experienced in their younger days, are bold enough to assert that such high-class entertainments as were given years ago were superior to much of the rubbish shown at the present day by means of the cinematograph. At all events, the desire for dissolving

views, or the merging of one view into another, on the screen is still shown in the attempts to produce such effects with single lanterns only.

It has been stated that what is termed personal equation played a most important part where double lanterns were employed, and it is not difficult to conceive, if such were necessary where perfect mechanism was employed, that this would be of equal import when dealing with apparatus less suitably adapted for the purpose that the dissolving taps specially designed for cutting off the gas from the lanterns.

To enumerate a tithe of the various carriers that have from time to time been designed to enable dissolving effects being produced with single lanterns only would be a difficult task. Speaking generally, such carriers have, with only one or two exceptions, never been universally adopted, doubtless by reason of the fact that their manipulation entails an amount of care and attention that is seldom forthcoming in any but the most ardent lanternists, or those who make a special point of studying the particular form of carrier they employ and the requirements necessary to work the same to its best advantage. That several extremely good forms of such accessories to single lantern projection are in daily use is well known, but the manner in which some of these carriers are manipulated by expert operators who have made a special study of their employment is perhaps not so widely known as it might be.

In one particular instance quite recently the writer of these lines was waited upon at the close of a limelight lecture, and was asked by an ardent lanternist if he would have any objections to give the information as to how the pictures had been projected on the screen during the evening, adding also, as a request, to be shown the particular form of carrier employed. On the latter being produced, much surprise was displayed by the stranger, who immediately ejaculated, "Oh, that is So-and-So's form of carrier; I used it once, but did not like it, and I never saw the same results produced with it as were seen to-night." Now, in this little episode we find the whole secret of success in the use of special forms of carriers.

Taken by themselves, such carriers go only a certain length in producing pleasing effects in single lantern projection, but, used in conjunction with other adjuncts, they yield vastly improved results, and this was just where the secret lay in the case mentioned. It was not the carrier in itself, but the manner in which it was employed in conjunction with the jet and lens that yielded the results so much admired. First of all, the entire set of slides was specially prepared in so far as the binding of the same were concerned, and, what was of equal importance, none of these transparencies were marked. The entire series were only bound at top and bottom. The reason for this will be seen later on. In lieu of masking each slide with the well-known paper mask, a metal mask was employed, which was a fixture in the rear of the carrier. By this means every slide shown was seen projected with one and the same shape of mask, a method first employed and recommended, if the writer mistakes not, by that clever lanternist, Mr. Chadwick, of Manchester. Not the least advantage accruing to this form of working lies in the certainty of always throwing each view on exactly the same spot on the screen, for this cannot fail where the lamp and carrier are rigidly fixed, the former on a rigid support, and the latter tightly wedged into its place in front of the condenser.

The form of carrier employed was that in which the coming slide is rapidly slid by means of a plunger in front of the view on the screen, and then, by redrawing the plunger, the previous slide is withdrawn, and at the same moment the same movement sets the front slide backwards into the exact plane the vanishing slide occupied in front of the condenser. The speed with which these changes can be performed is very great indeed when such is desired, but the best effects are probably produced by a slower manipulation of the plunger, and so working the rack and pinion of the objective as just throws the vanishing slide slightly out of focus at the moment the coming slide is being rapidly run across the face of the other, and when an operator becomes expert in the use of this form of carrier, and knows how to utilise the cut-off attachment of his single jet, so that he just lowers slightly his light at the same moment as he redraws the plunger of his carrier, perhaps the nearest possible approach to a dissolving effect in single lantern projection is the result.

A good form of mixing jet ought to possess a cut-off attachment. In the one employed on the occasion referred to the movement first cuts off the oxygen entirely, or partially, according to the distance the lever is moved. When the oxygen is entirely cut off the hydrogen is left still burning as a good bypass admits of being done when dis-

solvers are employed in double lantern work, and then by again moving the lever of the cut-off movement the full volume of light is immediately passed through the slide.

Only a very little practice is required to enable an ardent lanternist to become quite an expert in working a single lantern as to yield pleasing effects in dissolving one view into another when such form of apparatus is used.

The slides having no opaque binding or edges such as would be the case were they bound up with paper masks in the ordinary form, permits of the front slide being rapidly placed in front of the other without being visible, for the coming slide is so far in front as to be out of focus, and where, just at the moment of changing, a slight turn of the screw of the objective throws the lens out of focus, the effect, especially when the cut-off movement of the tap on the jet is cleverly manipulated, is very good indeed, and often experienced lanternists in a hall are puzzled to learn how the thing is done.

Personal equation, no doubt, plays an important part in this method of working also, but it is only by carefully thinking out for oneself that much in connection with such lantern projection can be effected.

T. N. ARMSTRONG.

BELGIUM—A RETROSPECT.

I.

The late Queen Mary is credited with having said that when she was dead the word Calais would be found written on her heart. I have never read whether any means were taken to verify her statement, probably not, and perhaps it was quite as well, for I cannot help thinking that if it should have been proved that our sincerest affections were always recorded on that important organ, and post-mortemisation (registered) became the custom, the results might occasionally be very startling, and perhaps make a very serious difference in the amount of regret or respect paid to the memory of those who had gone over to the great majority by those who had yet to shuffle off their mortal coil.

But, allowing for a moment the possibility of our affection being thus recorded, I have little doubt that in my own case (when examination time came) there would be a little snug corner inscribed Belgium.

The reason for this is not far to seek, and "thereby hangs a tale." When quite a youth I made the acquaintance of a gentleman who for many years had been going backwards and forwards to Antwerp and Brussels; and from him I heard of Flushing and the quaint dresses of the Zeelanders, of the winding Scheldt, of Antwerp's beautiful cathedral spire, which appeared now on the right, now on the left, as you neared the city; of the rows of old houses, restaurants and warehouses on the Quay, with its "nubby" little paving stones and fine trees; of the wonderful silvery-toned bells in the tall lace-like tower; of the beautiful interior of St. Jaques, of the Calvary and carved oak at St. Paul's; of the magnificent pulpit of St. Andrew's, of the winding streets with the little saints at the corners, and the little oil lamps swinging before them in the sunshine; of the marvellous processions through the principal thoroughfares on the 15th of August; of Brussels and its Guild houses, its old Town Hall; its Cathedral of St. Gudule, with its old stained glass and its elaborately carved pulpit, its gorgeous grand altar of white marble, its rows of graceful pillars decorated with sculptural saints ten feet high, and then the stories of its patron saint, St. Gudule. How that, on one occasion when she was at prayers, the devil blew out her candle—but it was instantly relighted by a superior power. How the good saint died in December, 712, and when she was buried in the following month the trees in the neighbourhood threw out their leaves and blossoms as her funeral procession passed, and some even followed her to the church doors, and planted themselves round the porch.

These glowing descriptions and interesting legends naturally created a great desire on my part to visit Belgium. The opportunity came in 1863, and on a fine Sunday morning in July I left the pool in the "Baron Osy" on my first Continental trip. About ten the next morning we passed Flushing, and entered the Scheldt, which at this point is about three miles wide. The entire country is flat, and nothing of interest occurred until the steamer neared the village of Lillo. Then a boat was pulled out from the shore, and in it was an officer evidently of some importance. The gangway ladder was lowered, and with much ceremony the illustrious stranger reached the deck. While I was wondering who this gaily-clothed individual could be, he took off his white gloves, drew from his coat pocket a flag about the size of a pocket handkerchief, and tied it to one of the side ropes.

This important operation performed, he lighted a cigar and surveyed the ship with the satisfied air of a man who has bought one side of a street and is negotiating for the other. He nodded familiarly to the little Flemish pilot who took charge of our steamer at Flushing, and when he had finished his cigar he began to examine our luggage. Lo and behold, he was only the Douanier, and, considering the authority and uniform with which his Government had clothed him, he was a very courteous and obliging officer.

On went our boat up the serpentine Scheldt, and about one o'clock we neared the City. On past what used to be called the Big Dock, then the Little Dock, the Canal, the Steen Prison, and in a few minutes we were safely moored in front of the Old Hotel Danemarck.

How much all this has changed since then. The pilot still comes on board at Flushing, but the Customs officials do not make their appearance until the ship is berthed. Long before this, however, the great new North Docks—covering nearly 500 acres—will have been passed. These are now connected by a network of railways running down to the quays, where Atlantic liners and similar vessels may be found in large numbers; and, in place of the old houses and tree-shaded roadway, will be seen more than two miles of riverside galvanised iron sheds, intersected by railway trucks, hydraulic cranes, and every convenience for the rapidly increasing business of this important maritime city.

Any one anxious to see the great difference 55 years has made in Antwerp should first consult an immense oil painting by R. Mols to be found in the Museum, and then take the ferry-boat across the river to the Tete de Flandre (50 centimes return). He will then not only more easily realise the alteration, but can, if he has a camera, get some capital pictures at the little old village of St. Anne.

But if there is so much change on the river-side of Antwerp, what has there been in the city? The Place Verte is still the best known of its open spaces. The trees have, of course, grown considerably. The flower market is still held here, but the large bouquets (made on a sort of frame, and measuring perhaps two feet in diameter), which it used to be the regular thing to buy to take home, are things of the past—there is no demand for them. In the old days the steamers sailed from the Quay van Dyck, about five minutes walk from the flower market. Now, ninety-five per cent. of the tourists travel via Harwich, the boats go every week-day, and the Quay du Sud is nearly two miles from the flower market; besides, in the old days, passengers from Brussels drove through the city from the old station past the Place Verte. Now, the Brussels train brings its passengers to the side of the steamer. Many of the old buildings have been improved out of the Square. The statue of Peter Paul Rubens still occupies its centre, with the privilege of being snapshotted 20 times a day thrown in. There is still a band performance here two evenings a week, and the place is still illuminated with coloured lamps on special occasions; but, in place of the few instrumentalists and few lamps of years ago, I this year heard a band of 40 performers, and saw the Square illuminated by about 5000 Chinese lanterns.

The Marche aux Bouliers is still the same, and the top of it is as narrow as ever. Then comes the well-known Place de Meir, at the top of which is a narrow neck leading into the Avenue de Keyser. This narrow part has often been a puzzle to many (it will not be so much longer, as it is being cleared away, and fine new buildings are being erected on either side of the widened area); but, in 1863, and for several years afterwards, the city terminated at this narrow neck. Here were the old fortifications and a drawbridge and moat; and the space on either side of what is now the Avenue de Keyser, and the Boulevards, with their fine statues and beautiful trees, was practically fields. The fortifications are now nearly eight miles in length, and the removal of the ramparts to their present position has allowed the town to expand to six times its original size. It has been said that the fortifications look far more formidable than they really are. They are well worth seeing, but it sometimes saves trouble on such excursions if the camera is left at home.

Of course, the great glory of Antwerp is its cathedral. The restoration of its exterior has been going on, more or less, ever since I first saw it. Little shops at that time were built in all round it; these are being gradually cleared away. The north and south porches were in a very dilapidated condition, but during the last few years they have been practically rebuilt. The interior (with the exception of the enlargement of the organ gallery and the rebuilding of the organ) remains much the same as in 1863. It is considered the largest and most beautiful Gothic Church in the Netherlands. It is nearly

400 feet long, and I remember well, on the occasion of my first visit, being much impressed by its beautiful nave and side chapeis. How many times I have seen it since I should not like to say, nor under how many different conditions. In its ordinary every-day aspect, with the pictures covered up, and its few straggling worshippers, from the good Catholic who goes faithfully through his rosary, to the poor woman who, with her heavily-laden basket of eggs, fish, or fruit, merely calls in on her way to market just to say a prayer or two, and, taking up her basket, walks away with a lightened step. With its parties of tourists, who, Baedecker in hand, walk about the place and talk as loudly as if they were in Trafalgar-square. Again, during its "close time," when the pictures are uncovered on payment of a franc each person, and the building becomes a part of a secular show. On a Good Friday, when it is profusely decorated with violet and white drapery and flags; when its large cross, swinging from the mighty roof, is covered with crape. On an Easter Sunday morning, with the sun shining through its coloured windows, its beautiful pictures surrounded by eager pilgrims to this Rubens' shrine; its banners, candles, and gorgeous dresses, and its spacious nave and side chapeis filled with worshippers listening to the glorious strains of Haydn's Imperial or Mozart's (so-called) Number 12.

But possibly the most moving spectacle I ever witnessed within its walls was on August 9 this year, when a solemn service was held for the repose of the soul of the late King of Italy. Long banners and streamers of black cloth, relieved by silver stars hung loosely from the roof, or were looped up to the pillars by large rosettes. Pyramids of candles were on the high altar, a large black screen divided into four by a white cross, each section being ornamented by what used to be known as a pirate's flag, covering Rubens' beautiful "Ascension." The elaborately-carved stalls, decorated with black cloth, the lighted lamps covered with crape, the entire space between the nave and the alter occupied by burgomasters, diplomats, consuls, and the highest officials of the city and surrounding districts in all the most gorgeous uniforms and robes appertaining to their position; the full band, soloists, and chorus in the organ gallery rendering Mozart's "Requiem"; every available space almost packed with people assembled in memory of a good King who had been foully murdered; and in the midst of all this a mighty catafalque, with its purple, crimson, and gold drapery, rising some forty feet from the floor, and its base surrounded by about 200 large lighted candles. It was a scene of great solemnity and grandeur, and would have been more impressive still if we could only have forgotten that the coffin which crowned the pile, and which had been so solemnly blessed and incensed, was only an empty box.

I was just thinking how impossible it would be for photography to give anything like a faint idea of the scene, when my musings were interrupted by a young lady tourist, who pushed in front of me, stood on a chair, raised a hand camera, and snapshotted it. I have often wondered since whether the satisfied smile with which she changed the plate was present when she developed it.

When I first went to Belgium I was not on photography bent, the reason probably being that at that time practical photography and I were strangers; but I have made many and many a journey since accompanied by the camera. No, in 1863 I knew very little about it; and, judging by the results obtainable there at that time (more especially outdoor work), the Belgians were in the same condition. The swing back (which, notwithstanding its threatened extinction a few years since, is still, by many, considered an advantage) was at that time unknown, as the inept appearance of the tall buildings in confined situations testified. But I was naturally anxious to obtain pictures of some sort, and the only things available worth having were lithographs. Some of these were good of their kind, but the majority were very incorrect. Why this should have been I do not know. For instance, take the cathedral front of Antwerp, the width and height of this were well known, yet when, in later years, I compared the lithograph with a camera picture the proportions were wofully "out."

My first photographic experience was in 1866, when, flushed by the full fever of amateur photography (there was such a thing even then), I took across the Channel a complete wet-plate outfit with the idea of immortalising some of my friends. I am afraid that in all cases I did not quite succeed. Some pictures were satisfactory to the sitters; some were not—a state of things by no means unusual even at the present time. As to the immortalisation, well, I was looking recently at some prints from the negatives made on that journey, and, although

on the poor maligned albumenised paper, most of them are as good as ever.

It was not until the advent of gelatine, and I had then been looking upon photography from the bread and butter side for some time, that I began to take views in Belgium; and then, as opportunity offered, I did all the best-known parts of it—Antwerp, Brussels, Bruges, Ghent, Malines, Liege, Chaundfontaine, Namur, Dinant, and dozens of other more or less well-known places. On some of my trips I was fortunate in having excellent companions. In 1883 I had one who was much interested in photography, and has since employed it very largely in hospital work. It was with this gentleman's assistance I obtained—without permission from the authorities—a negative of the colossal white marble bust of Rubens, which had recently been placed in the vestibule of the Old Museum (now the Academie). The officer in charge of the doorway was on one of the seats outside enjoying a cigar. There was no attendant in the vestibule, and the temptation was not to be resisted. My friend kept an eye on the gentleman smoking under the trees, and by the time he had finished his cigar I had packed up and was leaving my camera case in charge of the porter at the top of the stairs.

The year following (1884) there came to me in Antwerp a friend who was at that time engaged on one of the journals. I well remember going down to the Harwich boat to meet him, and, being afraid he had missed it, as all the passengers seemed to have come ashore. At last, however, I saw the top of a "stove-pipe" hat above the gunwale; my fears vanished, and in another minute my friend, whose entire luggage was contained in a large open-mouthed black bag, which I have often seen since, appeared at the gangway.

I have recalled the incidents of that journey many times since, more particularly when visiting the Musee Plantin. Many people pass through Antwerp, and know nothing of this museum, and yet it is most interesting. It presents a very fine example of the way in which some of the old Flemings lived and carried on their businesses under the same roof. Here Christopher Plantin set up his printing office in 1555, and for nearly 250 years it was carried on here by his descendants. The place remained practically closed for about 75 years, but fortunately its old furniture, tapestry, and paintings remain undisturbed, so that in 1875, when the Corporation of Antwerp purchased the house and contents, it obtained a unique reminiscence of the old city.

F. A. BRIDGE.

LECTURING WITHOUT AN OPERATOR AT THE LANTERN.
The accompanying diagrams will serve to illustrate a system of lecturing without the assistance of an operator at the lantern. It is a well-known fact that with the usual limelight apparatus such assistance is absolutely indispensable; indeed, if he would do his work in every respect satisfactorily to the lecturer, the limelight operator is fully occupied in turning the lime, regulating the gas, adjusting the focus of the objective, and with the insertion of the slides at the desired moment. All these operations, however, are dispensed with by adopting the system which we propose here to describe. In the first place, the usual limelight is substituted with a 210 volt 50 candle-power focus incandescent electric lamp, simply connected to the main installation of the hall in which the lecture is being given. The advantage of using such a lamp is that an even light is secured which requires no attention whatever after it has once been switched on. For instance, in our first illustration, fig. 1B, is supposed to be one of the lamps of the hall, or, rather the shade of one of the lamps, for in reality the lamp has been removed and replaced with a male connection at the end of the flexible wire, *r*, at the other end of which is connected the 50 candle-power lamp in the lantern at *P*. We next come to the matter of inserting the slides, but, before dealing with the particular way in which these slides are prepared, we should say that the staging is somewhat altered from the usual arrangement. In short, between the two lenses forming the condenser, *x* and *L* (fig. 2), a mirror, *m*, is placed. This mirror is hinged at the bottom as shown, and is provided with a side wing, *x*, by which it is retained at any desired angle. The light emanating from the lamp is thus reflected from a horizontal to a perpendicular direction, and the position of the slide to be projected upon the screen is also changed from the vertical to the horizontal position. The object of this change in the position of the slide is to increase the distance between the lamp and the film, which really bears the image to be projected. The objective

lens is screwed into the top of the compartment in which the parts just described are contained. The objective is furnished with a mirror, c—needless to say, this mirror consists of plate glass silvered on the front surface, so that the reflected images are perfectly sharp. The novelty of the whole system lies in the construction of the mechanism by which the slides are brought successively into place for the purpose of exhibition. The illustrations the lecturer desires to show are printed by contact on a continuous roll of film similar to that used in the camera, but, of course, prepared according to the requirements of contact printing. The diagrams or photographs required for the lecture having been prepared, the two ends are joined together. We will now describe the mechanism as shown in fig. 3, which is a view of the apparatus with the front removed. There are four rollers, q q q q, acting as a guide to keep the film in the proper

tures upon the screen are thus passed in panoramic order before the audience, without any confusion, and exactly at the right moment. It is obvious that by such a system it is quite impossible for the slides to get out of order, whilst, dispensing with an operator, the lecturer is saving much expense, especially if he be a traveller. It should have been mentioned that the rollers of the apparatus turn on spindles attached to the front side of the framework, so that the opposite side of the framework may be removed without interfering with the mechanism of the film-carrier, also that the object of the mirror, c, is to reflect the light rising from the condenser, L, in a horizontal direction towards the screen.

THEODORE BROWN.

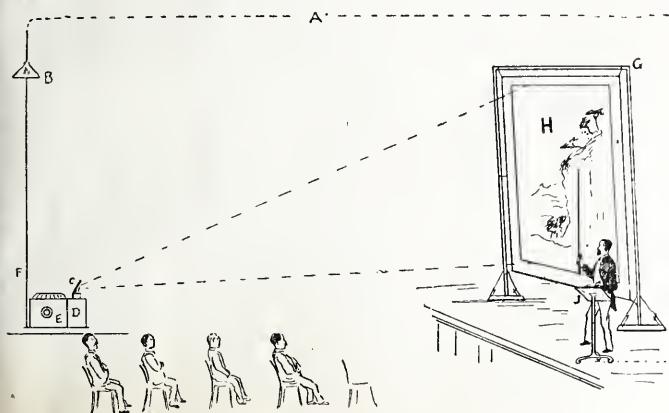


FIG. 1.

position over the horizontal condenser lens, L, and another similar roller at w. The roller, v, attached to the spring, u, is caused to press lightly against the film as the latter passes up between it and the side of the box. It should be mentioned here that the side of the box, and also all the rollers, are covered with velvet. At t there is a roller attached to a spring, s, which causes it to press against a larger roller, r, and it is to this latter roller that the motive power is attached. On the opposite side, or rather at the opposite end of this roller, a spring is attached in such a manner as to cause it to revolve when freed from a catch. Thus, one half revolution of the roller, r, causes the film to pass on exactly the length of one slide, from left to right, and as it passes between the two rollers, r and t, it is at the same time kept taut by being pressed by the roller, v, against the side of the box. The work generally done by an operator at the

NOTES ON LANTERN-SLIDE MAKING.

At the Richmond Camera Club, on October 29, Mr. E. G. Richardson gave a demonstration on "Lantern Slides by Reduction." The apparatus required was practically two cameras, one of size sufficient to hold the largest negative from which a reduction was to be made; the other, a quarter-plate camera to hold the lens and lantern plate. The two cameras are fixed on a baseboard provided with means for focussing the negative the required size on the ground glass of the quarter-plate camera, which should be provided with a mask of the size of the desired image on the lantern plate. This done, a lantern plate is put in the dark slide of the quarter-plate camera, to which pieces of cardboard are adjusted so as to keep the plate in the middle of the opening. Some burning magnesium ribbon is then waved over the surface of the negative, in front of which a piece of ground glass is placed in order to distribute the light evenly, and the lantern plate is developed in the usual way. In order to ensure success, one or two points require attention: 1st, the ground glass must not be too near the negative, the distance being from three-quarters to one inch at least; and, 2nd, care must be taken to wave the burning ribbon well over the margins of the negative to ensure their being properly illuminated. Mr. Richardson made two slides on rapid Paget lantern plates from quarter-plate negatives. The quantity of wire used in each case was five inches, and the stop of the lens (a 5½ inch Wray rectilinear) f-16. One of the slides would have been better if f-22 had been used, as the negative was thin.—A vote of thanks to Mr. Richardson terminated the proceedings.

At the meeting on November 5, Mr. Henry Little discoursed on "A Tour in Italy, Algeria," &c., illustrated by a number of very fine slides by himself. In order to complete his collection, he also showed some slides bought in Italy, and illustrating scenes which he had been unable to photograph himself. Ladies were invited to be present, and a large number availed themselves of the invitation. Mr. Little was accorded a hearty vote of thanks at the conclusion of his lecture.

On November 12, Mr. Emery gave a most instructive paper on "Hints on Hand-camera Work." At the close a general wish that the paper should be printed for circulation among the members was expressed, and a cordial vote of thanks to Mr. Emery was passed with applause.

On November 19 a lecture by the Rev. F. C. Lambert on "Exposure and Development" was read. Mr. Lambert went very fully into the subject, and his remarks were illustrated by lantern slides designed to show the different results of over and under-exposure and over and under-development.

On November 26 Mr. J. D. Gibson gave a demonstration on making lantern slides by contact. He pointed out that any one wishing to pursue this class of work should see that his negatives were so taken as to enclose the desired view within the limits of a lantern plate. He proposed to use Alpha plates, with which a good range of colours could easily be obtained, and which were sufficiently slow to admit of the various operations being conducted in a room lit in the ordinary way. Mr. Gibson passed round some slides on Alpha plates which fully bore out his statements, and showed the result to be obtained by toning the developed image in the combined fixing and toning bath recommended by the Ilford Company, who make the plates. He then exposed two plates, giving each a different exposure, so as to demonstrate the different results obtainable by development alone, and two very successful slides were produced. He also made a slide from a negative provided by one of the members, and, although of a very different character from his own negative, a good slide was produced. He then demonstrated the ease with which an over-dense slide or over-

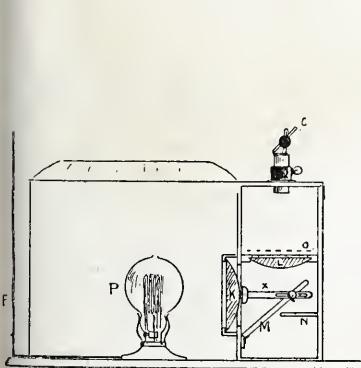


FIG. 2

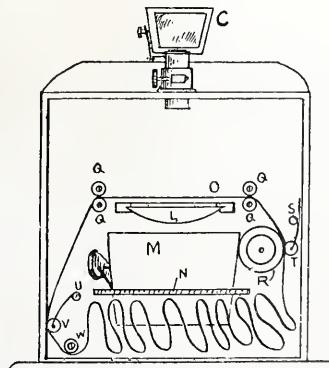


FIG. 3.

lantern is thus accomplished by the lecturer himself in the following manner:—Having wound the spring of the roller, r, and set the electrical catch, which is connected by wires to the lecturer's reading desk, j (fig. 1), and, having switched on the 50 candle-power lamp, the lecturer is ready to commence his novel performance. The first image on the film may consist of a title or a tinted curtain, which will appear to be drawn aside when operations begin. The change of pictures is effected at the desired moment by the lecturer pressing a button at his reading-desk when the circuit is completed, a current sent through the wires releasing the catch of the roller, r, and allowing it to turn half round, drawing with it the continuous film just far enough to bring the succeeding picture over the horizontal lens at L. The pic-

dense portions of it could be reduced by means of the ferricyanide reducer, and he finished his demonstration by masking a slide with binding strips and binding it very expeditiously. Mr. Gibson was heartily thanked for his interesting demonstration.

—♦— LANTERN LECTURE ON CORSICA.

At the weekly meeting of the Kingston and District Photographic Society on Monday, November 26, Dr. Munyard, one of the Vice-Presidents, delivered an interesting lecture on "Corsica" before a very large attendance. The doctor having been briefly introduced by the President (Rev. G. I. Swinnerton), commenced his lecture, which consisted mainly of running comments on some 150 slides of photographs taken by him last winter during his holiday in the picturesque French island. The slides were of great technical excellence and artistic merit, and were of such a diversified description that, although the lecture lasted over two hours, the interest of the audience was always maintained. Though not of large area—being some 150 miles at its greatest length—Corsica, with its wild and romantic scenery, offers opportunities for the most charming landscapes, and Dr. Munyard had used his camera to good effect in choice tit-bits, as well as in the scenes of awe-inspiring grandeur. Intermixed with these scenic pictures were typical portraits of the quaintly and plainly-clad peasantry; and views of some of the more imposing buildings of the island. The statuary of Napoleon I. called to mind that the greatest of all Frenchmen was first a Corsican and secondly a Frenchman, having been born at Ajaccio, a town of which the lecturer had much to say and many views to show. Another historical matter touched on was the occupation of the island by the British a century ago, after Paoli had vainly struggled for its independence. The island was the reputed home of the brigand, to whom the rugged nature of the country would afford shelter. Some of the hills appeared at first sight to have been shaped by human hands for military purposes, this somewhat curious formation being common. Corsica was known in that part of Europe as the Emerald Isle, and though it contrasted in scenery to the island nearer home known by that name, it was not unlike it in racial characteristics. The two centres of population, Ajaccio and Bastia, might be described respectively as a pleasure resort and a commercial town. The houses in these places, as also in the villages, reached as high as eight storeys, and it was totally impossible for a stranger to gain any idea of the population, for in some instances one building would house between one and two hundred people. The lecturer showed many specimens of plant life, which was very profuse, and he stated that some plants which grew in England merely 18 inches high attained three and four times that height in Corsica. Dr. Munyard also described various trips he took into the interior of the island, displaying views taken by the way, a number of them being snapped whilst the train was in motion. A feature of the slides was a quantity of panoramic views, which gave excellent ideas of various places.

—♦— ANIMATED PHOTOGRAPHS: A PROTEST.

This, we are told, is the age of process, writes a correspondent of "The Outlook." Civilisation, urged onwards by science, is fast galloping to perfection, to the millennium of the poets. Electricity, the latest good fairy, enlightens the way and smooths the path, and the dawn of the twentieth century gives promise of yet more bewildering progress. Among other of the glorious inventions of the closing century that have been rendered possible by electricity is the animated photograph, sometimes termed the biograph or the cinematograph—barbarous word.

In the early days of this unquestionably clever invention we were regaled with the "suggestive" style of picture, unanimously popular with the crowd, and therefore highly profitable to the proprietors. Decency was in perilous danger of losing itself, and the discreet curtain was drawn on the photograph sufficiently late to allow the imagination to wander excitedly over the chasm-edge of prurience. This variety of the animated photograph still lingers in the penny peep-shows which have sprung up like mushrooms over all the country. But in the most ambitious shows of the music-halls and variety theatres, it gave place to what may be termed the "brutal" class. We had, and still have, a life-like representation of the prize-fight, without the

blood and sawdust and foul language, it is true, but one can almost hear the thud of the sledge-hammer fists, the gasps of the fighters and the groans of the vanquished.

A few months back the country was shocked by the descriptions of the bull-fights which had become popular in Northern France. In England we had a "Cinematograph Bull-fight!" O nation of hypocrites! At a certain theatre in the heart of intellectual London I saw a most complete and vivid series of photographs of a Spanish bull-fight, which could have been hardly less revolting than the actual affair. Of the perceptive faculties excited by attendance at a bull-fight, the chief, the visual sense, is gratified in almost as complete a manner by the animated photograph, and but a small amount of imagination is necessary to enable one to fancy himself present at the real thing. I shall never forget the sickening charge of an old blinded horse by the infuriated bull. Its dying shriek will live in my imagination, as it rolled over with the blood pouring from its side, half staggered to its feet and dropped dead. Yet these pictures were vigorously applauded and apparently pleased the taste of the enlightened British public.

The latest stage is the "sacrilegious" picture. In a certain part of the Continent the peasants amuse themselves and attract sensation-seeking tourists by mumming the life and death of Christ. We have our own affairs to attend to and amend, and if we object to their peculiar ideas of play-acting and religion we can stop away. But the animated photograph has brought the thing into this country, and on the pier at a sea-coast town, a week or two back, one could see every Sunday evening the "Passion Play of Ober-Ammergau" faithfully represented in the biograph. Here in the centre of Christendom, in the diocese of Canterbury, the crowd is mildly amused by the dying agony of a stage Christ on the cross, and rushes off the pier for the "last drink" after gaping admiration at the naturalness of "the Last Supper."

Such is the record of the animated photograph; indecency, brutality, sacrilege—steps in the ladder of progress, ironic sign-posts on the march of civilisation. "Realism" is the cant word of the day. The great British public likes its pleasures hot and strong and real. But this pandering to the gross and brutal appetite of the crowd—is it not going too far? Is it not time to put the foot down, or are we content ourselves with the "laissez-faire" policy, so dear to the heart of the governing powers of England, and stand idly by to wait till it hangs itself with the long rope?

CAPT. LASCELLES DAVIDSON'S IMPROVEMENTS IN CINEMATOGRAPHS FOR TAKING AND PROJECTING PHOTOGRAPHS IN COLOURS.

[Patent No. 23,863 of 1899.]

SUCCESSION exposures are taken behind different coloured screens, three in number according to the usual method, so that in the complete series of negatives every third exposure is taken behind the same colour screen. To view the resulting pictures, positives are made which may be dyed to the correct colours complementary to the colour screens, or it may be exposed behind colour screens similar to those employed in taking the photographs, these colour screens moving successively into position giving the effect of a moving coloured picture.

The colour screens or light filters consist of three stained glasses or sheets of celluloid or other transparent material coloured in the required manner. These screens may revolve at the back of the lens or just in front of the sensitive film or if three diaphragms are employed of different sizes they may be fixed in the said diaphragms which revolve or slide at each exposure. In any case the screens are made to revolve or slide either at the back or front or between the combinations of the lens, so that when the apparatus is put into motion to photograph an object the screens successively of red, blue-violet and green or yellow colours revolve or slide into position in time with the change of film and release of the exposing shutter. To give different exposures to the sensitive film according to the colour employed the colour screen may move in a variable manner as herein-after described or the diaphragms of the three different apertures may be caused to drop into position after or before each exposure to limit the action of light in any required proportion.

By the arrangement employed, the film, colour screens and the different sized stops (if employed) as well as the shutter work automatically and in exact time with each other.

The accompanying drawings show a method of applying the invention in connection with a revolving shutter apparatus such as is at present employed, the colour screens rotating immediately behind the shutter.

"Fig. 1 is an elevation of part of the interior of a cinematograph apparatus showing my colour screen fitted to the revolving shutter at present employed;

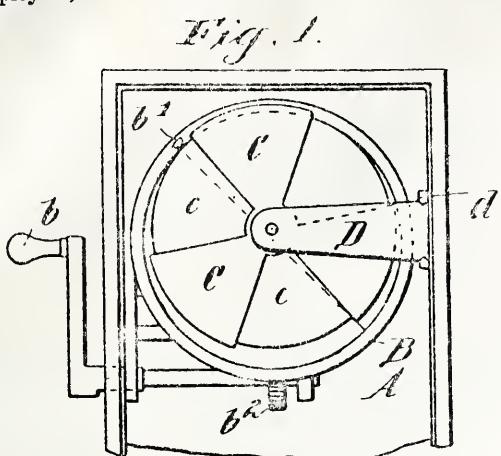


Fig. 2 is a similar view with the shutters and screens removed to show the gearing;

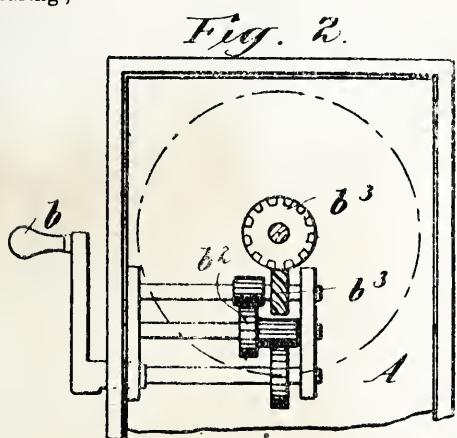


Fig. 3 is an elevation with the case in section at right angles to figs. 1 and 2; and

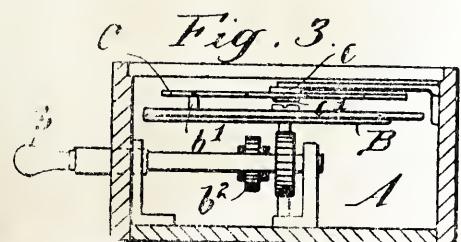
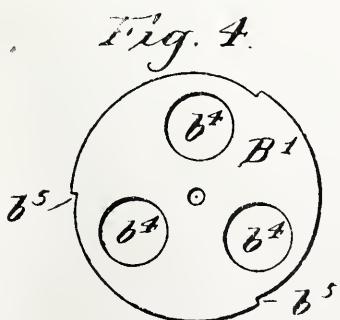


Fig. 4 shows the different form of screen more especially suitable for reproducing the photographs.

As the other parts of the apparatus are of any well-known construc-



tion, I have shown only those parts which are necessary to an understanding of my invention.

A is the case of the apparatus which is placed in front of the

camera or reproducing apparatus, and this case carries behind the lens aperture the revolving shutter B which is turned at high speed by suitable mechanism. In the apparatus shown the handle b serves to revolve the shutter, through the toothed gearing b² and the worm wheels b³ one of which is upon the spindle of the revolving shutter. These parts form no feature of my invention, and the shutter B may be rotated in any convenient manner.

In front of the revolving shutter is placed in three colour screen C having the coloured transparent plates c of the three colours required fitted between the arms forming the body of the screen. As already mentioned the body of the screen may be formed of vulcanite or other light, opaque material.

This screen is carried by the detachable bracket D the end of which is bent down and fixed by means of the plate d to the side of the case A. The bracket is fixed so that the pivot of the screen is eccentric to the revolving shutter and to adjust the tightness of the screen preventing it turning too freely the small nut c¹ is employed which can tighten the screen to any required extent.

On the revolving shutter B I fix a pin b¹ which projects from its surface to a suitable height and is adapted to engage the corners of the three arms forming my screen and to carry the screen round with the shutter the required distance for each revolution. As the screen is eccentric to the shutter the pin engages at each revolution with one arm, turns the screen over about one-third of a circle before it disengages and at the next revolution operates on the succeeding arm. Once in each revolution a fresh colour is thus brought behind the exposing aperture the next exposure being through the succeeding colour and so on each colour repeating at every third exposure.

By placing the pin b¹ on the exposing shutter in a certain position the revolving colour screens can be moved out of exposing position to bring the opaque part behind the lens aperture after a certain short interval of time which could be made to vary according to the colours by making the parts of the three colour screen of different proportions. Or three pins such as b¹ may be employed at different heights to engage successively the arms of the three colour screen, the position of the pins determining the exposure intervals of the respective colours. Instead of these methods being employed equal exposures may be given and the blue and green screens may be made to equal the red screen in actinic intensity by adding an extra screen of yellow or smoked glass, or any other means of equalising the colours may be employed.

The screen B¹ shown in fig. 4 acts in exactly the same manner as that described, but I prefer it for use in reproducing photographs. It consists simply of a disc of vulcanite or like material having the apertures b² filled in with coloured transparent material of different shades to the colours employed in the photographic screen. The edge of the disc is notched at b³ and the pin on the revolving shutter engages in these notches, turning the screen as already described."

THE NEW PRESIDENT OF THE ROYAL SOCIETY.

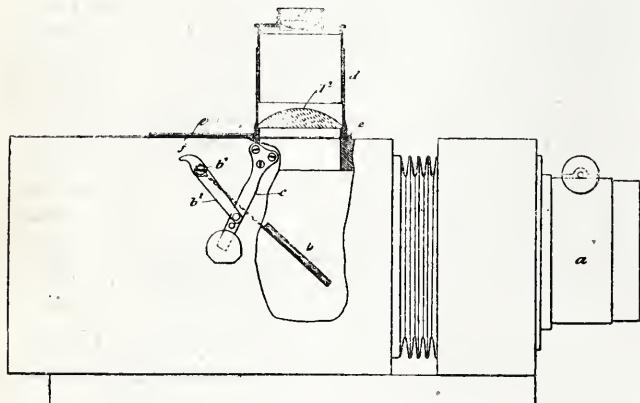
SIR William Huggins may be regarded as the father of astrophysics in this country, writes a daily contemporary. The year 1859 was epoch-making for science. Within twelve months Darwin announced the law of Natural Selection, and Kirchhoff invented the spectroscope. Three years earlier Dr. Huggins had erected a house at Tulse Hill, with an observatory attached. Kirchhoff showed that several terrestrial elements were to be found in the sun; Huggins determined to direct the spectroscope to the stars to discover, if possible, whether they also were formed of the same materials. The task seemed almost hopeless, for the light of a first magnitude star is forty thousand million times less than sunlight. Nevertheless, he and Dr. Miller, of King's College, set to work, devised new instruments and methods, and ere long proved that in the star Aldebaran were to be found sodium, magnesium, hydrogen, calcium, iron, bismuth, antimony, mercury—similar constituents to those that go to make the earth. In other words, the universe was one in materials. In 1862 Huggins examined the bright comet of that year spectroscopically and found it to be radiant with the luminous vapour of carbon. Nothing was ever done in that chamber of marvels, the theatre of the Royal Institution, more wonderful than when Dr. Odling illuminated it with gas brought to this world by a celestial meteorite. Dr. Huggins' discovery went to confirm Dr. Odling's theory that carbon, at least, was one of the constituents of comets. The most remarkable of his achievements was to make the spectroscope the measure of a star's motion towards or away from the earth. This was accomplished by observing how much the lines of the spectrum were shifted according as the star receded or came nearer. By this means the proper motions of stellar objects can be measured with considerable accuracy, and at some distant date astronomers may be able to form a plan of the visible heavens, as they can now of the solar system. As in Lord Lister's case, a supreme moment came in Sir William Huggins's career. It was on August 29, 1864, when he first tried the spectroscope on a

nebula—the one in the constellation Draco. He has himself described the feeling of suspense mingled with awe with which he put his eye to the spectroscope as if peering into a secret place of creation. "I looked into it. The spectrum was not what I expected. There was a single bright line only. But the riddle of the nebula was solved. The answer which the light gave was this: 'Not an aggregation of stars, but luminous gas.'" In other words, the astronomer at Tulse Hill, out of the murky atmosphere of London, had been the first of mortals to see and know that he had seen a sun in the making. The idea has been developed by Secchi, Vogel, and others; stars can be classified as young, mature, old, and declining; and there is scarcely more doubt about celestial than of terrestrial evolution. The metropolis is honoured by the rare fact that both the outgoing and succeeding President are Londoners. Sir W. Huggins is 76 years of age, and since his marriage, in 1875, has been ably assisted in his researches by Lady Huggins.

AN IMPROVED EYEPIECE FOR FOCUSSING.

[Dallmeyer and Aldis's Patent, No. 12,759 of 1900.]

An eyepiece carrying its own screen is employed for focussing. For



this purpose the front face of the front lens of the eyepiece is "ground" or "greyed," so forming the screen.

The eyepiece is removable preferably fitting into guides on the top of the camera, the image being reflected into it by an inclined mirror inside the camera.

The drawing is a side elevation partly in section of a camera constructed according to this invention.

'a' is the lens, 'b' the mirror carried by the shaft 'b¹' to which is fixed the handle 'b²' on the outside of the camera. 'c' is a spring for retaining the handle 'b²' and mirror 'b' in position. 'd' is the eyepiece consisting of two plano-convex lenses 'd¹' 'd²' the plane surface of the lower lens 'd²' being ground or greyed. The eyepiece 'd' slides in guides 'e' in which also works a slide 'f' to cover the opening when the eyepiece is removed.

The lens 'd²' is capable of being adjusted in a vertical direction with relation to the mirror 'b' and 'd¹' is capable of being adjusted with relation to the greyed surface of 'd²'.

IMPROVEMENTS IN DEVELOPING DISHES.

[Levi's Patent No. 17,852 of 1899.]

THE developing dish is provided with a special cover of adiactinic material, either transparent or otherwise (to non-actinic light), as thin metal, opaque celluloid, ruby glass, or any other appropriate material. A peculiarity of the cover is that two or three of its edges are "turned over" into the form of inwardly directed grooves, while the third or fourth edge of the flat rectangular cover is left uncurled. In the direction of the plane edge, the cover is made somewhat broader than corresponds with the superficies of the developing dish it is intended to protect, and as the curled or retroverted edges of the cover correspond with the shape of the projecting lips of the developing dish, it is evident that after immersing the sensitive plate in the developing, toning, fixing or other bath, this protection cover may be slid on, and thus sufficiently securely fixed, and when necessary removed again with the utmost facility. Celluloid, and other developing, toning, fixing and the like dishes are now commonly made with such expanded lips as are appropriate to the use of my invention, but, alternatively the dish may be specially made with an inner groove in the uppermost portion of either two or three sides, whilst the fourth or third

fourth side is made somewhat shallower to admit of the introduction of my sliding cover, which under these circumstances would simply consist of a rectangular flat plate, the edges not being turned over. Figs. 1 and 2 are sections at right angles to one another of a de-

Fig. 1.

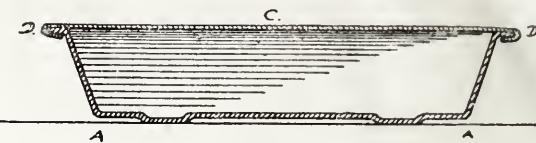
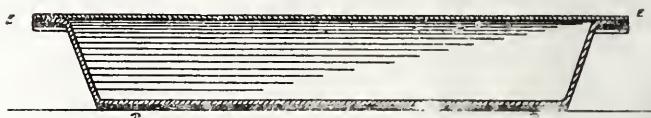


Fig. 2.



veloping dish with the cover applied. In both drawings C is the sliding cover, shown in transverse sections, D D, in fig. 1, and in longitudinal section at E E (fig. 2), A A (fig. 1) being a transverse, and B B (fig. 2) a longitudinal section of the developing dish. The lateral edges or lips of the developing dish, embraced by the downwardly inward portions of the cover will be seen at D D (fig. 1), while the straight of flat ends of the cover, permitting it to be slid on to the edges of this developing dish from either end thereof, will be seen at E E (fig. 2). The direction E E is, of course, that in which this protection cover is to be slid into its position on the dish, shown."

"IMPROVEMENTS" IN PROJECTING PICTURES IN NATURAL COLOURS.

[Krayn's Patent No. 10,000 of 1900.]

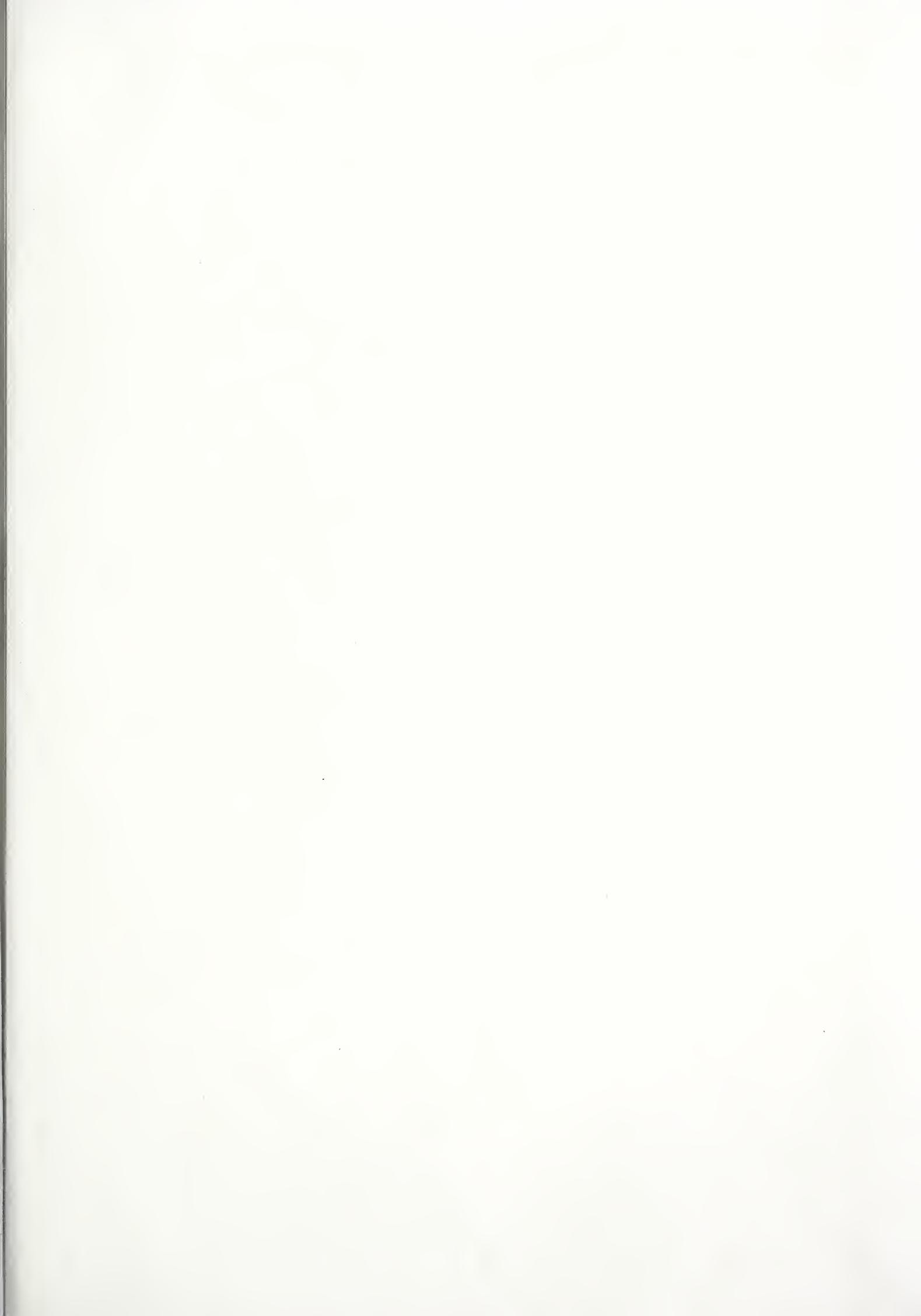
THREE exactly similar photographs are taken through red, green, and blue screens respectively. A diapositive of each of the pictures is then produced, and these three diapositives, with their respective coloured screens, are caused to pass successively in front of an illuminated opening, each picture being momentarily arrested in front of the opening, as in a cinematograph. This may be accomplished by mounting the diapositives upon a disc or wheel which has intermittent angular motion imparted to it by means of gearing similar to that employed with a Geneva stop. The disc may carry three diapositives only, or it may carry six or nine or other multiple. Instead of being mounted upon a wheel the diapositives may be carried by a ribbon which may be similarly intermittently moved. The rapid successive presentation of the three pictures with their coloured screens causes them to appear to be projected or viewed in their natural colours, according to the same law as governs the action of the cinematograph and similar apparatus.

SOFT TRANSPARENCIES FROM HARD NEGATIVES.

[Received too late for the ALMANAC.]

HAVING failed to make lantern slides from several negatives, with strong contrasts, full of detail, but very dense from over-development, the following plan, although entailing a little trouble, was found efficacious. In case of failure, the original negatives are still available, being untouched in any way, not, as in the case of reduction perhaps, irreparably ruined. Place the negative and an ordinary plate film to film in a printing frame, making sure both are hard against one side and end of the frame. Expose as usual in making a transparency, but only carry development far enough to yield a thin transparency. Fix and wash; when dry place the transparency in contact with the negative, that is film to film, and they will be found to coincide, and be in perfect register. When in that position, bind them on one side or end with a lantern-binding strip, although this is not absolutely necessary. Now make the lantern slide or transparency if the negatives is to be reproduced in the camera. Expose first for the dense parts, with the negative and transparency together, cap the lens, remove and fold down the transparency from the negative, and then expose for the thin parts. As an example an exposure of one minute was given for the high lights and two seconds for the shadows.

V. C. BAIRD.









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